



# **Complex Visibles Out There**

Proceedings of the Olomouc Linguistics Colloquium 2014:  
Language Use and Linguistic Structure

Edited by Ludmila Veselovská and Markéta Janebová

Palacký University  
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Language Use and Linguistic Structure

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Ludmila Veselovská  
Markéta Janebová  
Editors

## Introduction

The articles in this volume are based on papers and posters presented at the Olomouc Linguistics Colloquium (OLINCO) at Palacký University in the Czech Republic in June 5–7, 2014. This conference welcomed papers that combined analyses of language structure with generalizations about language use. There were over 90 oral presentations and some 40 posters given at the 2014 OLINCO. The essays here are, we think, representative of the best of the colloquium contributions. All these papers have been doubly reviewed, with one reviewer always external to Palacký University, and revised on the basis of these reviews.

The sections of this volume roughly represent the different sections for papers presented at OLINCO, but the groupings in the Table of Contents have been determined, in the final analysis, by their subject matter rather than by *a priori* areas.

The first text in the proceedings, which appears outside of the thematic sections at the very beginning, is called *Simple Invisibles*, and it is the authorized transcript of the Questions and Answers session with Professor Noam Chomsky after his plenary lecture on the opening day of the OLINCO colloquium. Some of the questions were proposed to him in advance, others are the questions following his lecture and related to its content. We believe that his answers to the latter are able to stand independently and will be of interest to the readers participating in the latest development of the minimalist framework. Noam Chomsky's citation of Jean Baptiste Perrin has provided the title not only for the transcript, but also to the whole proceedings volume.

## Linguistic Structure

The first of the two sections on grammatical structure manifests the strong interest of the conference participants in the properties of categorial projections, especially nominal projections, but also of modifiers and verbs. Some authors address the characteristics of clausal domains including argument structure, object symmetry, and modal verbs. Several papers deal with the left periphery of clauses: topicalized and WH constituents and sentence-initial adverbials. The papers show that current research has been subjecting phrasal structures and attested morphology of several categories to intense scrutiny, including their internal functional domains, and investigating quite theoretical aspects of the labeling procedure during syntactic derivations. All the papers deal with questions that are at the center of how categories behave, including what is usually referred to as the syntax/semantics interface.

## Linguistic Structure: Focus on Slavic

The second part, as its title suggests, puts together the articles dealing with Slavic. The number of contributions proves that the new linguistic generation is

able to apply the current formal linguistic framework to highly inflected Slavic languages. Such an implication appears to be very fruitful and we hope that some hypotheses defended here will inspire a wide range of syntactic researchers and theoreticians. Most of the papers concentrate on nominal projections and various kinds of agreement. Others discuss adjective modification, predicational clauses, and coordination. The first two sections also include several papers focusing on semantic topics—most of these are related to the OLINCO workshop concentrating on indefinites and quantifiers.

### In Search of Structure in Spoken and Written Language

The volume's third section contains papers on a variety of topics. The biggest group contains contributions related to the workshop on the construction and usage of corpora and those dealing with the pragmatics of language use. Several texts discuss the categorial taxonomy and also social connotations of vocabulary choice or syntactic expression. The issues addressed in this section include translation strategies and comparative studies of several European languages. The papers demonstrate that statistical evidence is able to support one alternative theory against another and that when new paradigms are found, they can sharpen the focus of theoretical research.

### Phonetics and Phonology

A fourth group of papers that emerged from the OLINCO workshop are those on phonetics and phonology, especially phonetic aspects of language acquisition process and language learning. One paper discusses age- and gender-related distinctions, another accentual phrase intonation or reduction of stressed vowels by foreign learners of English. Apart from Czech and Slovak phonetics, which are naturally predominant in this section, the contributions also discuss Lombard, Icelandic, European Portuguese, and Taiwanese.

We hope that all readers will find several papers here to be of interest to them, their colleagues, and students. For us, it was challenging but also interesting and even entertaining to organize and participate in the colloquium in person. We hope that this volume will extend the challenges and the results of this linguistics forum to a wider audience. Apart from taking part via the written word of the proceedings, anybody can also consult the conference website at <http://olinco.upol.cz/>. The web of the OLINCO colloquium contains the proceedings and the monograph from the preceding year colloquium OLINCO 2013, the recorded plenary lectures by Professor Chomsky and Professor Adger at OLINCO 2014, and many other data and pictures that may please both those who participated and those who did not.

The goal of the Olomouc Linguistics Colloquium has been to create an internationally recognized center of linguistic research in the Czech Republic,

one that can serve as a hub and an inspiration for broadening such research and integrating it with international currents of this research in Western Europe and the rest of the world. The surprising numbers of foreign abstracts submitted, the astounding percentages of international presenters and participants, and the quality of the resulting published books, the present proceedings included, are clear evidence that this goal has been achieved.

Ludmila Veselovská  
Markéta Janebová  
Editors

## Simple Invisibles: Questions and Answers after Noam Chomsky's Lecture in Olomouc, June 5, 2014

Noam Chomsky

Some questions were prepared and delivered to Noam Chomsky in advance, others came from the audience after the lecture "Problems of Projection: Extensions."<sup>1</sup>

*Q1: According to Chomsky (2013), the linear order of words is only a peripheral part of language. If a constituent's position in the structure changes, it shows in the linear order. However, the order is often the only obvious and non-ambiguous information we use in argumentation. Do you have any suggestions how to avoid this problem?*

**Noam Chomsky:** This is a pretty far-reaching question, and it is one that does not apply just in the study of language. It applies in *all of science* beyond the most trivial level. What you are presented with in science is lot of data. None of it makes any sense—it's a big jumble. And the idea is to try to make some sense out of it.

What you do in the sciences, in the modern sciences at least since Galileo, is the following. There is actually a nice phrase about this in the address of the Nobel Laureate in Physics, Jean Baptiste Perrin, who pointed out that the whole goal of science is to replace complex visibles by simple invisibles. That is science. If you are not doing that, then it is something else, it is data organization, flower collection. Sometimes the latter is useful, but it should not be confused with science. If it is science, since Galileo, it is an effort to satisfy Galileo's maxim: nature is simple. If we have not figured it out, it is our problem.

Data are complex. You get complex visibles; you try to find simple invisibles and that is what science is about. The data that you are presented with does, of course, include linear order. Actually, that is not entirely true. It is true if the modality is sound. If the modality is sign language, you get a more complex system, because in sign you

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1 For the video of the talk, see <http://olinco.upol.cz/>. The text is Chomsky (2014).

have the visual space, a different modality. There are different kinds of arrangements. If you know something about sign, you know how that works. But whatever the modality is, the data are presented in some sensory modality. The same is true of experiments in physics, or biology, or anything else. The data are presented in some sensory modality, and scientific work begins when you take this messy complicated data and you show that there is an account of it, that there is an explanation of crucial aspects of it in terms of simple invisibles. I think, in the case of language, these invisibles do not involve order. I think what you are pointing to in this question is the very definition of science.

Here is a case in point for linguistics. The sensory-motor system has a property of natural motor systems; in a serial articulatory system you cannot talk in parallel and you cannot talk structures. So whatever is going on in your head that is going to come out has to pass through this superficial filter, which requires linear order, and that has nothing to do with language whatsoever. That is a property of the sensory-motor system which was around for hundreds of thousands of years before language ever emerged. Externalization just cannot help passing through one of the sensory-motor systems which presents data that look very messy and complicated. The trick is to show that something internal is going on that explains the data, so I think it's a very important question.

*Q2: It has been stated that one of the main motivations for pursuing the minimalist program is the idea that language constitutes a perfect system in the sense of being as economical as possible. Where is this presupposition coming from, considering that evolution often tends to create structures that are far from perfect regarding their ultimate use?*

**N.C.:** Well, notice that there were two notions here. One is about constituting a perfect system; the other is about a system that is as economical as possible.

In biology, evolution tries to find the system that is as economical as possible and sometimes it turns out to be remarkably close to perfect.

If you take a look at the evolution of various kinds of eyes, it is quite astonishing how perfectly they work. And if you look at the origins of eyes, a fair amount is known about the evolution of the eye, in Walter Gehring's and others' work. There are very few possibilities, it turns out, for all phototropic entities, including probably plants. There are only a couple of ways in which they can work because of the nature of physical law, and it works to yield something with remarkable characteristics. You can pick up one photon of light, and it cannot be more perfect than that.

Sometimes evolution tries to get the most economical system, and it comes out a mess. Actually, everybody knows this. That is why we have back problems. The spine is very badly designed, and apparently it is not just humans. According to neuroscientists who work on it, it is the same for all big mammals. So apparently, cows

have backaches too, but they are not going to complain about them. If you look at the spine and if you think of engineers that would look at the spine, they can figure out much better ways to do it. Moreover, you rather know why from evolutionary history. The spine did not evolve as a way of keeping you upright, not even on four legs. It evolved as a way of protecting a nerve. And evolution cannot do what is called “hill climbing.” It cannot go up a hill and then come down and start over. It has to keep going from where it is. So once the spine evolved to protect a nerve, it just had to do the best it could from then on, which turns out to be a bad job. Nevertheless, evolution is trying to get the most economical systems, and sometimes they are quite perfect, sometimes a mess.

But what about language? Well, as linguists among you know, there is a huge burgeoning field of what is called the “evolution of language.” It is a very strange field for many reasons.

One reason is that languages do not evolve, so there is no such thing as the “evolution of language,” because languages are not organisms—they do not evolve, they change, but they do not evolve. What evolves is Universal Grammar (UG)—the language capacity. Interestingly, most of the people who work in this “evolution of language” field say that UG does not exist. I do not know how they reconcile that, because that is the only thing that can evolve—the capacity for language.

The other reason why it is strange is there are basically only two facts known about the evolution of the language capacity. One of them is known with a high degree of confidence; the other is a kind of speculation.

We have a high degree of confidence that there has been no evolution of the language capacity at all since our ancestors left Africa. All humans seem to have the same language capacity. If you take a child from a tribe in Papua New Guinea and raise it here, it will be indistinguishable from a local child and conversely. There do not seem to be group differences in cognitive capacity; there are some individual differences, but not in groups. If there is anything, it is extremely marginal. Therefore, whatever this thing is, it has not evolved for at least roughly fifty, sixty, seventy thousand years.

However, if you go back to nearly fifty thousand years before that, there is no evidence that language existed at all. That is the second fact. The second fact is that in the archeological record (you obviously do not have tape recordings) there is what paleo-anthropologists call a Great Leap Forward—big changes that seem to take place pretty suddenly. They were roughly around 75,000 years ago. And what you find in the record is, for example, elaborate tool making. The Neanderthals, the last living non-human hominid, had extremely complex tools. In fact, so complex that modern humans can only duplicate them with instruments. But they are all the same, no matter where the Neanderthals were. Over a couple of hundred thousand years they made the same tools, identical, and there was no creativity. Whatever happened, they made a tool and that was it, and the same is true in other domains.

Starting around 75,000 years ago, you suddenly get a burst of creativity in things like tool making and lots of other things. You get the beginnings of symbolic art, representation, and it shows up really dramatically with Cro-Magnon, in sites like Lascaux and so on. That is fantastic, and that is what led Picasso to say that the Cro-Magnon hominids invented everything that we know. I actually got into the Lascaux caves before they were closed off some 60 years ago and it was amazing.

What you do get is the beginnings of symbolic art. You get complex social structures, which you can tell from the archeological remains. You get recording of astronomical events, and quite a lot of things happened. It is generally assumed that the cause that led to this was the emergence of language. It is hard to imagine any of this happening without language. Therefore, there is a guess, a plausible guess that language probably emerged suddenly, roughly at that time.

When you think about the numbers, what it tells you is that language emerged suddenly and it never changed. There is no later evolution. Those numbers are very small in evolutionary time. If you want some details about this, have a look at some current books like that of Ian Tattersall, one of the main paleoanthropologists. He has a recent book called *Masters of the Planet*, which summarizes what we know today. That seems to be essentially the picture.

But if anything like this is true, it follows almost instantly that what emerged was very simple: some slight rewiring of the brain or some small mutation, which would have had no selectional pressures at all because it would happen in one person, because mutations do not take place in a group. The form that it would take would just follow from natural law, and it might look complicated. Let us say, a snowflake looks complicated but because it follows from natural law there's no selectional pressures on snowflakes. That is a case of complex visibles and simple invisibles. If we finally figured out the natural laws, language should look like that, so I think this is a motivation for guessing that language ought to be extremely simple.

There are other reasons which I mentioned, like the fact that it is almost entirely unlearnable, contrary to what is claimed. Every effort to try to show that something can be learned, except very superficially, has just collapsed. Moreover, any of the kinds of things I mentioned are totally unlearnable, even simple things like structure dependence and so on, and essentially everything about semantics, and even word meaning, when you think about it. So language looks unlearnable; it looks as if it has no analog elsewhere. There is nothing in the animal world that even remotely resembles the basic principles of language.

It is hard to see how that can be the case, unless in fact it is really very economical. But the task is to show that what ought to be the case is the case. That is the standard problem of the sciences.

*Q3: Which theories of lexical primitives and the phonological form interface do you think are the most promising? In particular, do you favor Distributed Morphology, Nano-syntax, neither, aspects of both, or some other approach?*

**N.C.:** I feel that it is mostly an open question, at least for me. But I think there is a type of Distributed Morphology which I hear a lot about, because its inventor is in the office right next to me. There is a rich, very rich version and there is a more restricted version.

The richer version is Alec Marantz's, where there is basically nothing, no phonetics at all, except that all the phonetics is introduced at some peripheral level. The whole syntactic computation all through phonology in fact just deals with formal features. That poses a problem that he deals with.

The problem is how do we know that thing that comes out "cat" means "cat"—why doesn't it mean "dog," let's say. The standard way of answering this is because of the lexicon, where you have both of them together. But in this rich version of Distributed Morphology you do not, because the phonetics is only coming into the derivation later on. Then, there is some story about how you put them together, which I don't find very convincing. That is the rich theory of Distributed Morphology.

There is a narrower theory which seems to me much more plausible. To be specific, we can take English. The morphology only permits a certain number of slots; there are very few slots that you are allowed to fill, and sometimes you get competition. So for example in the past tense of a verb, you have only one slot and two features: tense and number. You cannot get them both in because there is only one slot. So naturally you pick tense because number is redundant. That is another form of Distributed Morphology, and that I think is very plausible and it generalizes to a lot of cases.

*Q4: What do you see as the biggest contribution of the Minimalist Program? Do you think it is necessary or useful in moving generative linguistics forward?*

**N.C.:** First of all the so-called Minimalist Program is just a seamless continuation of what has been done from the beginning in the 1950s, or actually in the late 1940s when I wrote my undergraduate thesis.

The main goal was to try to get the simplest possible formulation, for normal scientific reasons. Simplicity is essentially the same thing as explanation. The fewer stipulations and assumptions you have, the deeper your explanations. That is why science aims to try to get things as simple as possible and to make the explanations as far-reaching as possible. Every step has been like that.

Take the early work in the 1950s. I assumed that the infinite generative capacity was in the transformational component. Based on some observations of Charles Fillmore, it turned out that you can get a simpler analysis if you put it into the base

component. So that was the change. That is the difference in this respect between *Syntactic Structures* and *Aspects of the Theory of Syntax*.

And that is just one attempt to find deeper explanations with simple proposals. And everything, for example X-bar theory, is the same. A phrase-structure grammar was sort of abandoned, I think correctly, in the 1960s, because it was way too complicated. Why do you have  $VP \rightarrow V - NP$ , but why do you not have  $VP \rightarrow P - CP$ , or something else? A phrase structure grammar is all stipulated.

That was eliminated by X-bar theory, which, however, introduced a mistake, I think. Namely endocentricity, and that was a bad mistake, and we need to revise it. But there was an effort to make theory simpler all the way through.

But the Minimalist Program just goes on with that, so it is just part of the normal effort to try to develop a science of language as distinct from data collection, which is something you can always do. There is one innovation in the Minimalist Program, which kind of led to its name. It suggests a different research program. By the early 1990s, a number of people (I was one of them, Michael Brody was another, with a couple of other people) had a feeling that enough has been learned, so that we can try something more ambitious. The more ambitious thing would be sometimes called "approaching UG from below."

Start by assuming that you have the simplest possible language, the simplest possible system, and see how far you can go. If somebody around here were in courses of mine in the 1980s you may remember that every advanced class began by saying, let's see what the simplest possible system would be, and then let's try to build from there. It always collapsed. We went a little bit further, and then it just got hopelessly complicated.

By the early nineties, it seemed that was getting better. You know that you could actually continue quite a distance by approaching UG from below. That is the Strong Minimalist Thesis.

But that is a research program. Research programs are not true or false. There is a very funny theme in the literature, which I notice all the time, of people having refutations of the Minimalist Program, or arguing that the Minimalist Program is not minimalist enough, or various other things. All of this is totally meaningless. You cannot say that about research programs. You can say that a research program is premature, or ill-conceived, and other things, but it cannot be true or false. This is just incoherent.

The question you have to ask is: is it a research program that is productive? These works I am talking about are simply efforts to show that it can be productive, it can explain things. And how far can it go? Well, I think there are some reasons to believe, the ones I mentioned, that it should be able to go all the way, because of the evolutionary reasons that I mentioned. But that is a hard task. There are an awful lot of the complex visibles out there, as everyone who works on language knows.

*Q5: I wanted to ask whether there is an ontological difference between Pair-Merge and Set-Merge.*

**N.C.:** Set-Merge is just essentially set formation. Pair-Merge is pair formation. It is different from Set-Merge, first of all formally. It's the next most complicated operation.

The simplest operation is set-Merge, which forms sets. The next most complicated operation would form pairs, that is, make the sets asymmetric. There are things in language that look asymmetric, like for example adjective modification. The result of adjective modification is still nominal. So, it looks like the adjective is asymmetrically connected to the noun.

Now there are further reasons for this. You can put arbitrarily many modifying phrases on a noun. You can have a sentence "The man was tall," or take more predicates and you get "The tall angry man tired of his job . . . ," on and on endlessly. That has always been a problem in generative grammar from the beginning, because you cannot have phrase structure rules which extend indefinitely without any internal structure. But still these things can be added. They may have an internal structure, but they do not have to. You get unstructured sequences of modifiers of arbitrary length, and there are not any phrase structure rules, no matter how rich the system, that can produce that. You go back and there are papers by Howard Lasnik and other people who try to deal with this. Nevertheless, the obvious way to deal with it is to simply suppose that these modifiers are asymmetrically assigned to the Head, and that you can keep asymmetrically assigning them indefinitely. You can have indefinitely many relative clauses attached to a noun, let's say, and indefinitely many adverbs attached to a verb. All of these things look like asymmetric operations, because if you attach an adverb to a verb it is still verbal, and they are kind of ignored in formulations of how the syntactic operations work. Probably Head-movement is like this is well, except I think that it is the opposite of the way it has always been described. So for sure, there is no ontological difference. They are just different operations, and one of them introduces asymmetry, while the other does not.

*Q6: This is just a question about the complexity of the lexical element T (Tense). You propose that T can be parameterized to be weak or strong. With weak T, T is unable to label. Yet, T in English also has some phi features on it, which are visible for the labeling algorithm when there is something in a specifier. So I think I do not quite understand how the information is organized so as to achieve that result.*

**N.C.:** Well, I am assuming Rizzi's story that in the null-subject languages the inflectional elements, what I call T here, are inherently rich. In English-type languages, they are empty. In English, the weak T has basically no properties. It will become tensed if it is in a CP. It will be non-tensed if it is in an infinitive. It will have whatever features

the C tells it to have. And once those features are inherited, the T itself simply still remains weak, despite having those features. Therefore, it alone cannot label. If there is a specifier around, you get the phi labeling. If you put it metaphorically, T is kind of strengthened by the presence of the strong features in the specifier. Then you get the two of them paired, and you get a label. The same with the Root, except that the Root is always weak. It does get features from V\*, but it is still weak, so unless the specifier is there, there's no label. That is the idea.

*Q7: I was wondering if you can clarify a bit this C-deletion operation. I understand that it has to be there to have its features inherited and then go away. But what kind of operation do we have that can get rid of something from the structure? That is not the sort of thing you can get from Merge.*

**N.C.:** No, that is a deletion operation. It is probably an idiosyncratic operation, which says to take away something. The C has intrinsic properties like Force, like “I am a clause, I am an imperative,” or something, and there has got to be some operation that says “lose this property.” I mean it is the kind of operation that we see all the time in phonology. And the question is: can you have an idiosyncratic counterpart to it in syntax? Probably so. I think it is not the only deletion operation, but yes, that is kind of like copy deletion, except in the syntax.

*Q8. Have I sensed an implication that perhaps infinitives at least in the standard type of infinitives are not CPs at any level?*

**N.C.:** Well, I am assuming that there are infinitives that are CPs, like in English the *for-to* infinitives, but others like, let's say, Exceptional Case Marking cases are not CPs. In fact it is probable that the T there, that the T itself, may have no properties at all. Then the question is: why would T exist if it has no properties at all? And I think a possible plausible answer to that is that the features of C, the unvalued features of C, cannot stay there for Mark Richards's reasons—they have to go somewhere. Otherwise you get crashes, and they cannot go to V\* because V\* already has features, so there has to be something in between that is going to pick up their features and maybe that is all that T is.

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# **Linguistic Structure**



# English *-ly* Adverbs as PP Compounds

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**Abstract:** This paper addresses the question of whether *-ly* adverbs in English are a separate category or belong to some other lexical class. It discusses the arguments for the standard approaches to adverbs, according to which they either constitute an independent lexical class or form a major single category with adjectives, and presents further data that are problematic for both approaches. These data suggest instead that *-ly* is a nominal morpheme, rather than a suffix, and, on the basis of these data, *-ly* adverbs are proposed to be null-headed PPs containing the dummy noun *-ly* that is modified attributively by the base adjectives of adverbs.

**Keywords:** category of adverbs; *-ly*; inflection vs. derivation; complementary distribution.

## 1. Introduction: Adverbs as a Category

The question of whether adverbs in English constitute a lexical category does not have a well-established answer.<sup>1</sup> The main reason for this is the fact that the predominant majority of English adverbs are derived from adjectives and share with them a significant number of properties; moreover, adjectives and adverbs are in systematic complementary distribution. These facts make it tempting not to distinguish a separate lexical category of adverbs in English, assuming that deadjectival adverbs and adjectives are syntactically conditioned variants of a single major category (Emonds 1976; 1985; Sugioka and Lehr 1983; Bybee 1985) and that the remaining non-deadjectival adverbs, which are not numerous, can be reanalyzed as belonging to other categories. This view, thus, implies that *-ly* is an *inflectional* suffix on the category A.

Nevertheless, attractive though the single category theory is, it is not the predominant view. Rather, it is quite standard to assume that adverbs form a separate lexical

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<sup>1</sup> I would like to thank the audiences of OLINCO 2014 (Olomouc, Czech Republic) and WAASAP 2 (Tromsø, Norway) and an anonymous reviewer for their helpful comments.

category distinct from that of adjectives and that *-ly* is, thus, a category-changing *derivational* suffix that makes adverbs out of adjectives (Zwicky 1995; Payne et al. 2010).

However, there are a number of further facts that are difficult to explain either on the inflectional or the derivational analysis of *-ly*, but follow straightforwardly if *-ly* is analyzed as a *nominal* morpheme and not a suffix (Déchaine and Tremblay 1996; Baker 2003). This paper presents further data that speak in favor of the nominal analysis of *-ly* and, on the basis of these, argues that *-ly* adverbs are null-headed PPs that contain the dummy noun *-ly* modified attributively by the base adjective. Thus, according to this analysis, adverbs do not constitute a separate category, but neither are they in the same single category as adjectives. Furthermore, this paper shows that the PP analysis also accounts for the facts that have been interpreted as evidence for the single category theory.

The structure of the paper is as follows. The central arguments for the inflectional analysis and the counterarguments to them, used in favor of the derivational analysis, are discussed in Sections 2.1 and 2.2. Section 3.1 presents the data that speak in favor of the nominal analysis of *-ly*; on the basis on these, Section 3.2 puts forth the analysis of *-ly* adverbs as PPs, and Section 3.3 shows that this analysis also accounts for the facts that have been interpreted as evidence for the inflectional analysis. Section 4 concludes the paper.

## 2. The Suffixal Analyses

### 2.1 The Inflectional Analysis

The fundamental difference between adjectives and adverbs concerns the range of categories they can modify and the ability to occur predicatively, and in both respects they are in complementary distribution. Adjectives are noun modifiers and can be used in the predicative position; adverbs modify non-nouns (verbs, adjectives, other adverbs, and prepositional adverbials) and cannot occur predicatively.

- (1) (a) a {painful/\*painfully} wound  
 (b) injure {\*painful/painfully}  
       {\*painful/painfully} honest  
       {\*painful/painfully} slowly  
       {\*painful/painfully} behind the times
- (2) This wound is {painful/\*painfully}.

The complementary distribution of adverbs and adjectives has served as an argument in favor of their belonging to a single category, as elements in complementary distribu-

tion are typically analyzed as subclasses of the same distributional class (Radford 1988, 139–41).

It has also been argued that the single category theory receives support from a number of other facts. First, adjectives and *-ly* adverbs permit the same range of degree modifiers, including those that form *analytic* comparatives and superlatives (Emonds 1976, 12–13; Emonds 1985, 162):

- (3) very/so/too/quite/rather/more/most  $\left\{ \begin{array}{l} \text{painful} \\ \text{painfully} \end{array} \right\}$

Second, *-ly* adverbs do not form *synthetic* comparatives and superlatives in cases where it should be possible morphophonologically and semantically. This fact is unexpected if *-ly* is a derivational suffix. More precisely, it is unclear why degree morphology cannot attach to *-ly* (*\*quicklier*); the inability of *-ly* to attach to *-er/-est* (*\*quickerly*) is predictable, since derivation precedes inflection in English. By contrast, if *-ly* is an inflectional suffix, it can be argued that *-er/-est* and *-ly* are mutually exclusive, both being inflectional, because English allows only one inflectional suffix per word (Hockett 1958, 210).<sup>2</sup>

- (4) (a) *\*quicklier*/*\*quickerly*  
*\*quickliest*/*\*quickestly*
- (b) *\*nicelier*/*\*nicerly*  
*\*niceliest*/*\*nicestly*

Third, adverbs formed with *-ly* never participate in further derivation by suffixation (Plag and Baayen 2009), cf. *\*quicklyish*, *\*quicklitude*, *\*quickliment*, etc., cited in Payne et al. (2010, 62). If *-ly* is an inflectional suffix, this fact receives a straightforward explanation insofar as derivational morphology does not apply to inflected forms; on the derivational analysis it remains unexplained.

However, despite these arguments for the single category theory, the predominant view is that adverbs constitute an independent lexical class. For one thing, intuitively, *-ly* is not a typical inflectional affix, although the distinction between inflection and derivation is admittedly not clear-cut beyond the core cases. For another, the arguments for the single category theory have been countered, most recently and systematically by Payne et al. (2010). Section 2.2 gives a brief summary of their replies, specifically those to the arguments discussed above.

<sup>2</sup> Interestingly, adverbs can form synthetic comparatives/superlatives by means of *-er/-est* if *-ly* is deleted (i.e., identically to the comparatives/superlatives of adjectives); cf. Section 3.1.2 for a discussion.

## 2.2 The Derivational Analysis

Concerning the fact that adjectives and adverbs share the set of degree modifiers, Payne et al. (2010) point out that some of these modifiers can also co-occur with members of other categories; e.g., *enough*, *more*, and *less* can also modify gradable verbs, while *so*, *as*, and *too* can also modify PPs (*feel so out of sorts*, *be too over the moon*). This, in their view, shows that the similarity between adjectives and adverbs with respect to degree modifiers is a less strong argument for their belonging to a single major category than usually thought, as other categories permit some of these modifiers as well. It is not clear, however, to what extent this consideration is a counterargument, since what has been used as evidence in favor of the single category theory is the fact that adjectives and adverbs share *all* their degree modifiers and no other category permits exactly the *same* range of degree modifiers (Emonds 1976, 13).

With respect to the facts that *-ly* adverbs do not take degree morphology and do not allow further derivation by suffixation, Payne et al. (2010) object that some derivational suffixes are also incompatible with degree morphology, e.g., *-ic*, cf. *\*basicer* (Zwicky 1995), and that some derivational suffixes also resist further derivational suffixation, e.g., *-ism*, as in *humanism* (Plag and Baayen 2009). These are valid objections, but they do not shed light on *why* the suffix *-ly* behaves in this way as a derivational suffix, even if there are other derivational suffixes that behave in the same way, i.e., as closing morphemes, while the inflectional analysis provides an *explanation* for these facts.

Further, Payne et al. (2010) also argue against the claim that adjectives and adverbs are in complementary distribution. In particular, they present data that demonstrate, on the one hand, that adverbs can *post*-modify nouns, even if they cannot *pre*-modify them, and, on the other hand, that adjectives can modify other adjectives. Some of Payne et al.'s numerous examples of both phenomena are given below.

- (5) (a) In view of your decision regarding Burma the British Government was not making any formal request to you for [the **use temporarily** of Australian troops to defend Ceylon].
- (b) Public awareness of the low birthweight problem is heightened by [the **release periodically** of major reports by a variety of public and private organizations interested in maternal and child health].
- (c) [The **winner recently** of both a Gramophone award and the Royal Philharmonic Society Award for Best Chamber Ensemble], the Endellion Quartet is renowned as one of the finest quartets in the world today.
- (d) During the early 1990s [a timber **shortage internationally**] led to an increase in timber prices and export opportunities for premium timber grades.

(6) (a) blind drunk, cold sober, filthy rich, dead easy, pretty fine, bloody stupid

(b) dark red, light red, brownish red, bright blonde, pale blonde, silvery blonde

The ability of *deverbal* event nominalizations, such as *use* and *release* in (5a) and (5b), to take post-nominal VP-adverbs has been argued by Fu et al. (2001) as testifying to the presence of a VP in their internal structure. Payne et al.'s (2010) important further observation in this connection is that it is not only deverbal nouns that can take post-nominal adverbs, but also non-deverbal ones, such as *winner* and *shortage* in (5c) and (5d). Since such nouns cannot be assumed to contain verbal projections in their internal structure in view of their non-deverbal origin, adverbs that modify them post-nominally must be analyzed as adjuncts to the NP itself.

If correct, the data in (5) and (6) make a strong case against the single category theory because they show that adjectives are not exclusively noun modifiers and adverbs are not exclusively non-noun modifiers. The robustness of these data does not seem to be indisputable, though.<sup>3</sup> Nevertheless, I will not go into any discussion of how solid these data are, as the approach to adverbs advocated in this paper is *not* the single category theory and, hence, it does not presuppose the complementary distribution of adverbs and adjectives.

The motivation for the approach to adverbs advocated in this paper will be presented in Section 3.1. In particular, I will discuss a number of facts which are difficult to explain by both the inflectional and derivational analysis of *-ly*, but follow automatically if *-ly* is analyzed as a *nominal* morpheme, rather than a suffix. On the basis of these facts, it will be argued in Section 3.2 that *-ly* adverbs are null-headed PPs that contain the dummy noun *-ly* modified attributively by the base adjective.

Since it will not be argued that adjectives and adverbs are positional variants of a single category, their complementary distribution, whether real or not, will not play a role as an argument in what follows. However, the fact that adverbs cannot pre-modify nouns and Payne et al.'s (2010) data showing that adverbs can post-modify nouns fit well into the PP analysis of adverbs, as PPs can post-modify, but cannot pre-modify, nouns.

<sup>3</sup> Payne et al.'s (2010) claim about adverbial post-modification of nouns may be argued not to be based on very solid data because the majority of their examples involve deverbal nouns, whose adverbial post-modifiers may be analyzed as modifying verbal projections in their structure, and among the remaining examples with non-deverbal nouns many contain domain adverbs, whose attachment site may be disputable as a result of their flexible syntactic positioning (Ernst 2002). Regarding the examples of adjectival modification of adjectives, it may be objected that they are idiosyncratic stable collocations belonging to restricted semantic classes (metaphoric expressive modifiers, color modifiers). For example, what look like adjectival modifiers may be argued to be adverbs that idiosyncratically take the form of adjectives. Modifiers of color adjectives may alternatively be argued to be nouns.

(The data concerning adjectives modifying adjectives are orthogonal to the PP analysis of adverbs, as they make a contribution to the understanding of the syntactic selectional restrictions of adjectives, but have no bearing on adverbs.) Moreover, the PP analysis also accounts for the facts that have been interpreted as evidence for the single category theory, as will be shown in Section 3.3.

### 3. The PP Analysis

#### 3.1 The Nominal Nature of -ly

Diachronically, the English -ly derives from a noun, namely, from the Proto-Germanic \*-liko- “body,” being similar in this respect to -ment(e) in Romance languages, which goes back to the Latin *mente*, the ablative form of the feminine noun *mens* “mind.” This fact in itself can hardly be an argument for the nominal nature of -ly synchronically. However, there is evidence that -ly also continues to display nominal features in modern English, while the base adjectives of -ly adverbs continue to display features of attributive adjectives inside adverbs, as shown, among others, by Déchaine and Tremblay (1996) and Baker (2003, § 4.5). This evidence, the main points of which will be summarized and further developed below, implies that -ly adverbs are adjective + noun compounds and not adjective + suffix forms.

##### 3.1.1 Complements of Adverbs

An important argument in favor of the nominal analysis of -ly has been put forward in Baker (2003, 234–35). This argument comes from the fact that -ly adverbs pattern with (pre-nominal) *attributive* adjectives in not being able to take prepositional, sentential, or infinitival complements, differently from *predicative* (and post-nominal) adjectives, as the examples in (7) demonstrate. Note that what is relevant in this case is the inability of attributive adjectives to take complements that are placed *post-nominally* rather than immediately following them, i.e., their inability to form *split*, or *discontinuous*, APs.

- (7) (a) \*proud-**ly** of his daughter  
       \*a proud **man** of his daughter
- (b) a man proud of his daughter  
           This man is proud of his daughter.

This parallelism between -ly adverbs and attributive adjectives (that is, only a positional variant of adjectives, rather than adjectives in general) with respect to their inability to take complements is surprising both on the derivational and inflectional analysis of adverbs. By contrast, it follows straightforwardly on the analysis of -ly as a nominal morpheme which is modified attributively by the base adjectives of adverbs.

At present, there is no well-established explanation of the inability of attributive adjectives in English to take complements, which is a manifestation of the Head-Final Constraint on modifiers (Emonds 1976; Williams 1982; González Escribano 2004). But, unlike the suffixal analyses, the nominal analysis of *-ly* at least eliminates the need for a separate explanation for the inability of adverbs to take complements, which is in fact missing as well, by reducing it to the inability of attributive adjectives to take complements.<sup>4</sup>

However, this argument by Baker for the nominal analysis of *-ly* may be objected to on the ground that the generalization that adverbs cannot take complements is in fact not correct. Indeed, it has many counterexamples, such as the following ones:

- (8) Unfortunately for our hero, Rome burned. (based on Jackendoff 1977, 78)
- (9) John succeeded independently from our efforts. (based on Alexiadou 1997, 5)
- (10) Similarly to what Bob postulated, the shape of the universe seems to be muffin-like. (Ernst 2002, 30)

Déchainé (1993, 70) also cites the following complement-taking adverbs, which are used predominantly in *legalese*:

- (11) agreeably to, comfortably to, concurrently with, conditionally on, inconsistently with, differently from, preferably to, previously to, subsequently to, suitably to

In fact, however, the inability of attributive adjectives to take post-nominal complements is not unexceptional either, as shown, e.g., in González Escribano's (2005) study of discontinuous APs. Moreover, complement-taking *-ly* adverbs derive precisely from adjectives that can take post-nominal complements when used attributively, as will be demonstrated below, which further strengthens Baker's argument for the nominal nature of *-ly*.

First, the adjectival counterparts of the complement-taking adverbs in (8)–(10) can all form discontinuous APs, as the following examples show:

- (12) It's been a very **unfortunate episode for** all concerned. [BNC:HGM:1881]

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<sup>4</sup> Travis (1988) argued that adverbs cannot take complements because they do not project to a phrasal category, but remain as heads. However, the head analysis of adverbs is problematic insofar as adverbs can take modifiers and sometimes even complements, as will be discussed below (cf. Alexiadou 1997, § 2.3.2).

- (13) That stance reflects growing concern in Central America about the mounting cost of the drug war, which is prompting some leaders to take a more **independent line from** the United States.<sup>5</sup>
- (14) Along a different line of thought, Sherrington had thus reached **similar conclusions to** those of Pavlov in his famous conditioning experiments. [BNC:AMG:422]

Further, the same holds for the base adjectives of Déchaine's adverbs in (11); in fact, some of them occur among González Escribano's (2005, 566) examples of felicitous discontinuous APs, given below.

- (15) a subsequent article to Chomsky's  
 a previous version to this one  
 a preferable solution to Chomsky's  
 an alternative view to Chomsky's  
 an analogous hypothesis to Abney's  
 a comparable situation to ours  
 a different view from yours  
 an equivalent idea to that  
 a separate room from ours

Finally, the adverbial counterparts of the remaining adjectives in González Escribano's list above can take complements as well:

- (16) **Alternatively to** the above process, if you exactly know what you're after, then simply enter the product name and select the branch in the boxes at the left.<sup>6</sup>
- (17) Whilst Chomsky's major achievement was to suggest that the syntax of natural languages could be treated **analogously to** the syntax of formal languages, so Montague's contribution was to propose that not only the syntax but also the semantics of natural language could be treated in this way.<sup>7</sup>
- (18) The Soviet Union did not admit until 1971 that Gagarin had ejected and landed **separately from** the Vostok descent module.<sup>8</sup>

5 <http://vancouverdesi.com/news/guatemala-blames-washington-for-boycott-of-drug-summit/>.

6 Metroll, 2009 *Metroll—Your Building Solutions Partner*, available online at <http://www.metroll.com.au/home/index.php>.

7 Ted Briscoe, 2011, "Introduction to Formal Semantics for Natural Language," available online at <http://www.cl.cam.ac.uk/teaching/1011/L107/semantics.pdf>.

8 "Vostok 1," *Wikipedia*, available online at [http://en.wikipedia.org/wiki/Vostok\\_1](http://en.wikipedia.org/wiki/Vostok_1).

Thus, the parallelism between *-ly* adverbs and only attributive adjectives with respect to the ability/inability to take complements remains unexplained on the suffixal analyses of *-ly*, but is straightforwardly accounted for by the nominal analysis. The sections below present several further arguments for the nominal analysis of the English *-ly*, which build upon similar arguments made for the nominal analysis of the Romance *-ment(e)*.

### 3.1.2 Degree Morphology

Some Romance languages, including Italian and Spanish, have an *absolute superlative*, which is formed synthetically by means of the affix *-issim-/ísim-*. Interestingly, instead of attaching to the adverb stem, i.e., to *-mente*, this affix attaches to the (uninflected) adjective stem, as illustrated for Italian below.

- (19) *lent-issim-a-mente* / \**lent-a-ment-issim-o*  
 slow-SUP-FEM-mente / slow-FEM-mente-SUP-MASC  
 “very slowly”

The fact that the (inflectional) absolute superlative suffix attaches to the base adjective of an adverb is problematic for the derivational analysis of *-mente* because it implies a violation of the derivation-before-inflection principle. Yet it follows straightforwardly from the analysis of *-mente* as a nominal morpheme that is modified attributively by the base adjective, since degree morphology can attach to adjectival, but not nominal, stems.

In the light of this fact, adverbial comparative/superlative formation in English can now be reconsidered as well. Synthetic comparatives/superlatives of adverbs cannot be formed in English by attaching degree morphology to *-ly* (\**quicklier*), as discussed in Section 2.1. Interestingly, however, they can be formed by attaching degree morphology to the adjective stem after *-ly* has been deleted, as in *quicker*, the comparative form of *quickly* (Sugioka and Lehr 1983; Zwicky 1989; 1995). An overview of the available and unavailable comparative forms of *quickly* is given below.

- (20) Children learn {more quickly/**quicker**/\**quicklier*/\**quickerly*} than adults.

Thus, English differs from Spanish and Italian with respect to the formation of synthetic comparatives/superlatives of adverbs less than may seem at the first glance. Unlike Italian or Spanish, English does not allow degree morphology to intervene between the base adjective and *-ly* (\**quickerly*). Yet, like these Romance languages, it can form comparatives/superlatives by attaching degree morphology to the base adjective; the difference is only that in English *-ly* must be deleted (or have a zero allomorph) in this case.

This phenomenon, which has not received much attention in the literature, is difficult to explain under the derivational analysis of *-ly*. In particular, it is unclear what disallows degree morphology to attach to the adverb stem and it is surprising that, in order to attach to the adjective stem instead, *inflectional* degree morphology is able to alter the adverb stem, deleting that very *derivational* suffix which is supposed to form adverbs as members of an independent lexical category.

The nominal analysis of *-ly* offers, by contrast, a straightforward explanation for this phenomenon. Although it does not explain why English differs from Italian or Spanish in not allowing degree morphology to intervene between the base adjective and *-ly* without deleting the latter, it accounts for the inability of degree morphology to attach to the noun *-ly* and for the fact that *-ly* attaches to the base adjective instead.

### 3.1.3 Deletion under Coordination

Another argument for the nominal analysis of the Spanish *-mente* comes from the fact that it can delete under coordination, as the examples below from Zagana (1990) demonstrate.

- (21) (a) *inteligente y profundamente*  
 “intelligently and profoundly”
- (b) *directa o indirectamente*  
 “directly or indirectly”

Since Spanish does not allow eliding suffixes of either type, but allows the elision of heads of non-final compounds in coordinations of endocentric compounds with an identical head, *-mente* patterns together with the head constituents of compounds and not with suffixes with respect to deletion under coordination (see the discussion in Zagana [1990]). This suggests that adverbs formed with *-mente* are compounds as well and that *-mente* is a root rather than a suffix.

Déchainé and Tremblay (1996) note that this phenomenon does not exist in English and French; indeed, a coordination of two *-ly* adverbs with an elided *-ly* in the first part is generally not acceptable (*\*intelligent- and profoundly*). In fact, however, deletion of the first *-ly* in adverb coordination is sometimes possible, e.g., in phrases such as *direct and/or indirectly* and *fortunate or unfortunately*, which are well attested on the web.

- (22) Precisely because science deals with only what can be known, **direct or indirectly**, by sense experience, it cannot answer the question of whether there is

anything—for example, consciousness, morality, beauty or God—that is not entirely knowable by sense experience.<sup>9</sup>

- (23) **Fortunate, or unfortunately**, depending on which side you are on, property division includes the division of debts, and the Court is required to make an equitable division of all marital property and all marital debt.<sup>10</sup>

These examples show that the deletion of *-ly* under coordination is possible in English, which, to my knowledge, has not yet been acknowledged in the literature. Clearly, it is not as general and productive as the deletion of the Spanish *-mente*, being acceptable only in a restricted range of phrases, given a certain level of style. However, even in this case, *-ly* contrasts with both derivational and inflectional suffixes in English, which can never be elided in a similar way, cf. (24).

- (24) (a) \*industrializ- and modernization

(b) \*tall- and stronger

- (25) black- or whiteboard

Head constituents of compounds, by contrast, can undergo deletion under coordination in English, cf. (25). Thus, in this respect, *-ly* behaves like a root and not a suffix, which suggests that it is itself a root.

Given the above arguments that *-ly* adverbs are compounds that contain the nominal morpheme *-ly* and the base adjective as its attributive modifier, the next section discusses the internal structure of *-ly* adverbs in more detail.

### 3.2 The Internal Structure of *-ly* Adverbs

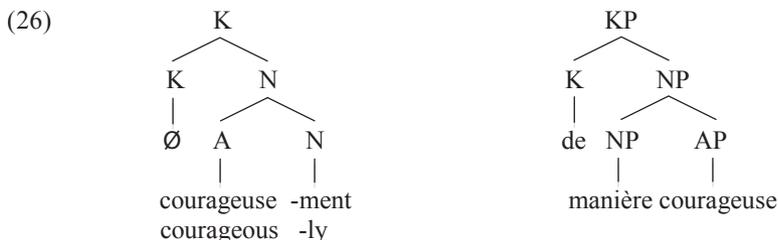
If *-ly* is a nominal morpheme modified attributively by the base adjectives of adverbs, the question is what adverbs are as a whole. They cannot be compound nouns, since adverbs do not have the distribution of nouns, as Torner (2005, 120–21) justly points out, using it as an argument against the nominal analysis of the Spanish *-mente*. Yet the nominal analysis of *-ly* does not necessarily imply that *-ly* adverbs are adjective + noun compounds; they may also be null-headed PPs that contain adjective + noun phrases. The latter kind of analysis will be pursued in this paper. And since it is similar to the

9 Gary Gutting, 2012, “Can Physics and Philosophy Get Along?,” *New York Times*, May 10, available online at <http://opinionator.blogs.nytimes.com/2012/05/10/can-physics-and-philosophy-get-along/>.

10 “Nashville Property Division in Divorce,” *Turner Law Office*, available online at <http://www.turnerlawoffices.com/property-division/>.

analysis proposed by Déchaine and Tremblay (1996), but differs from it in a number of respects, I will first outline their proposal.

Focusing on French and English *manner* adverbs, Déchaine and Tremblay (1996) argue that *-ly/-ment* adverbs can be analyzed as  $X^0$  counterparts of French adverbials of the form *de manière AP*. Accordingly, their internal structure is suggested to be as follows:<sup>11</sup>



Déchaine and Tremblay (1996) assume that *-ly/-ment* adverbs contain a semantically vacuous null Kase head (Lamontagne and Travis 1986; 1987), which accords with the diachronic fact that the Latin *mente* is Case-marked (ablative). Further, following Travis (1988), they assume that *-ly/-ment* adverbs are heads and not maximal projections like prepositional adverbials, as this is supposed to account for the fact that prepositional adverbials are generally post-verbal, whereas *-ly* adverbs can occur both pre- and post-verbally, cf. the examples below from Jackendoff (1977, 73).

(27) (a) Bill dropped the bananas {quickly/with a crash}.

(b) Bill {quickly/\*with a crash} dropped the bananas.

The analysis offered in this paper differs from Déchaine and Tremblay's in the following respects.

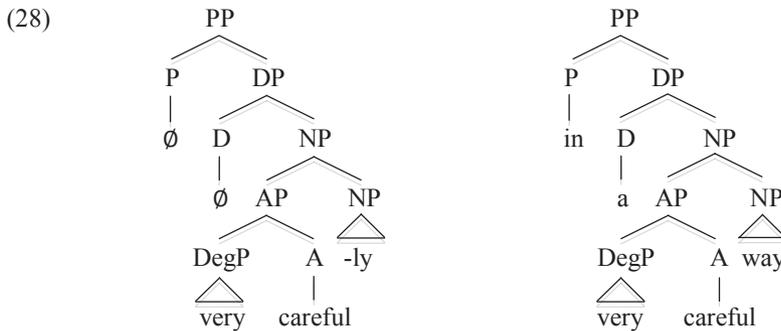
First, I assume that *-ly* adverbs contain a semantically non-vacuous P head, which  $\theta$ -marks *-ly*, and not a semantically empty K head (as also assumed in Alexeyenko [2012]). The reason for this is that if adverb(ial)s are K(P)s, there must be a functional head in the extended projection of V that  $\theta$ -marks them and assigns Case to them, since K does not *assign* Case, it *bears* Case. Hence, there is one more silent functional head to argue for; moreover, a null pronoun must be assumed to be present when an overt adverb(ial) is absent. By contrast, the analysis in terms of a P head does not have these implications.

<sup>11</sup> See also Katz and Postal (1964) and Emonds (1976) for transformational approaches that derive *-ly* manner adverbs from PPs of the form *in a(n) AP way*.

Second, contra Travis (1988) and Déchaine and Tremblay (1996), I assume that *-ly* adverbs are maximal projections rather than heads, because they can take modifiers (*very quickly*) and sometimes complements (*independently of*), cf. Section 3.1.1. And the contrast in (27) should be accounted for in terms of *relative weight* and not levels of projection (Alexiadou 1997; Ernst 2002).

Third, I assume that a DP layer is present between PP and NP in the structure of *-ly* adverbs, following the standard view that P takes DP as its complement, rather than NP.

Summing up, the internal structure of *-ly* adverbs is proposed to be as in (28). Note that this analysis implies that degree modifiers of *-ly* adverbs are in fact degree modifiers of their base adjectives.



Thus, according to this analysis, *-ly* adverbs are structurally identical with prepositional adverbials, such as those illustrated in (29) for various semantic classes of adverbs. The difference is only that the P and D heads of *-ly* adverbs are null and the adjective + noun combinations in their structure are morphologically merged.

- (29) (a) He drives *carefully*. (manner adverb)  
 ~ in a careful way/manner
- (b) He *fully* understands the problem. (degree adverb)  
 ~ to a full extent/degree
- (c) He *regularly* goes to the gym. (frequency adverb)  
 ~ on a regular basis
- (d) He was *briefly* married. (duration adverb)  
 ~ for a brief time

- (e) He lives *centrally*. (location adverb)  
~ in a central location
- (f) He is *financially* independent. (domain adverb)  
~ from a financial point of view

Another question relates to the function of *-ly*. The main semantic contribution of *-ly* adverbs is made by their base adjectives, which must occur inside PPs, since P is necessary to link them to the verbal structure syntactically and the event structure semantically. Adjectives cannot occur in PPs on their own, however; they need nouns to adjoin to. Furthermore, English requires the head nouns of attributive adjectives to be *overt*; therefore, a dummy noun, such as *one* in the examples below from Jackendoff (1971, 28), must be inserted in the absence of a semantically full noun:

- (30) (a) I like Bill's yellow shirt, but not Max's red \*(one).  
(b) I like Bill's yellow shirt, but not Max's (\*one).

In view of this fact, I suggest that *-ly* is a semantically vacuous dummy noun inserted for grammatical reasons, specifically, because the base adjectives of deadjectival adverbs require that their head nouns be overt. Thus, the presence of *-ly* in adverbs is a manifestation of a more general constraint on attributively modified nouns in English.

### 3.3 The Arguments for the Inflectional Analysis Reconsidered

Section 3.1 presented evidence that *-ly* is a nominal morpheme, rather than a suffix, as commonly assumed, which forms the basis for the PP analysis of adverbs. Furthermore, the data in Section 2.1, which have been used as arguments for the inflectional analysis, can in fact be accounted for by the PP analysis as well, as will be shown below.

First, the fact that *-ly* adverbs allow the same degree modifiers as adjectives follows trivially if degree modifiers of adverbs apply to their base adjectives, cf. (28). Second, the fact that comparative/superlative morphology cannot attach to *-ly* can be explained as the inability of degree morphology to attach to nouns. Third, the fact that *-ly* adverbs do not take derivational suffixes can be accounted for on the same grounds as the inability of corresponding prepositional adverbials (cf. [29]) to participate in further derivation by suffixation. Indeed, forms such as *\*in-a-careful-way-ness*, *\*to-a-full-extent-ish*, or *\*from-a-financial-point-of-view-hood* are unavailable, although derivational suffixes can attach to phrasal bases in general and to PPs in particular,

cf. *above-averagehood*, *out-of-towner*, *over-the-topism*, etc. from the COCA, cited in Bauer et al. (2013, 513–14).<sup>12</sup>

Furthermore, the facts about the distribution of adverbs discussed in Section 2 in connection with the claim concerning the complementary distribution of adjectives and adverbs are consistent with the PP analysis as well. First, the fact that *-ly* adverbs cannot *pre*-modify nouns accords with the inability of PPs to do so, cf. (31), presumably as a result of the Head-Final Constraint on modifiers (see Section 3.1.1).<sup>13</sup> Second, if Payne et al. (2010) are right that *-ly* adverbs can *post*-modify non-deverbal nouns, this would accord with the ability of PPs to right-adjoin to NPs, cf. (32).

(31) (a) \*the under the table box

(b) \*the in the afternoon meeting

(32) (a) the box under the table

(b) the meeting in the afternoon

Third, the fact that *-ly* adverbs cannot be used predicatively also matches the distribution of PPs, even though at first glance it may appear to the contrary in the light of examples such as those below:

(33) (a) Your box is under the table.

(b) Our meeting is in the afternoon.

Yet, even if some PPs can be used predicatively, like the locative and temporal ones in (33), many cannot, as (34) shows for some of the adverbials from (29):

(34) (a) \*His driving is in a careful way.

(b) \*His understanding of the problem is to a full extent.

12 The reason why *-ly* adverbs and their adverbial counterparts do not participate in further word formation might be that all relevant derivations can be formed in a simpler way from the underlying adjectives, which make the main semantic contribution of adverb(ial)s, and this blocks more cumbersome deadverbial derivations. Note also that *-ly* adverbs do in fact give rise to rare derivations, cf. *meagerliness* and *leanliness* from the COCA.

13 Examples such as *an above-average result* and *an after-lunch nap* show that non-head-final PP modifiers can sometimes be pre-nominal. The Head-Final Constraint does not apply to them, possibly because they are formed in the lexicon, while *-ly* adverbs are phrasal entities formed in the syntax.

- (c) \*His independence is from a financial point of view.

If PPs are generally able to appear predicatively, the ungrammaticality of examples as in (34) seems to be difficult to explain. If, by contrast, PPs cannot occur in the predicative position, i.e., as complements of Pred, it may be argued that examples like the one in (33) are in fact not instances of PP predication. In particular, *be* may be argued to be a lexical verb in such cases, as suggested by its interpretation as *be located* in (33a) and *happen/occur* in (33b), rather than an auxiliary verb associated with Pred which bears tense/aspect and agreement morphology. The latter view receives support from the fact that in languages with phonologically overt Pred, such as Edo and Chichewa, PPs cannot be selected by Pred; instead, a lexical verb with locative/posture meaning or the verbal copula must be used (Baker 2003, 314–15). Thus, if we assume with Baker that PPs cannot be complements of Pred, the inability of *-ly* adverbs to occur predicatively follows straightforwardly from their analysis as PPs.

Finally, a general advantage of the analysis of *-ly* adverbs as PPs is the fact that it is a major step towards eliminating adverbs as a separate lexical category and, thus, reducing the inventory of categories, for *-ly* adverbs constitute the predominant majority of adverbs. Obviously, to dispense with the category of adverbs altogether, non-deadjectival adverbs must be shown to belong to other categories.

## 4. Conclusions

This paper has been concerned with the question of whether deadjectival adverbs in English constitute a separate category or belong to some other lexical class. It has reviewed the main arguments for the two standard approaches to *-ly* adverbs, according to which they either constitute an independent lexical class or form a major single category with adjectives, and has presented data that are problematic for both approaches. These data suggest instead that *-ly* is a nominal morpheme, rather than a suffix, and, on the basis of these data, *-ly* adverbs have been proposed to be null-headed PPs that contain the dummy noun *-ly* which is modified attributively by the base adjectives of adverbs.

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# Subjunctives: How Much Left Periphery Do You Need?

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**Abstract:** In this paper we explore the left periphery (LP) of subjunctive clauses selected by desiderative and psych-emotive verbs, concentrating on the availability of contrastive focus in (European and Brazilian) Portuguese, Spanish, and English. We claim that the composition of the LP correlates with the distinction between agreement-prominent languages and discourse-prominent languages, in that the latter allow for a more flexible LP in subjunctives. Moreover, it also correlates with the specific type of matrix verbs which select the subjunctive clause. We argue that in European Portuguese and Spanish (discourse-prominent languages), Contrastive Focus Fronting is possible with desiderative and psych-emotive verbs, but the focused element occupies a post-verbal position (V moves to a high position in the LP); whereas in English (agreement-prominent languages), CCF is not allowed in subjunctives.

**Keywords:** subjunctive; left periphery; contrastive focus; V-movement.

## 1. Introduction

In this paper we explore the left periphery of subjunctive clauses selected by desiderative and psych-emotive verbs, concentrating on the availability of contrastive focus in Portuguese, Spanish, and English.

### 1.1 Problems and Background

There has always been a certain controversy with respect to the semantic and syntactic analysis of subjunctive clauses (Quer 2006). Properties which have been analyzed in the literature include the following:

- Obviation (impossibility of coreference between subjunctive subject and matrix subject [Picallo 1984])
- Defective tense (tense in subjunctives seems to be dependent on matrix tense [Picallo 1984; Raposo 1986])
- The existence of an operator-like Comp in subjunctives (Kempchinsky 1986; 1990)
- Worlds, (non)veridicality, and evaluation model shift (Giannakidou 1998; 2009; Quer 2001; 2009)

However, no full account can be found of the discourse properties of subjunctive clauses, which is the gap that we intend to fill in this paper.

Before we address the special status of the left periphery of subjunctive clauses, we have to discuss the issue that there is no consensus on contrastive focus fronting (CFF) in European Portuguese (EP). Raposo (1998) claims that Portuguese is the only (major) Romance language with English-style topicalization of a definite direct object. Hence, in contrast with Spanish and French (1b–c), Portuguese allows sentences such as (1a) similar to English (1d):

- (1) (a) Esse livro<sub>i</sub>, o Luís comprou e<sub>i</sub> para a Maria.  
 that book the Louis buy-PAST.3SG for the Maria  
 “Louis bought that book for Maria.”
- (b) \*Ese libro<sub>i</sub>, Luis ha comprado e<sub>i</sub> para María.
- (c) \*Ce livre<sub>i</sub>, Louis a acheté e<sub>i</sub> pour Marie.
- (d) That book, Louis bought e<sub>i</sub> for Maria.

In addition to topicalization, Portuguese also has the so-called Clitic Left Dislocation (CLLD), where the DP topic is resumed by an accusative definite clitic pronoun (Duarte 1987; Cinque 1990). This is common to the rest of Romance languages, as illustrated in (2):

- (2) (a) Esse livro, o Luís comprou-o para a Maria.  
 that book the Louis buy-PAST.3SG-CL for the Maria  
 “Louis bought that book for Maria.”
- (b) Ese libro, Luis lo compró para María.
- (c) Ce livre, Louis l’ a acheté pour Marie.  
 “That book, Louis bought it for Maria.”

Sentences (1a) and (2a) are basically equivalent in Portuguese, semantically and discourse-wise. The initial DP corresponds to old, presupposed information. Raposo (1998, 197–98) argues that (1a) is not a case of Focus Fronting, where the initial DP conveys focal assertion, as is the case in the Spanish example (3).

- (3) ESOS LIBROS ha leído Juan.  
 those books have-PRES.3SG read John  
 “Those books John has read.”

Here, the initial focus is necessarily associated with a gap in direct object position. In any case, Raposo (2000) maintains that Portuguese lacks the construction illustrated in (3) with a non-quantified DP, but claims that there is a Focus Phrase in EP, focus movement being restricted to quantified expressions:

- (4) Muito whisky bebeu o capitão.  
 much whisky drink-PAST.3SG the captain  
 “The captain drank much whisky.”

Costa (2002, 97–98) observes that these constructions “seem to be better described as instances of exclamative or evaluative sentences, as defended in Ambar (1999)” and suggests that “if there is FocusP, it will be relevant for exclamative or evaluative sentences, not for information focus.”

Ambar (1988) argues that in *information focus* (reinterpreting “free inversion”), the focused element is post-verbal (also Costa 1998), being introduced by a (null) topic-like element corresponding to old information—if a clitic occurs, enclisis is chosen. Inversion is instantiated as V-to-C movement (5a). CFF does not occur in this context, unless it is associated with a *non-exhaustive* reading (5b):

Informational focus (EP)

- (5) Q: Quem comeu o bolo?  
 who eat-PAST.3SG the cake  
 “Who ate the cake?”

A: (a) (O bolo) comeu a Joana.  
 the cake eat-PAST.3SG the Jane  
 “Jane ate it.”

- (b) A Joana comeu...  
 the Jane eat-PAST.3SG  
 “Jane ate . . .” (*non-exhaustive*: I don’t know who else ate )

The cut between topicalization and CFF is an old and controversial issue, not only in Portuguese (cf. [1] above<sup>1</sup>). In both Spanish and Portuguese the Contrastive Focus phrase can be left in situ.

Sentences like (6) have been identified as instances of focus fronting (Benincà [1988], Cinque [1990], and Jiménez-Fernández [2013] call it Resumptive Preposing; other authors such as Uriagereka [1995] and Leonetti and Escandell-Vidal [2009] call it focus or *verum* focus; for Portuguese, Rouveret [1999], Duarte [1997], and Barbosa [2009] dub it Quantifier Phrase Fronting):

- (6) Isso dizem eles.  
 that say-PRES.3SG they  
 “They say that.”

Ambar (1999) notes that in EP (6) covers different structures, as the different readings and positions of the clitic in (7b–c) suggest:

- (7) Q: Quem (lhe) diz isso?  
 who him say-PRES.3SG that  
 “Who said that (to him)?”

A: (a) Isso dizem eles.  
 that say-PRES.3PL they  
 “They say that.”

(b) Isso dizem-lhe eles. (informational focus—enclisis)

(c) \*Isso lhe dizem eles. (infelicitous as informational focus—proclisis)

But (7c) is well-formed as an *evaluative structure* expressing the speaker’s attitude toward the facts described, with focus on the entire clause, thus contrasting with the information focus in (5) and (7a), as illustrated in (8):

- (8) Isso (lhe) dizem eles!  
 that him say-PRES.3PL they  
 “They say that (to him)!”

<sup>1</sup> Torrego (1984, 110n19) argues that the Spanish equivalent of English topicalization requires inversion and “might be considered Wh-focus constructions”; Cinque (1996, 107n6) claims that it “should perhaps in Italian be named more accurately ‘Focus Movement,’ owing to the heavy stress and pragmatic contrast falling on the topicalized phrase.”

These and other facts led to the proposal of EvaluativeP and AssertiveP as speaker projections of the left periphery (Ambar 1999; 2003): the latter encodes “what the speaker knows,” inspired by Searle’s (1969) definition of “assertive,” and it is Common Ground related; the former coins the speaker’s attitude (unexpected by the addressee), it extends the Common Ground. The label *Evaluative* was inspired by Barwise and Cooper’s (1981) distinction between pure and evaluative quantifiers; only the latter can enter evaluative structures:

- (9) (a) Muitos livros (o Pedro) comprou (o Pedro)!  
 many books the Peter buy-PAST.3SG the Peter  
 “Peter bought many books.”
- (b) \*Todos os livros de Sintaxe comprou o Pedro!  
 all the books of Syntax buy-PAST.3SG-CL the Peter  
 “Peter bought all the Syntax books.”

The restriction does not hold for focus structures:

- (10) Q: Quem leu todos os livros?  
 who read-PAST.3SG all the books  
 de Sintaxe I?  
 of Syntax I  
 “Who read all the books of Syntax I?”
- A: Todos os livros leu o João.  
 all the books read-PAST.3SG the John  
 “John read all the books.”

Now the point is whether CFF is distinct from evaluative structures. In (11a) the speaker expresses his/her attitude of disagreement regarding A, it is evaluative in our terms. Clefts provide contrastive focus (Zubizarreta 1998; Costa 2002; a.o.), as shown in (11b):

- (11) A: A Joana publicou o seu primeiro  
 the Jane published-PAST.3SG the her first  
 livro em Portugal.  
 book in Portugal  
 “Jane published her first book in Portugal.”

- B: (a) Não, O SEGUNDO LIVRO publicou  
 No the second book published-PAST.3SG  
 em Portugal, não o primeiro.  
 in Portugal not the first  
 “No, THE SECOND BOOK she published in Portugal, not the first one.”
- (b) Não. Foi O SEGUNDO LIVRO  
 No be-PAST.3SG the second book  
 que a Joana publicou em  
 that the Jane published-PAST.3SG in  
 Portugal, não o primeiro.  
 Portugal not the first  
 “No. It was HER SECOND BOOK that Jane published in Portugal,  
 not her first one.”

However, if (8) is inserted in a cleft part of its meaning is lost, as well as “focus” (not the best label) on the entire clause, suggesting that (8) and (11b) are not fully equivalent:

- (12) É isso que eles dizem  
 be-PRES.3SG that that they say-PRES.3PL  
 “It is that what they say.”

Other properties are involved, namely tense. Limitations of space preclude going through them here. For our purpose it is enough to hypothesize that CFF structures do exist in EP and have an unvalued evaluative feature in need of valuation. As will be clearer in what follows, our proposal also sheds light on the distinction between topicalization and CFF.

## 1.2 Subjunctives and Information Structure

After deciding on the existence of CFF in EP, the second problem we have detected (and the one which fully concerns us here) is that little attention has been paid to the information structure of subjunctive sentences. The exceptions have been Kempchinsky (2008) and Baunaz et al. (2013). For the former, desiderative verbs are not compatible with contrastive focus (CF) in the subjunctive clause; for the latter, directives and desideratives may have a full left periphery allowing CF (with other verbs, the LP in the subjunctive clause is defective and “truncated” à la Haegeman [2007]).

We claim that the composition of the LP correlates with the distinction between agreement-prominent languages and discourse-prominent languages, in that the latter allow for a more flexible LP in subjunctives. Moreover, it also correlates with the

specific type of matrix verbs which select the subjunctive clause. We argue that in Portuguese and Spanish (discourse-prominent languages), CF is possible with desiderative and psych-emotive verbs, but the focused element occupies a post-verbal position (see the contrast in examples [13–14]); whereas in English (agreement-prominent languages), CF is not allowed in subjunctives (15), in line with Hooper and Thompson’s (1973) distinction between emotive and assertive contexts:<sup>2</sup>

(13) (a) ??Quiero            que            LOS    LIBROS    coloques  
           want-PRES.1SG    that            the    books    put-PRES.3SG  
           en la                estantería    (no    las            revistas).  
           on the                shelf        not    the            magazines

(b) ??Quero que OS LIVROS coloques na estante (não as revistas).  
 “I want you to put THE BOOKS on the shelf, not the magazines.”

(14) (a) Quiero            que    coloques    LOS            LIBROS    en  
           want-PRES.1SG    that    put-PRES.2SG    the            books    on  
           la estantería    (no    las            revistas.)  
           the shelf        not    the            magazines

(b) Quero que coloques OS LIVROS na estante (não as revistas).  
 “I want you to put THE BOOKS on the shelf, not the magazines.”

(15) \*The professor asked that HER RESEARCH PAPER Mary submit before  
 the end of the month (not her dissertation).

In these examples the focused constituent is the object, but focusing the subject also yields a similar contrast in positional terms (in English this effect cannot be determined):

(16) (a) ??Quiero            que            MARÍA    coloque    los  
           want-PRES.1SG    that            Maria    put-PRES.3SG    the  
           libros                en la            estantería    (no            Juan).  
           books                on the            shelf        not            John

(b) ??Quero que A MARIA coloque os livros na estante (não o João).

<sup>2</sup> Our data present the Spanish example first and then the Portuguese one. The gloss will be provided only for Spanish when the examples in the two languages are identical.

(17) (a) Quiero que coloque MARÍA los libros en la estantería (no Juan).

(b) Quero que coloque A MARIA os livros na estante (não o João).

(18) (a) Quiero que coloque los libros en la estantería MARÍA (no Juan).

(b) Quero que coloque os livros na estante A MARIA (não o João).

“I want MARY to put the books on the shelf (not John).”

As we will see below, these contrasts do not arise in indicative clauses.

Our working hypothesis is that with desiderative and psych-emotive verbs, CFF is available in Spanish and Portuguese but for independent reasons CF must occur following the subjunctive verb.

Within cartography, we propose that subjunctives in Portuguese and Spanish project Force, which is a syncretized head made up of two heads, Evaluative and Assertion (Ambar 1999; 2003), and any discourse-related categories below Force. Concentrating on desideratives and psych-emotives, we explain the preference of the pattern V-CF over CF-V by proposing that V moves to Assert (for tense reasons, tense being seen as a *bundle of features*; also to value an [Evaluative] feature, connected with focus, which creates a relativized minimality effect). CF undergoes movement to spec-FocP but V surpasses Foc since it targets a higher position.

As for English, we suggest that LP in subjunctives is impoverished and hence a truncation analysis will accommodate the relevant data.

## 2. A Critical View on Background and Data

In this section we discuss data connected with embedded subjunctives alongside the information-structure based proposals that we have found in the literature. Kempchinsky (2008) claims that there are language-particular distinctions between topic and focus.

For her, in Spanish indicative subordinate clauses, both CLLD and CFF are possible. However, in subjunctive clauses, CLLD is possible but CFF is not. The contrast is illustrated in (19–20):

- (19) (a) Ha                      dicho              que    A NADIE        devolvieron  
           have-PRES.3SG    said              that    to no one        return-PAST.3PL  
           su                        manuscrito.  
           their                    manuscript  
           “S/he has said that to NO ONE they returned their manuscript.”

- (b) Ha                      dicho              que      su              manuscrito    se lo  
 have-PRES.3SG        said            that     their          manuscript    CL CL  
 devolvieron            ayer.  
 return-PAST.3PL      yesterday  
 “S/he said that his manuscript they returned it to him yesterday.”
- (c) Ha                      dicho      que      su              manuscrito    a  
 have-PRES.3SG        said        that     their          manuscript    to  
 nadie                    se          lo          devolvieron.  
 no one                  CL        CL        return-PAST.3PL  
 “S/he said that his manuscript to no one they returned it.”
- (20) (a) \*El editor        quiere                      que    A NADIE        devuelvan  
 the editor            want-PRES.3SG        that    to no one        return-PRES.3PL  
 su                      manuscrito.  
 self’s                manuscript  
 “The editor wants NO ONE to be returned their manuscript.”
- (b) El editor            quiere                      que      su              manuscrito  
 the editor            want-PRES.3SG        that     self’s          manuscript  
 se lo                    devuelvan              ahora    mismo.  
 CL CL                return-PRES.3PL    now     same  
 “The editor wants their manuscript to be returned to him right now.”
- (c) \*El editor        quiere                      que      su              manuscrito  
 the editor            want-PRES.3SG        that     self’s          manuscript  
 A NADIE            se                              lo          devuelvan.  
 to no one        CL                            CL        return-PRES.3PL  
 “The editor wants his manuscript to be returned to NO ONE.”

The explanation Kempchinsky gives for the unavailability of CFF in subjunctives is that “Fin within the subjunctive clause is in the domain of the buletic model of the speaker (lexically entailed by the matrix predicate), hence can’t access discourse context.” However, this does not account for our data from Spanish and Portuguese in (13–14) and (16–17) since the subordinate Fin falls within the domain of the matrix predicate.

Kempchinsky also offers the data in (21) with volitional verbs and argues that these verbs select a subjunctive clause which is incompatible with hanging topics (21d) and with CFF (21b–c), though not with CLLD (21a):

- (21) (a) Elena        *prefiere*                *que*    *el coche*    *lo*    *dejen*  
 Elena        *prefer-PRES.3SG*        *that*    *the car*     *CL*    *leave-PRES.3PL*  
*con*        *su hija*                *los*    *fines*        *de semana.*  
*with*       *self's daughter*       *the*    *ends*        *of week*  
 “Elena prefers the car to be left with their daughter on weekends.”
- (b) \*Elena        *prefiere*                *que*    *el coche*     *CON SU*  
 Elena        *prefer-PRES.3SG*        *that*    *the car*     *with self's*  
 HIJA        *dejen*                *los*    *fines de*     *semana.*  
 daughter    *leave-PRES.3PL*        *the*    *ends of*     *week*  
 “Elena prefers the car to be left WITH THEIR DAUGHTER on weekends.”
- (c) \*Elena        *prefiere*                *que*    *CON SU*     *HIJA*  
 Elena        *prefer-PRES.3SG*        *that*    *with self's*    *daughter*  
*dejen*        *el coche*                *los*    *fines de*     *semana.*  
*leave-PRES.3PL*    *the car*                *the*    *ends of*     *week*  
 “Elena prefers them to leave the car WITH THEIR DAUGHTER on weekends.”
- (d) \*Elena        *prefiere*                *que*    *en cuanto a*    *Juan,*  
 Elena        *prefer-PRES.3SG*        *that*    *as for*        *John*  
*el coche*    *lo*    *deje*                *con*    *su hija*     *los*  
*the car*     *CL*    *leave-PRES.3SG*    *with*    *self's daughter*    *the*  
*fines*        *de semana.*  
*ends*        *of week*  
 “Elena prefers that with respect to Juan, the car he should leave with their daughter on weekends.”

The incompatibility with hanging topics in (21d) is expected since they are root phenomena and apparently these embedded clauses are not even root-like (RIDEs in Emonds' [2004; 2012] terminology). However, more difficult to explain are examples (21b–c) with CFF, given that Focus in Spanish seems to be compatible with all types of embedding (Camacho-Taboada and Jiménez-Fernández 2014).

The problem with desiderative verbs is not that embedded subjunctive is incompatible with CFF. Actually, CFF is possible in these contexts but the position of CF is lower than the verb, hence acceptability increases, as in (22) in Spanish. This is confirmed in Portuguese as well, as shown in (23).

- (22) Elena                    prefiere                   que           dejen                   CON LA  
 Elena                    prefer-PRES.3SG       that       leave-PRES.3PL       with self's  
 HIJA                    el                   coche       los fines       de semana  
 daughter            the                   car       the ends       of week  
 (no con            el hijo).  
 not with        the son  
 "Elena prefers them to leave the car WITH THE DAUGHTER on weekends  
 (not with the son)."

- (23) (a) ??A Helena        prefere                   que       COM A       FILHA  
           the Elena        prefer-PRES.3SG       that       with self's       daughter  
           deixem        o                   carro       aos fins       de semana  
           leave-PRES.3PL   the                   car       on.the ends       of week  
           (não com        o filho).  
           not with        the son

- (b) A Helena prefere que deixem COM A FILHA o carro aos fins de semana  
 (não com o filho).  
 "Elena prefers them to leave the car WITH THE DAUGHTER on weekends  
 (not with the son)."

The position of the emphatic PP may be pre-verbal in both languages too, as illustrated in (24a) for Spanish and (24b) for Portuguese:

- (24) (a) Elena                    prefiere                   que       CON LA       HIJA  
           Elena                    prefer-PRES.3SG       that       with self's       daughter  
           dejen                    el                   coche       los fines       de semana,  
           leave-PRES.3PL   the                   car       the ends       of week  
           con el hijo        la bicicleta.  
           with the son       the son

- (b) A Helena prefere que COM A FILHA deixem o carro aos fins de semana,  
 com o filho a bicicleta.  
 "Elena prefers them to leave the car WITH THE DAUGHTER on week-  
 ends, the bicycle with the son."

However, the CF reading is lost here, and instead a pair-list reading obtains. This list reading is possible with a preverbal constituent, but then the precise discourse category is that of a contrastive topic (Frascarelli 2007).

Kempchinsky (2008) claims that in general “the closer the identity between the default world of evaluation (the speaker’s epistemic model of the actual world, cf. Quer [2001]) and the world of evaluation of the subordinate clause, the greater the range of left peripheral operations allowed.” Hence she argues that the use of CFF is allowed in some subjunctive clauses that she considers problematic, as is the case of subordinate clauses to factive-emotives, where CFF is allowed. Factive-emotive complements have a complex model of evaluation: a buletic intensional model anchored to the matrix subject (cf. Villalta 2001; Kempchinsky 2008) and the epistemic model of the matrix subject. This is illustrated in (25) from Zubizarreta (1998):

- (25) Lamento                    que            LAS            ESPINACAS            no le  
 regret-PRES.1SG            that            the            Spinachs            not CL  
 gusten                        a            Pedro            (y no las            papas).  
 like-PRES.3PL            to            Peter            and not the            potatoes  
 “I regret that SPINACH Pedro doesn’t like (and not potatoes).”

The problem is that with desideratives, the world of evaluation in the subjunctive clause is also anchored by the matrix subject, so no distinction is detected between the world of evaluation in factive-emotives (our psych-emotives) and the one in desideratives. Another explanation should be found.

Haegeman (2007) discusses the incompatibility of argument fronting and subjunctive in English:

- (26) \*It’s important that the book he study carefully.  
 (Hooper and Thompson 1973, 485; their ex. [166])

Following Kempchinsky (1986), Haegeman assumes that subjunctive clauses contain an operator in spec-CP, and suggests an intervention effect between this operator and the fronted DP for the ungrammaticality of (26).

Hooper and Thompson (1973) give additional examples with subjunctives:

- (27) (a) \*The senator proposed that the troops, they be withdrawing immediately.  
 (b) \*This scene requires that up the street trot the dog.  
 (c) \*It’s mandatory that in the halls stand the guards.

These sentences in English contain either topic preposing or locative inversion, and their ungrammaticality is accounted for in terms of intervention. All of them are fine

in Spanish or Portuguese. This raises the question as to whether English subjunctive is compatible with CFF. Our intuition is again “no,” which is borne out in (28).<sup>3</sup>

- (28) (a) The professor asked that Mary submit her research paper before the end of the month (not her dissertation).  
 (b) \*The professor asked that HER RESEARCH PAPER Mary submit before the end of the month (not her dissertation).  
 (c) \*HER RESEARCH PAPER the professor asked that Mary submit before the end of the month (not her dissertation).

This can be explained by the relative poorness of the left periphery in English. This makes sense since English, as opposed to Spanish/Portuguese, is an agreement-oriented language, not a discourse-prominent language (Miyagawa 2010; Jiménez-Fernández and Miyagawa 2014).

Baunaz et al. (2013) propose that the basic structure of subjunctive-type complements is as follows:

- (29) [(SubP) . . . JussiveP . . . W(orld)P . . . TopP . . . FocP . . . ModP . . . TP . . . MoodP . . . AspP . . . VP

For them directives and desideratives allow a full left periphery with Top and Foc, but propose a truncated LP for the rest of predicates. Crucially, contrary to Kempchinsky (2008), Baunaz et al. (2013) entertain that desideratives allow FF in embedded subjunctives in at least languages such as Napolitan (30) and Hungarian (31):

- (30) Gianni           vulesse           ca           UN LIBRO           purt  
 John                want-PRES.3SG   that        a book             turn-PRES.3PL  
 addereto,         e no dduje.  
 back               and not two  
 “John wants ONE BOOK to be returned, and not two.”

- (31) János           (azt)   kivánja,           hogy           az újságokat  
 John           Prt   wish-PRES.3SG   that           the newspapers  
 CSAK         A   PINCÉBE.         tároljuk.  
 only         in   basement         stores-PRES.1PL  
 “János wants us to store the newspapers ONLY IN THE BASEMENT.”

3 For focus fronting in English, see Culicover and Rochemont (1983).

Other types of subjunctives do not allow FF because their LP is truncated. The main problem that we find with this proposal is that it does not account for the data in Spanish and Portuguese.

### 3. Our Data: A Puzzling Challenge from Embedded Subjunctives with Volitional and Emotive Predicates

In Portuguese and Spanish, desideratives allow FF but the focused element most naturally follows the verb, as illustrated in (13–14), repeated here as (32–33) and (34). The (a) sentences are Spanish; the (b) sentences are Portuguese:

(32) (a) ??Quiero que LOS LIBROS coloques  
 want-PRES.1SG that the books put-PRES.3SG  
 en la estantería (no las revistas).  
 on the shelf not the magazines

(b) ??Quero que OS LIVROS coloques na estante (não as revistas).  
 “I want you to put THE BOOKS on the shelf, not the magazines.”

(33) (a) Quiero que coloques LOS LIBROS en  
 want-PRES.1SG that put-PRES.2SG the books on  
 la estantería (no las revistas.)  
 the shelf not the magazines

(b) Quero que coloques OS LIVROS na estante (não as revistas).  
 “I want you to put THE BOOKS on the shelf, not the magazines.”

(34) (a) Quiero que coloques en la estantería LOS LIBROS (no las revistas).

(b) Quero que coloques na estante OS LIVROS (não as revistas).  
 “I want you to put THE BOOKS on the shelf, not the magazines.”

It can be objected that (33–34) are not instances of CFF, and hence no movement is involved. However, evidence that in both sentences the DP object undergoes movement to the LP comes from the fact this object must be generated as complement of V. If the PP on the shelf is interpolated between V and the DP object, this means that rearrangement (via movement) has taken place. What is interesting is that in Portuguese and Spanish, CFF is compatible with desideratives but only if CF is postverbal. How about psych-emotive verbs? Similar data can be found which confirm the compatibility of this class of verbs and CFF:

- (35) (a) ??Me sorprende que CON ÂNGELA te  
 CL surprise-PRES.3SG that with Angela CL  
 encontraras en la fiesta (y no con Ana).  
 find-PAST.2SG in the party and not with Ann
- (b) ??Surpreende-me que COM A ÂNGELA te tenhas encontrado na festa  
 (e não com a Ana).
- (36) (a) Me sorprende que te encontraras CON ÂNGELA en la fiesta (y no con Ana).
- (b) Surpreende-me que te tenhas encontrado COM A ÂNGELA na festa  
 (e não com a Ana).
- (37) (a) Me sorprende que te encontraras en la fiesta CON ÂNGELA (y no con Ana).
- (b) Surpreende-me que te tenhas encontrado na festa COM A ÂNGELA  
 (e não com a Ana).  
 “It surprises me that you met ANGELA at the party (not Ana).”

Note that embedded indicatives do not display this positional constraint:

- (38) (a) Me dijeron que CON ÂNGELA te  
 CL tell-PAST.3PL that with Angela CL  
 encontraste en la fiesta (y no con Ana).  
 find-PAST.2SG in the party and not with Ann
- (b) Disseeram-me que COM A ÂNGELA te encontraste na festa (e não com Ana).
- (39) (a) Me dijeron que te encontraste CON ÂNGELA en la fiesta (y no con Ana).
- (b) Disseeram-me que te encontraste COM A ÂNGELA na festa (e não com  
 a Ana).
- (40) (a) Me dijeron que te encontraste en la fiesta CON ÂNGELA (y no con Ana).
- (b) Surpreende-me que te encontraste na festa COM A ÂNGELA  
 (e não com a Ana).  
 “Someone told me that you met ANGELA at the party (not Ana).”

The natural conclusion we draw from our data is that CFF is fully accepted in desiderative and emotive subjunctives, but this CCF must always be preverbal CF.

#### 4. Our Proposal: V Moves to Assert

In this section we present our analysis for embedded subjunctives in desiderative and psych-emotive contexts. Based on Ambar (2003), we propose the structure in (41):

(41) XP [<sub>EvaluativeP</sub> [Evaluative [<sub>AssertivP</sub> [Assertive [XP [<sub>FocusP</sub> [Focus [XP [<sub>IP</sub> I [<sub>VP</sub> v+V . . .

We claim that V moves to Assert for tense reasons, tense being seen as a *bundle of features* (Ambar, forthcoming). This explains why T is defective in subjunctives. V also values an [Eval] feature, connected with focus, which creates a relativized minimality effect. This accounts for the high position of V in embedded clauses with desiderative and psych-emotive verbs.

On the other hand, CF undergoes movement to spec-FocP to value an unvalued [Foc] feature and check the corresponding [EPP] feature under Focus. This explains why CF is always post-verbal.

As argued by Ambar (2003), XP stands for any topic position. It can be subject to types of topics. This accounts for the different slots that CLLD can fill in the derivation. Finally, our analysis also accommodates the data in (23) with pair-list interpretation for which a Contrastive Topic occurs higher than the verb, in that the verb does not move because focus is not activated. In other words, it is the [Eval] and [Foc] features that trigger V movement. Thus, in (23) the PP *con la hija/com a filha* “with the daughter” is in spec-TopP and the verb remains low because it has no [Eval] feature.

Let us illustrate our analysis. Consider (42) and the structure we propose in (43):

(42) (a) Prefiero                    que    prepare                    EL INFORME    FINAL  
           prefer-PRES.1SG        that    prepare-PRES.3SG    the report        final  
           la secretaria        (no    la    versión        preliminar).  
           the secretary        not    the    version        preliminary

(b) Prefiro que prepare O RELATÓRIO FINAL a secretária  
 (não a versão preliminar).  
 “I prefer the secretary to prepare the final report, not the preliminary version.”

(43) Prefiero [<sub>EvaluativeP</sub> [<sub>Evaluative</sub> que [<sub>AssertivP</sub> [<sub>Assertive</sub> prepare [<sub>XP</sub> [<sub>FocusP</sub> EL INFORME  
 FINAL [<sub>Focus</sub> prepare [<sub>XP</sub> la secretaria [<sub>IP</sub> la secretaria prepare el informe final]]]]]]]]]]

Note that we are presuming that the subject is a topic, which may occur either following or preceding the focused constituent. This is captured by optionally projecting XP

(TopP) immediately below or above FocP. The topic nature of subjects in this construction is supported by the impossibility of indefinite non-specific pronouns, which are never selected as topics:

- (44) (a) Prefiero que prepare EL INFORME FINAL la secretaria/\*?él/\*alguien (no la versión preliminar).  
 (b) Prefiro que prepare O RELATÓRIO FINAL a secretária/\*?ele/\*alguém (não a versão preliminar).  
 “I prefer the secretary/he/someone to prepare the final report (not the preliminary version).”

Now we have to account for the successive movement of the subjunctive. What are the features triggering movement in Evaluative, Assertive, and Focus?

Our intuition is that subjunctives are quasi-operators which carry interpretable [+evaluative] and [+assertive] features. The relevant functional categories in the Left Periphery will probe in search of a suitable goal to value their uninterpretable evaluative and assertive features. Both Eval and Assert have verb features (maybe TNS, in line with Ambar to appear) triggering movement of the relevant head.

On the other hand, the focus feature in Foc is valued via Agree with the DP *el informe final*, but Foc carries an EPP feature which drags the focused constituent along to spec-FocP. This will explain the word order attested in Spanish and Portuguese.

Our analysis also raises the question as to why the focused DP cannot move to a higher position. In other words, what is it that stops this DP from preceding V? The answer now is simple: because it has no evaluative or assertive features, and because V needs to be in the search domain of the matrix verb to value tense features. If CF intervenes, it creates a relativized minimality effect.

As stated earlier, our analysis also accounts for higher occurrences of an emphatic DP in desideratives and psych-emotives, in which case the preposed DP is a Contrastive Topic. Hence, the examples in (45) are analyzed as in (46):

- (45) (a) Quiero                    que                    los    libros            coloques  
 want-PRES.1SG    that                    the    books            put-PRES.3SG  
 en la                    estantería,        las    revistas        en el armario,  
 on the                    shelf                    the    magazines        in the cupboard  
 los papeles            en la caja.  
 the papers            in the box

- (b) Quero que os livros coloques na estante, as revistas no armário e os papéis na caixa.

“I want you the book to put on the shelf, the magazine in the cupboard, the papers in the box.”

- (46) Quero [<sub>EvaluativeP</sub> [<sub>Evaluative</sub> que [<sub>AssertivP</sub> [<sub>Assertive</sub> [<sub>XP</sub> OS LIVROS [<sub>IP</sub> *pro* coloques os livros na estante]]]]]] as revistas no armário e os papéis na caixa.

## 5. Some Parametric Variation

In some languages, subjunctive classes are not distinguished in terms of V-movement to Assert. Our analysis poses questions about those languages in which desideratives and psych-emotives select subjunctive, but then CF is high in the LP, and hence it is pre-verbal. Such was the case of Hungarian and Napolitan (30–31). We surmise that this is the result of parametric variation with respect to the nature of Assert and Eval in different languages. In these languages the heads Assert and Eval establish a long-distance agree relation with their goal, and because they have no EPP feature, V raises as high as is independently required by other categories.

Let us look at the case of Napolitan (30), repeated as (47):

- (47) Gianni            vulesse            ca            UN LIBRO            Purt  
 John                want-PRES.3SG    that        a book                turn-PRES.3PL  
 addereto,        e no dduje.  
 back                and not two  
 “John wants ONE BOOK to be returned, and not two.”

As is clear, the focused constituent *un libro* precedes the subjunctive V, in contrast with Spanish and Portuguese. Napolitan, thus, is a language whose subjunctive clauses project Assert and Eval. However, these categories do not attract the verb simply because they carry no EPP feature. Hence, V remains lower (maybe in T or Finiteness in the LP).

Brazilian Portuguese is particularly revealing. Observe the following contrasts:<sup>4</sup>

- (48) (a) \*Quero            que            OS        LIVROS    a Maria  
 want-PRES.1SG        that        the        books     the Maria  
 coloque                na estante, não as revistas.  
 put-PRES.3SG        on.the shelf not the magazines  
 (b) \*Quero que coloque OS LIVROS na estante (a Maria), não as revistas.  
 “I want Mary to put THE BOOKS on the shelf, not the magazines.”

4 We thank Maria José Foltran, Patrícia Rodrigues, and Gustavo Freire for the BP data.

(c) OS LIVROS quero que a Maria coloque na estante, não a revista.

|          |           |              |              |     |               |
|----------|-----------|--------------|--------------|-----|---------------|
| (49) (a) | O João    | disse        | que          | OS  | LIVROS        |
|          | the John  | say-PRES.1SG | that         | the | books         |
|          | a Maria   | colocou      | na estante,  | não | as revistas.  |
|          | the Maria | put-PRES.2SG | on.the shelf | not | the magazines |

(b) \*O João disse que colocou OS LIVROS na estante (a Maria), não as revistas.  
“John says that Mary put THE BOOKS on the shelf, not the magazines.”

(50) (a) Quero que a Maria coloca os livros na estante. (some dialects of BP)  
“I want Mary to put the books on the shelf.”

(b) Quero que OS LIVROS a Maria coloca na estante, não as revistas.  
“I want Mary to put THE BOOKS on the shelf, not the magazines.”

The contrasts and conclusions above are predicted by our system and find support in other facts described in the literature: (i) BP lacks V-movement to the left periphery generally (Ambar 2003; Kato 2013; a.o.), as illustrated in (48–50)—actually, (48) shows that there is no LP in embedded subjunctives and CFF must involve the matrix LP; (ii) BP is losing indicative-subjunctive oppositions in given contexts (Marques 2004), as illustrated in (50); and (iii) the root-embedded divide regarding information structure is dependent on (the speaker’s) assertive features (Hooper and Thompson 1973), in turn dependent on tense, evoking Emonds’s (2004; 2012) insight.

## Conclusions

Our data have shown that in discourse-prominent languages such as Spanish and Portuguese the V moves to Assert in desiderative and psych-emotive subjunctives in order to be close enough to the matrix V and value its relevant features there. On its way to Assert, V passes through Foc. This explains why CF is most naturally placed in post-verbal position. On the other hand, BP has no CFF in embedded subjunctives because there is no V-movement to the LP. In agreement-prominent languages such as English, CFF is not allowed in subjunctives because its LP is too poor to project Foc.

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# Classifying Nominals in Brazilian Portuguese: A Unified Account for Gender and Inflectional Class

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**Abstract:** In this work it is proposed that the traditionally split notions of gender and inflectional class are, in fact, phonological exponents of the same syntactic head, that is, the gender head, which is part of the Extended Projection of the noun. Under the assumption that terminal nodes are devoid of phonological realization at a syntactic level, and that Vocabulary Items (VIs) compete for insertion at terminal nodes, the unpredictable cases are considered to be nothing more than the result of the existence of more specified VIs, which include the relevant roots in their contextual specification. It is also proposed that the gender head may have three possible feature specifications: [masculine], [feminine], or a pair of features containing both [[masculine], [feminine]]. The isolated features are opaque for interpretation, once they do not encode any contrast, but the pairing [[masculine], [feminine]] contributes to meaning in a very transparent way by codifying male/female interpretation.

**Keywords:** gender; nominal classes; theme vowels; locality; agreement.

## 1. Introduction

It is traditionally assumed that nouns in Brazilian Portuguese (BP), as in many other Romance languages, are divided into different inflectional classes according to the phonological ending of the noun (see Harris [1991; 1999] for Spanish; Ultra-Massuet [1999] for Catalan; Alcântara [2003; 2010] for BP; Acquaviva [2008] and Ferrari [2005] for Italian). In BP, this phonological ending is represented by a non-stressed vowel, which can be either *-a*, *-o*, *-e*, or  $\emptyset$ . It is also a well-known fact that nouns in BP are divided into two different gender groups: masculine and feminine. The most

common gender markings in BP are also represented by non-stressed vowels, which are generally *-a* for feminine and *-o* for masculine. Although generalizations can be found in the relation between gender and inflectional classes (nouns ending in *-a* tend to be feminine, while nouns ending in *-o* tend to be masculine) it is not possible to predict inflectional class based on gender information and vice-versa.

In this paper we investigate, from a syntactic point of view, the relation between gender and inflectional class. The traditional assumption is that they are autonomous domains of linguistic generalization that demand independent formal representations. However, the central claim of this paper is that gender and inflectional class occupy the very same syntactic position. More specifically, we propose that what has been traditionally separate in gender and inflectional classes are, in fact, phonological exponents of the same syntactic head, the gender head.

Under the assumption that terminal nodes are devoid of phonological realization at a syntactic level (late insertion) and that Vocabulary Items (VIs) compete for insertion at terminal nodes, it is proposed that the VI inserted in the gender head can be either the default or a more specified one. The default VIs map the gender head to *-a* in the context of a feminine feature, and to *-o* in the context of a masculine feature. The unpredictable cases (masculine nouns ending in *-a* or feminine nouns ending in *-o*, for example) are analyzed as the result of the existence of more specified VIs, which include the relevant Roots in their contextual specification. It is clear that unexpected phonological patterns have to be listed somewhere. Crucially, by specifying them on the contextual specification of the phonological pieces available in the language, the proposed analysis dispenses with any necessity of class diacritics at any level of the derivation. We argue, then, that, at least in PB nominal system, no class diacritics are necessary.

Dealing with the intuition that gender is only meaningful when it refers to pairs, we argue that three possible feature specifications may compose the gender head: [feminine], [masculine], or a pair formed by them both together [[feminine], [masculine]]. The phonological realization of the relevant syntactic feature may be either default or contextually specified. We propose, then, that the contribution of the isolated specification [feminine] or [masculine] is opaque, because no contrast is encoded by the isolated feature. On the other hand, when the gender head is doubly specified, it contributes to meaning in a very transparent way, by codifying the contrastive notions of male/female.

In order to develop the hypothesis sketched above, the paper is organized as follows: in Section 2, the properties associated to inflectional classes in BP are presented. In Section 3, some previous approaches to inflectional class are discussed. In Section 4, we develop a unified system to account for gender and inflectional class, and we show that it is perfectly possible to account for the empirical facts without the need of inflectional class diacritics at any level of the derivation. In Section 5, the

question of what gender is approached more deeply and, finally, Section 6 presents the general conclusions.

## 2. The Properties of Inflectional Classes in Brazilian Portuguese

Based on Harris (1999), Alcântara (2010) proposes that BP nouns are divided into four different inflectional classes, which are represented by I, II, III, and IV. Class I is formed by nouns ending in non-stressed *-a*, while class II has nouns ending in non-stressed *-o*. Class III is, in turn, more complex in the sense that nouns in this class can either end in non-stressed *-e* or show no theme vowel in the singular. Nouns that have no theme vowel in the singular are considered to be part of class III when they show the *-e* vowel in the plural (see also Câmara Jr. 1970). Finally, class IV is formed by nouns that never have a theme vowel, regardless of being in the singular or the plural. Crucially, the relation between gender and inflectional class is not always predictable, since masculine and feminine nouns can be found in all different classes:

| TV    | Class | Masculine                                      | Feminine                                      |
|-------|-------|--|---|
| -o    | I     | <i>livr-o</i> “book,” <i>menin-o</i> “boy”     | <i>libido</i> “libido,” <i>tribo</i> “tribe”  |
| -a    | II    | <i>planet-a</i> “planet,” <i>map-a</i> “map”   | <i>Cavern-a</i> “cave,” <i>menin-a</i> “girl” |
| -e/ Ø | III   | <i>tigr-e</i> “tiger,” <i>mar</i> “sea”        | <i>av-e</i> “bird,” <i>cor</i> “color”        |
| Ø     | IV    | <i>café</i> “coffee,” <i>avô</i> “grandfather” | <i>pá</i> “shovel,” <i>avó</i> “grandmother”  |

**Table 1.** Inflectional classes in BP (based on Alcântara’s [2010] system).

An important thing to point out about inflectional classes is that no systematic meaningful trait can be associated to them. Semantically, then, there is nothing grouping nouns inside the same inflectional class. In the same sense, there is no evident semantic feature that separates one class from the other. Inflectional classes are then considered to be meaningless.

Also, it is not possible to predict to which inflectional class a noun will belong based on formal properties, like morphological or phonological information. This means that there is not a similarity in the phonological or morphological shape of the forms inside the same class, or a possible phonological or morphological characteristic that speakers could rely on in order to derive which noun belongs to which class. Inflectional classes in BP are, then, considered to be arbitrary.

However, there is a general pattern that can be extracted from the relation between gender and theme vowels. In BP most nouns ending in *-o* are masculine, whereas most nouns ending in *-a* are feminine. That the vowels *-o* and *-a* do play a role in gender marking in BP is very clear when we look at the determiner system, for example. A determiner is unambiguously mapped to *a* when the noun is feminine, and

unambiguously mapped to *o* when the noun is masculine.

A very well-known fact about theme vowels in BP is that they do not trigger agreement. There is no rule that requires nouns and adjectives inside the same DP to belong to the same inflectional class. Unlike gender, theme vowels in BP are considered to be syntactically inactive.

- (1) (a) a            trib-o            bela  
           det(f) trib-**classI**(f) beautiful-**classII**(f)  
           “the beautiful tribe”
- (b) o            planet-a            belo  
           det(m) planet-**classII**(m) beautiful-**classI**(m)  
           “the beautiful planet”

As can be seen in the above data, a mismatch between the class of the adjective and the class of the noun has no consequences at all for the grammaticality of the sentence. In fact the three main properties highlighted above in the BP system have been cross-linguistically associated with theme vowels, as systematized below (see Bermúdez-Otero 2008).

- (2) Inflectional Class in BP: a summary
- (a) Inflectional classes are arbitrary.
  - (b) Inflectional classes are meaningless.
  - (c) Inflectional classes are syntactically inactive.

Gender, on the other hand, is said to contrast at some level with all those properties: gender is not entirely arbitrary and meaningless, at least when it comes to masculine and feminine pairs, for example. Also, gender is considered to be syntactically active, once it participates in agreement relations and, finally, it is possible to find masculine and feminine nouns in all different classes. The relation between gender and inflectional class, then, is far from being a clear one, and that is what our system intends to clarify.

### 3. Previous Accounts

As we have seen in the BP nominal system, the unpredictability of theme vowels is related to the fact that they cannot be deduced on the bases of morphological, semantic, phonological, or other formal features. This has been shown in a variety of languages (see Alexiadou and Müller [2005] for Russian, Greek, and German, for example). In order to deal with this property, a traditional approach is to say that inflectional classes

are diacritics in the root/stem. This diacritic will assure that the right phonological ending will be paired with the right root.

(3) Theme vowels are diacritics on roots

Membership in one of the conjugation classes is an arbitrary property of the roots that appear in the Latin verbal system. The simplest implementation of this fact involves specifying each Root for a diacritic feature that encodes membership in a specific class:  $\sqrt{\text{AUD}}$  [IV]. (Embick and Halle 2005, 46)

Nevertheless, class diacritics on the root have been shown to be theoretically and empirically undesirable. Empirically, it is not rare to find cases in which the very same root surfaces with different final vowels.

|     |     |                      |         |          |
|-----|-----|----------------------|---------|----------|
| (4) | (a) | mat-o                | mat-a   | mat-e    |
|     |     | root-fv              | root-fv | root-fv  |
|     |     | “bush”               | “woods” | “herb”   |
|     | (b) | val-o                | val-a   | val-e    |
|     |     | root-fv              | root-fv | root-fv  |
|     |     | “parapet of a ditch” | “ditch” | “valley” |

Theoretically speaking, positing the existence of inflectional diacritics on roots weakens the acategorical status of the root in frameworks that assume acategorical roots, for example Distributed Morphology, because a diacritic of that nature is a clue to the category the relevant root may assume (see Acquaviva 2008).

The syntactic inertia attributed to inflectional classes is related to the fact that they do not seem to influence the syntactic derivation in any way: they do not trigger agreement, and there seem to be no cases in which a particular formal operation is restricted by inflectional class affiliation. Besides being syntactically inactive, theme vowels are considered to carry no meaning. These two properties together led some authors to propose that theme vowels are relevant only on a morphological level. The morphological account of theme vowels splits, however, into two different avenues of approach. One of them considers morphology to be a post-syntactic component (see Harris 1999; Oltra-Massuet 1999; Alcântara 2003; 2010), whereas the other one consider morphology to happen before syntax (see Alexiadou and Müller 2005).

(5) Post-syntactic morphology

[A] theme vowel is inserted in the morphology as a result of a well-formedness condition on syntactic functional heads. (Oltra-Massuet 1999, 12)

## (6) Pre-syntactic morphology

[Inflectional features] are uninterpretable in syntax and act as probes on stems, with matching inflection markers as goals, and thus trigger morphological Agree operations that merge stem and inflection marker before syntax is reached. (Alexiadou and Müller 2005, 1)

Both avenues of approach sketched above assume that inflectional class features are somehow necessary in morphology, but not in syntax. The approaches in (5) are developed under the theoretical framework of Distributed Morphology (Halle and Marantz 1993; Marantz 1997; a.o.), which allows terminal nodes to be inserted after syntax. Crucially, elements inserted after syntax may not play any syntactic role and may not influence meaning, since they are inserted after the derivation splits between PF and LF branches. Under this state of affairs, it is assumed that an inflectional class node is inserted after syntax in order to fulfill a kind of morphological well-formedness requirement. On the other hand, in pre-syntactic approaches to morphology, class features are considered to be probes that enter in Agree relations with inflectional markers. This Agree operation is pre-syntactic, and it is responsible for eliminating class features from the derivation, since class features are considered uninterpretable in the syntactic component.

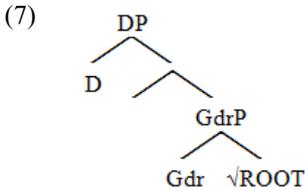
The approaches in (5) and (6) are not without problems. As Alexiadou and Müller (2005) have argued, the post-syntactic insertion of a terminal node is at odds with the Inclusiveness Condition (Chomsky 1995), which states that the output of a system does not contain anything beyond its input. It is also fair to say that it is not clear at all what a morphological well-formedness condition means. Positing the addition, in morphology, of a terminal node to host theme vowels is not very explanatory. Also, if theme vowels are not present before the derivation splits between PF and LF, the fact that the final vowel does somehow contribute to meaning is completely lost. The contribution to the final vowel to meaning can be observed in minimal pairs like *barca* “barge” vs. *barco* “boat,” for example, which definitely have different meanings.

Regarding the approaches in (6), it is not easy to empirically assume that morphology comes after syntax. As extensively noted by Sauerland (1996), there are cases in which properties that are not specified in the output of morphology are clearly accessible to syntax. In fact, words are often morphologically underspecified with respect to properties that are relevant to syntax. Since not all properties that are relevant to syntax are expressed morphologically, if one assumes that morphology comes before syntax, there is a mismatch that needs to be explained. In the system we adopt throughout this work, morphology is post-syntactic.

In the next section we develop a new system to deal with inflectional class in BP. Importantly, however, we depart from all the approaches sketched above in crucial aspects.

## 4. The System

We propose, in this section, that inflectional class is not a primitive in the BP nominal system. More specifically, we argue that the split between gender and inflectional class is both unrevealing and misleading. In this sense, we unify both notion of gender and class by saying that they are phonological exponents of the gender head. The basic syntactic structure of our system is the following:



The gender head is part of the Extended Projection of the Noun, and it is responsible for triggering agreement between the noun and its modifiers. We are assuming a theoretical view in which roots do not have any internal grammatical value and are devoid of any syntactic feature (see Borer 2013). This being so, roots cannot project or select for complements. In Bare Phrase Structure terms (see Chomsky 1995), roots are at the same time minimal and maximal projections: they are not the projection of any head and they do not project further in the structure. The label resulting from merger of the root and the gender head has to be gender itself. Also, under the impoverished view of roots adopted here, we propose that the functional gender head is responsible for selecting the appropriate root. With respect to meaning, we subscribe to the view that roots are meaningless in isolation. This being so, meaning is determined by well-defined local domains established in the syntactic structure (see Borer 2013).

It is important to remark that we are considering gender agreement to be a syntactic process. An alternative approach would be to consider gender a purely morphological element that is inserted after syntax, as a dissociated morpheme in the sense of Distributed Morphology (see Embick and Noyer 2001). This hypothesis is rejected based on Picallo's (2007) argument that gender may have effects at the LF component, which is completely unexpected if it is to be inserted after the derivation split between FL and PF. What Picallo (2007, 3) shows is that, in Catalan, gender affects variable-like readings:

- (8) (a) 

|       |                      |                    |       |     |                        |                   |
|-------|----------------------|--------------------|-------|-----|------------------------|-------------------|
| Quand | un                   | venedor            | té    | una | calaixera <sub>i</sub> | la <sub>i</sub> / |
| when  | a                    | seller(m)          | has   | a   | drawer chest(f)        | it(f,sg)          |
|       | eI <sub>*i/j</sub> / | ho <sub>*i/h</sub> | ven   |     |                        |                   |
|       | it(m,sg)             | it(n)              | sells |     |                        |                   |

“When a seller has a drawer chest, he sells it.”

- (b) Quand una venedora té un armari<sub>i</sub> la<sub>\*i</sub>/ el<sub>i</sub>/  
 when a seller(f) has a closet(m) it(f,sg) it(m,sg)  
 ho\*<sub>i/h</sub> ven  
 it(n) sells  
 “When a seller has a closet, she sells it.”

In order for the clitic pronouns to have a bound reading, they have to agree in gender with their antecedents. The interesting fact is that, according to the author, the lack of gender agreement does not lead to ungrammaticality, but to an interpretation of the clitics as free. If this is so, it cannot be the case that gender is an added on the way to the PF interface, as is the case with so-called Dissociated morphemes. Picallo (2007, 4) also brings evidence from French of the syntactic presence of gender. The relevant data includes cases in which overt gender agreement is related to a movement operation:

- (9) (a) Quelle chaise as- tu *t* repeinte *t*  
 which(f) chair(f) have you repainted(f)  
 “Which chair have you repainted?”
- (b) Les chaises que Paul a repeintes *t*  
 the(f,pl) chair(f,pl) that Paul repainted(f,pl)  
 “The chairs that Paul has repainted.”

In the French data above, the DPs *quelle chaise* in (9a) and *les chaises* in (9b) have been displaced from their base position. Interestingly, this movement is related to the presence of overt agreement in the past participle. In this sense, when the relevant DPs are in their base position, no such agreement effect is found.

- (10) (a) Tu as repeint la chaise  
 You have repainted the(f) chair(f)  
 “You have repainted the chair.”
- (b) Paul a repeint les chaises  
 Paul have repainted the(pl) chair(f,pl)  
 “Paul has repainted the chairs.”

In (10a), there is no agreement between the participle and the feminine gender of *chaise*. The same is true for (10b), in which the participle does not vary in either gender or number, regardless of the presence of the feminine plural *chaises*. Crucially, there is also no displacement related to the relevant nouns.

A parallel correlation between displacement and gender agreement is also found in Catalan, as shown by Picallo (2007, 4):<sup>1</sup>

- (11) (a) (Aquesta pel·lícula) ja l' has vista?  
 This movie(f) already it(f) have (you) seen(f,sg)  
 "This movie, have you already seen it?"
- (b) (Aquestes pel·lícules) ja les has vistes?  
 these movies(f,pl) already them(f) have (you) seen(f,pl)  
 "These movies, have you already seen them?"
- (c) Ja has vist(\*a) aquesta pel·lícula  
 already have (you) seen(\*f) this movie(f)  
 "Have you already seen this movie?"

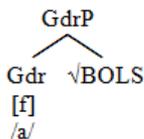
As for the French data, Picallo says that if DPs are kept in their thematic position, no overt agreement shows up in the participle form. We take the phenomena shown in (8)–(11) as an indication that gender agreement is indeed a syntactic process.

Returning to the BP data, we have seen that the most general picture in the nominal system is the following: *-a* is the default feminine marker and *-o* is the default masculine marker. This state of affairs is fairly clear from the well-known fact that in BP, most nouns ending in the vowel *-a* are feminine, while most nouns ending in the vowel *-o* are masculine. Let us suppose, then, that *-o* and *-a* are the default phonological exponents of the gender head. Assuming that syntactic terminals are devoid of phonological content (Late Insertion), the system is very straightforward: if the gender head (Gdr) has a [feminine] feature in syntax, then the phonological exponent *-a* is inserted, if the gender head has a [masculine] feature in syntax, then the phonological exponent *-o* is inserted.

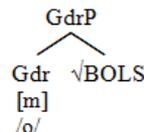
(12) Default Vocabulary Items for the Gdr head

- $[f]_{\text{gender}} \leftrightarrow a$   
 $[m]_{\text{gender}} \leftrightarrow o$

(13) Output: *bolsa* "purse(f)"



(14) Output: *bolso* "pocket(m)"



1 The author does not provide the non-agreeing versions of the Catalan data in (11b).

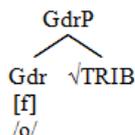
However, as we have seen earlier, the general pattern is not without exceptions. In fact, the existence of feminine nouns ending in *-o* and masculine nouns ending in *-a* is one of the arguments for the traditional split between what is gender and what is theme vowel. These cases clearly deviate from the general pattern. To account for them, let us emphasize the separation between what is syntactic (the agreement features) and what is phonological (the actual realization of the final vowel). We do that by assuming, as we did before, that the phonological content of syntactic heads is inserted late. It is clear that unexpected patterns, like masculine nouns in *-a* and feminine nouns in *-o* have to be listed somewhere. We propose, then, that the final unexpected vowels are just a matter of phonological insertion. This means that the non-default patterns are nothing more than “special” phonological exponents of the gender head. By special, we mean contextually specified with root information. Contextual specification is the information that appears after the slash in the VI instruction. The contextual specification states the conditions under which the insertion of the relevant VI is licensed.

(15) Contextual specification in Vocabulary Items

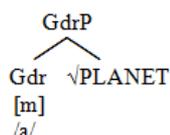
$[m]_{\text{gender}} \leftrightarrow a / \{\sqrt{\text{PLANET}}; \sqrt{\text{MAP}}; \sqrt{\text{PROBLEM}}; \text{etc.}\}$

$[f]_{\text{gender}} \leftrightarrow o / \{\sqrt{\text{TRIB}}; \sqrt{\text{LIBID}}; \sqrt{\text{VIRAG}}; \text{etc.}\}$

(16) Output: planeta “planet”



(17) Output: tribo “tribe”



VIs compete for insertion into the terminal nodes generated by syntax. One of the important aspects of Vocabulary Insertion is that it is subject to the Subset Principle (Halle 1997). All things being equal, the exponent that realizes a Maximal Subset of the features on the relevant syntactic terminal node must win the competition. A consequence of this principle is that the existence of a more specific VI overrides the application of a more general one. Crucially, the Subset Principle as it is stated does not allow us to conclude that the VIs in (15) are more specific than the VIs in (12), since both groups realizes the same number of features. However, contextual specification does have to be taken into account in order to compare specificity. If that is true, it becomes clear that, in the context of the relevant roots, the VIs in (15) are more specific than the VIs in (12).

In this sense, in the context of the roots  $\sqrt{\text{PLANET}}$  or  $\sqrt{\text{MAP}}$ , for example, the exponent *-a* is the most specified and it wins the competition over the other VIs. In the context of the roots  $\sqrt{\text{TRIB}}$  or  $\sqrt{\text{LIBID}}$ , on the other hand, the VI *-o* is more specified, and as such it wins the competition. Crucially, in the absence of any root that is relevant

for the contextual specification, the VIs in (15) lose the competition by virtue of being over specified: they contain information that is not present in the syntactic derivation. As a consequence, the default VIs are phonologically realized.

In a split approach for gender and theme vowel, there is a valid generalization that has been noticed in the relation between the two notions: whenever there is a mismatch between gender and class, the one that gets realized is class and not gender. In a split approach for gender and inflection class, it is possible to account for that by saying that class somehow has hierarchal precedence over gender. If there is a masculine noun ending in *-a*, like *mapa*, for example, the final *-a* is considered to be class and not gender, because class outranks gender. This is, of course, not a possible statement in our unified system. In our account, the only relevant generalization is that on the presence of a more specified VI for the relevant context, the default exponents cannot be inserted. This is no different from the following way to account for irregular plural formation in English, for example.

(18) Plural in English

(a)  $[-\text{sing}]_{\text{num}} \leftrightarrow s$

(b)  $[-\text{sing}]_{\text{num}} \leftrightarrow \emptyset / \{\sqrt{\text{SHEEP}}; \sqrt{\text{FISH}}; \text{etc}\}$

(c)  $[-\text{sing}]_{\text{num}} \leftrightarrow \text{ren} / \{\sqrt{\text{CHILD}}; \sqrt{\text{BROTHER}}\}$

The VI in (18a) is the default, while those in (18b–c) have contextual specifications containing the roots to which they apply. In the context of  $\sqrt{\text{SHEEP}}$ , then, (18b) is the most specified VI, while in the context, of  $\sqrt{\text{CHILD}}$ , on the other hand, (18c) must win the competition. In the absence of a contextually listed root, the default VI is inserted. Crucially these are all different phonological realizations of the same syntactic head. It is not at all necessary to stipulate à priori that the relevant roots are marked with diacritics to ensure the right plural ending to match with the right root.<sup>2</sup>

In the same sense, our claim is that it is not necessary to mark roots in BP just to ensure that they match with the right phonological ending. It is very important to highlight that no relevant generalization is being lost by discarding class features as “I, II” and so on, once there is nothing but phonological exponence that groups nouns together.

2 An anonymous reviewer points out that an alternative analysis would be to assume that the lexicon stores stems with the respective final vowels, and not roots, which is essentially the proposal put forth in Bermúdez-Otero (2013). This approach immediately loses the general pattern that most feminine nouns end in *-a*, and that most masculine nouns end in *-o*. Also, all the cases in which the same root surfaces in different inflectional classes would be forced to have duplicate entries.

## 5. But, after All, What Is Gender?

In the preceding sections we have argued that gender and inflectional classes are better analyzed in a unified way. Syntactically, it was proposed that they both occupy the gender head.

But there is a very important question which was not addressed yet: what is gender? A very clear intuition is that gender interpretation is closely related to the existence of masculine-feminine pairs. Also, the existence of these gendered, paired nouns seems to be very closely related to animacy. Let us compare the two sets of data below:

(19) Masculine-feminine pairs: animate nouns

- |                                       |                                     |
|---------------------------------------|-------------------------------------|
| (a) <i>o menino</i> “the boy”         | <i>a menina</i> “the girl”          |
| (b) <i>o aluno</i> “the male student” | <i>a aluna</i> “the female student” |
| (c) <i>o cachorro</i> “the male dog”  | <i>a cachorra</i> “the female dog”  |
| (d) <i>o gato</i> “the male cat”      | <i>a gata</i> “the female cat”      |

(20) Masculine-feminine pairs: inanimate nouns

- |                                 |                            |
|---------------------------------|----------------------------|
| (a) <i>o bolso</i> “the pocket” | <i>a bolsa</i> “the purse” |
| (b) <i>o mato</i> “the bush”    | <i>a mata</i> “the woods”  |
| (c) <i>o barco</i> “the boat”   | <i>a barca</i> “the barge” |
| (d) <i>o palmo</i> “the span”   | <i>a palma</i> “the palm”  |

It seems quite clear that the semantic contrast between the feminine and masculine nouns in (19) is quite different from the one found between the nouns in (20). Crucially, in the first group, it is possible to precise the contribution of gender to the interpretation. Roughly, the gender interpretation in (19) corresponds to the biological sex of the involved nouns. On the other hand, the meaning contrast between the members of the second group is much bigger than that, and also very hard to be defined. It is also important to remark that, differently from the cases in (20), no animacy effect can be associated to the nouns that form the pairs in (20). Put together, the big contrast in meaning, and the absence of any sort of animacy effect seem to be showing that the cases in (20) are to be treated differently from masculine-feminine contrast in *gato* “male cat” and *gata* “female cat,” for example.

A possible way to deal with these two different gender contrasts is to say that, in the examples of the type *gato* “male cat” vs. *gata* “female cat,” the final vowel is gender, whereas in the examples of the type *bolso* “pocket” vs. *bolsa* “purse,” the final vowel is indicating inflectional class. Nevertheless, the system developed in the last section does not allow for this kind of split analysis between gender and inflectional class. That is so because we argued for a unified analysis for them: gender and inflectional class are, in our system, the very same thing.

The intuition that gender is related to animacy has already been pointed out in the literature. For example, Harris (1991) proposes that there is a specific rule responsible by “cloning” the lexical features of an entry in the presence of a [human] feature, in order to deal with the fact that there usually is a male and a female counterpart associated with the relevant noun. The “cloning” rule works in the following way: if a noun stem has the specification [human] without any specification of sex, then “Human Cloning” will apply by replacing the relevant lexical entry with a pair of entries that are identical to the original one, except for the addition of the specification “male” in one of them, and of the specification “female” in the other one.

The conception behind Human Cloning is that the [human] feature is the trigger for a masculine-feminine pair formation. However, this rationale seems to be backwards if we look at the following BP data:

- (21) (a) A      mes-a      e      o      mes-a      viveram      felizes  
           det(f)    table-fv    and    det(m)    table-fv    lived(pl)    happy(pl)  
           para      sempre.  
           for        ever  
           “The female table and the male table lived happily ever.”
- (b) A      panel-a      e      o      panel-a      se      casaram  
           det(f)    pan-fv      and      det(m)    pan-fv    refl.    married  
           em      um      castelo.  
           in      a      castle  
           “The female pan and the male pan got married in a castle.”

In (21) we find non-animate nouns, which are being transformed in animate nouns because the gender feature is being played with. The relevant non-animate nouns are *mesa* “table” and *panela* “pan,” which are both feminine in BP and have no masculine pair in the non-animate reading. The creation of a masculine-feminine pair, which can be seen in the different forms assumed by the determiners, is leading to an animate interpretation of the relevant nouns. It is not the case that an animate feature on the stem forces the formation of a pair masculine-feminine. The opposite seems to

be happening: it is because a pair has been formed that the animate interpretation is forced. If this is so, then, animacy is a consequence of gender inflection and not the trigger of it.<sup>3</sup> Crucially, the Human Cloning rule does not predict that a masculine-feminine pair can be formed on the basis of inanimate nouns.

The question, then, is how to formalize the idea that gender is so closely related to pair formation. In order to do so, it was proposed in this paper that there are three possible feature specifications for the gender head: [masculine], [feminine], and a pair containing both features [[masculine], [feminine]].

It is important to keep in mind that the root has no interpretation on its own. This being so, both the isolated features and the pair of features contribute to interpretation. The idea is that the semantic contribution of the isolated specification, that is [masculine] or [feminine], is null, since it does not encode any contrast. In this sense, what is traditionally known as inflectional class is no more than the consequence of a syntactic context in which the gender head is specified with either an isolated [masculine] or an isolated [feminine] feature. On the other hand, when the gender head is doubly specified, it contributes to meaning in a transparent way, since it codifies a contrast. This double specification is what generates the interpretation of paired nouns, as *gata* “female cat” and *gato* “male cat,” for example. Consequently, what is traditionally known as gender is no more than the consequence of a syntactic context in which the gender head is specified with a pair of features. Interestingly, a new definition of animacy is provided by the system. In this redefinition, animacy is not a primitive notion, but it is derived from the syntactic structure, more specifically, from the double specification of the gender head.

As we said before, syntactically, the feature specification on the gender head is responsible for triggering gender agreement. The [masculine] feature on the gender head unambiguously maps the determiner to *o*, while the [feminine] feature unambiguously maps the determiner to *a*. What happens, then, when the gender feature is doubly specified? Simply put, whenever the gender head has a pair of features, the determiner can vary in gender and the interpretation associated with that variation will be male *x* when the determiner is *o*, and female *x* when the determiner is *a*, *x* corresponding with the noun the determiner applies to. Phonologically, just one of the features can be actually realized, but it is very plausible to propose that the non-realized feature stays as available background information in the sense that talking about a female *x* implicates the existence of a masculine *x*.

3 An anonymous reviewer pointed that the argument based on (21) is dubious because one could say that the presence of animacy forced the speaker to use the article. Nevertheless this cannot be the case, since, generally speaking, there is no direct relation between animacy and the use of the article. In other words, it is quite possible to have an animate noun with no realized article. Our proposal unifies both the “unexpected” animacy of the nouns in (21), and the “expected” animate interpretation of the nouns that Harris (1991) tries to capture with the Human Cloning rule.

## 6. Final Considerations

In this work we investigated the relation between gender and noun class. The traditional division between the two concepts was abandoned in favor of a unified analysis. More specifically, it was proposed that syntactically, both occupy the head of a functional phrase headed by gender, which is part of the extended projection of the noun. Semantically, the idea is that a double specification containing a pair of features [[masculine], [feminine]] on the gender head encodes contrast, and contributes to meaning in a very transparent way. On the other hand, the isolated features [masculine] or [feminine] are not contrastive, and in this sense their contribution to meaning is opaque. Finally, phonologically, it was proposed that the VIs competing to be inserted in the gender head can either be default or contextually specified. The ones that are contextually specified win the competition over default exponents.

## Acknowledgements

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# Bare Predicate Nominals in German

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**Abstract:** The paper develops an integrated analysis of the reasons of the possible absence of determiners in singular predicate nominals that refer to professions and other roles of humans in German. Previous analyses suggest that predicate nominals occurring with an indefinite article denote kinds. The indefinite article is needed to shift the kind to its instances. Bare predicate nominals, on the other hand, have previously been analyzed as entities of a special ontological type (capacities) or as denotations of well-established activities. I evaluate the latter account and suggest on its basis a new analysis that can better capture the characteristics of bare predicates such as reference to well-established activities, restrictions on adjectival modification, and number neutrality. I propose that bare NPs are predicates that designate social roles. Like thematic roles, social role predicates relate events of a special type to their participants. However, social role predicates differ from thematic roles since they apply only to participants in well-established or institutionalized event kinds associated with particular kinds of humans.

**Keywords:** bare noun; reference to kinds; predication; DP-structure; copula sentence.

## 1. Introduction\*

As observed in German, as well as in French, Dutch, Brazilian Portuguese, and other languages, predicate nouns in a copula sentence with a human subject may occur with

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or without an indefinite article (1a–b).<sup>1</sup> A good example is profession nouns, which commonly occur bare as shown in (1a), but can take the indefinite article if they have a figurative meaning, as in (1b). Some nouns, however, occur with an indefinite article and do not allow the bare use (2).

- (1) (a) Udo ist Schauspieler. [profession]  
       Udo is actor
- (b) Udo ist ein Schauspieler. [behavior]  
       Udo is an actor
- (2) Udo ist \*(ein) Mann.  
       Udo is a man

The post-copular NP in (1a–b) and (2) is non-referential and denotes a set of individuals / a property of the type  $\langle e, t \rangle$  (Partee 1987). Evidence for the nominal predicates in (1) and (2) all being of the type  $\langle e, t \rangle$  comes from their conjoinability with APs, since it has been commonly assumed that constituent conjunction requires identical types and APs are generally of the type  $\langle e, t \rangle$  (Partee 1987, 119). Disjunction as in (3b) can be assumed to have the same effect.

- (3) (a) Udo ist Schauspieler und hier sehr populär.  
       Udo is actor and here very popular
- (b) Er ist entweder ein Betrüger oder krank.  
       he is either a swindler or ill  
       [*Frankfurter Allgemeine Zeitung* 8.10.2013: Bischof Tebartz-van Elst]

Since the nominal predicate is non-referential, the copular sentence can be identified as a predicational sentence, i.e., it involves a predication relation.<sup>2</sup> In a predicational

1 In this paper I concentrate on the bare use of NPs which stay in opposition to NPs with an indefinite article. Articleless NPs, such as *Gewinner* “winner” in (i), are excluded from the analysis. Such NPs are inherently definite and are possible even with non-human subjects.

(i) Die Mercedes A-Klasse war (der) Gewinner in der Kategorie „Lieblingsauto“.  
       the Mercedes A-class was the winner in the category “my favorite car.”

2 Predicational sentences can be identified by the choice of the *wh*-word in questions. They answer questions with *was* “what” and have a non-referential post-copular NP (i). By contrast, identificational sentences answer questions with *wer* “who” and have a referential post-copular NP denoting an individual (ii).

sentence the property denoted by the predicate NP is ascribed to the subject referent. The intuitive difference between the variant with the singular bare NP (henceforth BNP) in (1a) and the indefinite NP (henceforth INP) in (1b) and (2) is that in sentences with BNPs the predicate noun predicates about one aspect of the individual such as his/her profession, social status, etc. (see also Mari and Martin [2008] for French). This aspect can be specified by a PP such as *von Beruf* “by profession” (4a), or *von der Nationalität* “by nationality,” etc. In contrast to BNPs, INPs predicate salient or inherent properties of the subject which “define” the subject individual as a whole and assign it to some category (cf. Roy 2013). For this reason INPs are incompatible with PPs such as *von Beruf* “by profession” that restrict predication to some aspect of the individual (4b).

- (4) (a) Udo ist Schauspieler von Beruf.  
       Udo is actor by profession
- (b) Udo ist ein Schauspieler \*von Beruf.  
       Udo is an actor by profession

The central aim of the paper is to give an account of the differences between BNPs and INPs in German at the syntax/semantics interface. The general idea will be the following: the nominal head of BNPs has a different denotation than the nominal head of INPs. The head of INPs denotes a kind. The head of an INP is an intact noun. I use the term “intact noun” for nouns that have both the nominal category features gender and number. Nouns that lack one of these features will be called “deficient” in this paper. The nominal head of BNPs is deficient since it bears no number features and resembles adjectives in this respect. Like adjectives, it does not denote a kind but just a property. Like properties designated by adjectives, which are sortally restricted to colors, sizes, etc., properties designated by deficient nouns are sortally restricted as well, but their sort is that of social roles. I propose that social roles can be represented as binary predicates. Like thematic roles, social role predicates relate events to their participants. They differ from thematic roles since they apply only to participants in well-established or institutionalized event kinds.

The paper is organized as follows: in Section 2 I will introduce some distinctions between BNPs and INPs that an analysis should account for, and I will then present two

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- (i) (*Was* ist Udo? “What is Udo?”)  
       Udo ist (ein) Schauspieler. [predicational]  
       Udo is (an) actor
- (ii) (*Wer* ist Udo? “Who is Udo?”)  
       Udo ist \*(ein) Schauspieler. [identificational]  
       Udo is (an) actor

accounts of these distinctions suggested in the literature in Section 3. After discussing some problems relating to these accounts I will propose a new integrated analysis of BNPs and INPs in German in Section 4 and discuss its advantages.

## 2. Preliminary Observations

As observed in the literature on BNPs in different languages (for Dutch, see de Swart et al. [2007]; for French, see Roy [2013]) and specifically in German (Geist 2006; Hallab 2011), nouns referring to particular roles in society are regularly used without the indefinite article, see Class A in (5a). I will refer to this class as “role nouns.” With nouns of Class B in (5b) denoting subsets of humans such as *Mann* “man,” inherent properties such as *Genie* “genius” and evaluative properties such as *Feigling* “coward” the indefinite article cannot be omitted, cf. (6a) vs. (6b). I will refer to such nouns as “class nouns.”

(5) (a) **Class A (role nouns)**

professions (*Übersetzer* “translator”), hobbies (*Alpinist* “alpinist”), functions (*Minister* “minister”), nationalities (*Italienerin* “Italian”), occupations (*Student* “student”), religious denominations (*Katholik* “catholic”) . . .

(b) **Class B (class nouns):** *Mann* “man,” *Genie* “genius,” *Held* “hero,” *Idiot* “idiot,” *Trunkenbold* “drunkard,” *Feigling* “coward,” *Heulsuse* “crybaby,” *Riese*, *Gigant* “giant,” *Zwerg* “dwarf,” *Engel* “angel” . . .<sup>3</sup>

(6) (a) Udo ist Übersetzer / Alpinist. Class A nouns  
Udo is translator/ alpinist

(b) Udo ist \*(ein) Mann / \*(ein) Genie. Class B nouns  
Udo is a man/ a genius

Why do Class B nouns need an indefinite article in the predicative position while Class A nouns do not? Matushansky and Spector (2005) characterize Class A nominals as non-scalar, Class B ones as scalar. They assume that a Class B noun as a head of an INP

<sup>3</sup> There are language-specific differences in the use of some nouns as a role noun or a class noun. An example is the noun *smoker*, which in German is normally used bare, while in Dutch it needs an indefinite article (de Swart et al. 2007, 203), i.e., it belongs to class nouns. Another example is the case of some kinship nouns such as *brother*, which cannot occur bare in German, but can in Italian (Zamparelli 2008, 106).

Besides the names of subkinds of humans, such as *Frau* “woman” and metaphorically shifted nouns such as *Engel* “angel,” Hallab (2011, 130) identifies two additional subclasses of INPs with “shifted” meaning: evaluative proper names such as *ein Don Juan*, and swear-words for humans such as *ein Arschloch* “asshole.”

has a degree argument which has to be bound by the indefinite article. Thus, *genius* as a Class B noun is scalar because a person is a genius to some degree. This explanation seems plausible for Class B nouns. However, as Berman (2009) has shown, some Class A role nouns in German are compatible with degree modifiers and can receive a scalar interpretation as well.

- (7) Morgens bin ich ganz Papa.  
 In-the-morning am I completely daddy  
 “In the morning I’m all daddy.” (Berman 2009, 101)

Thus, the feature of scalarity does not help to capture the difference between BNPs and INPs adequately. This suggests that the right semantic characterization of Class A and B predicate nouns has not been found yet. However, descriptions of the distinguishing features of Class A (BNPs) and Class B (INPs) in different languages are already available. According to the literature on Dutch and different Romance languages (Munn and Schmitt [2005]; de Swart et al. [2007]; Zamparelli [2008], among others), BNPs differ from INPs in at least three features: restricted meaning, restrictions on adjectival modification, and number neutrality. It can be shown that German BNPs also display these features.

## 2.1 Restricted Meaning: Reference to Social Roles

BNPs have a more literal and restricted meaning. They name *socially established roles*, i.e., institutionalized or typical roles established in a social community (de Swart et al. 2007). In (8a) *Athlet* “athlete” is socially established in the sense that it refers to a profession. The predicate *Metzger* “butcher” is similar. (8b) describes unusual circumstances under which the subject referent is a surgeon and has an additional profession as a butcher.

- (8) (a) Er ist Athlet. [profession]  
 He is athlete  
 (b) Dieser Chirurg ist auch Metzger. [profession]  
 this surgeon is also butcher

By contrast, the meaning of the corresponding INPs in (9a) and (9b) is figurative or expressive.

- (9) (a) Er ist ein Athlet. [behavior or athlete-like appearance]  
 He is an athlete

- (b) Dieser Chirurg ist ein Metzger. [ability]  
 This surgeon is a butcher

The predicate *ein Athlet* refers to the behavior or to the appearance normally associated with professional athletes. *Ein Metzger* merely evokes an expressive interpretation that when working as a surgeon the subject individual acts in a cruel manner. Thus, the predicate NP displays the subjective attitude of the speaker towards the personal abilities of the individual; it denotes more of an *evaluative property*. This evaluative property is stereotypically associated with holders of the institutionalized role designated by the BNP. The restriction to institutionalized roles is closely related to the feature [+ human]: BNPs in different languages can only be predicated of human subjects (Matushansky and Spector 2005; de Swart et al. 2007). If the subject is non-human, as in (10), the bare use of predicate nouns is excluded:

- (10) Mein Handy ist auch \*(ein) Wecker.<sup>4</sup>  
 my mobile is also (an) alarm clock

## 2.2 Restricted Modifiability

BNPs cannot be modified by evaluative adjectives that typically operate at the level of ordinary objects, such as *jung* “young” or *bekannt* “famous” (Zamparelli [2008], among others).

- (11) \*Udo ist junger/bekannter Architekt.  
 Udo is young/famous architect

However, as (12a–b) show, the modification of BNPs is not completely impossible. Some adjectives can occur with BNPs.

- (12) (a) Udo ist technischer Architekt/ beedigter Übersetzer.  
 Udo is technical architect sworn translator
- (b) Udo ist freiwilliger Helfer/ starker Raucher.  
 Udo is voluntary helper heavy smoker

Adjectives such as *technisch* “technical” in (12a) that contribute to the formation of a subkind of architects have been called relational. Adjectives such as *freiwillig* “voluntary” in (12b) are similar but they seem to apply to events: someone who is a voluntary helper helps voluntarily. Thus, *freiwillig* contributes to the formation of a subkind of

<sup>4</sup> The bare use of NPs is possible with non-human subjects if they are inherently definite, cf. fn. 1.

helping. To distinguish adjectives such as *frewillig* “voluntary” in (12b) from other types, I will call them event-related.

The restrictions on modification observed in BNPs are not found for INPs. The latter can be modified by evaluative adjectives.

- (13) Udo ist ein junger/bekannter Architekt.  
He is a young/famous architect

### 2.3 Number Neutrality

The literature on BNPs in different languages points to BNPs having a deficient number feature (de Swart et al. [2007], among others). This deficiency is also attested in German. Singular BNPs can get a plural interpretation if the subject is a plurality of individuals (cf. also Berman [2009]).

- (14) (a) Beide Brüder wurden Ingenieur / Ingenieure.  
both brothers became engineer.SG engineer.PL  
(Duden 2009, 995)
- (b) Anna und Barbara wollen Ärztin / Ärztinnen werden.  
Anna and Barbara want doctor.FEM.SG doctor.FEM.PL become  
(Duden 2009, 995)

These data suggest that singular BNPs have no independent semantic specification for number but become specified by agreement with the subject. But what about INPs? They do not show number neutrality. If the subject is plural, the INP must also be in the plural, cf. (15):

- (15) Beide Brüder wurden \*ein Held / Helden.  
both brothers become a hero.SG heroes.PL

Table 1 summarizes the differences between BNPs and INPs.

| Distinctions                            | BNPs | INPs |
|---|------|------|
| <b>restricted meaning “social role”</b> | yes  | no   |
| <b>restricted modifiability</b>         | yes  | no   |
| <b>number neutrality</b>                | yes  | no   |

**Table 1.** Distinguishing features of BNPs and INPs.

In the next section I will show how some previous analyses account for these distinctions between BNPs and INPs.

### 3. Evaluation of Some Previous Analyses

#### 3.1 Bare NPs as Denotations of Capacities

The features distinguishing between BNP and INP predicates have been attested in different languages. One prominent analysis of BNPs and INPs which tries to explain these features was suggested by de Swart et al. (2007) for Dutch. The authors assume that the head nouns of INPs denote kinds. To account for the very restricted institutionalized meaning of BNPs they assume that bare nouns as heads of BNPs denote what they call “capacities.” Capacities are postulated as a separate ontological category similar to kinds. They are entities of the type  $e$ , like kinds, but are sortally distinct from kinds. The authors propose that capacities, like kinds, can be systematically mapped to sets of ordinary entities using a covert semantic operator CAP analogous to the Carlsonian realization operator REL (Carlson 1980). REL maps a kind to sets of individuals that belong to this kind (16a). By analogy to REL, the operator CAP in (16b) maps capacities to sets of individuals which have these capacities. Capacities can also be mapped to kinds by kind coercion. The subscript  $k$  indicates that the variable  $y$  ranges over kind-level individuals, while the subscript  $c$  indicates the capacity level.

(16) (a) REL:  $\lambda y_k \lambda x [\text{REL}(x, y_k)]$

(b) CAP:  $\lambda y_c \lambda x [\text{REL}(x, y_c)]$

Thus, REL and CAP are used to derive an  $\langle e, t \rangle$ -type predicate that can satisfy the selectional requirement of the copula in a predicational clause.

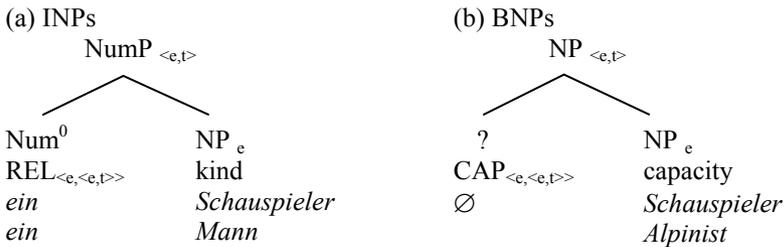
The semantic distinction between BNPs and INPs correlates with the syntactic distinction in the fine-grained DP structure. De Swart et al. (2007) assume the following extended projection for argument DPs where three layers are distinguished: DP, NumP, and NP.

(17)  $[_{DP} D [_{NumP} \textit{semantic number and REL operator} [_{NP} N^0 ]]]$  (de Swart et al. 2007)

The NP layer has no number specification. It has been assumed that semantic number information is associated with the Num projection (see Déprez [2005]; Farkas and de Swart [2003], among others). The Num head hosts semantically interpretable number features. Cross-linguistically, the Num head can be overtly realized by classifiers or by morphology on the noun. Semantically, the Num head projects the Carlsonian realization operator REL, which maps kind denotations to sets/properties of individuals, thus rendering the NPs countable. NumP is semantically a predicate of the type  $\langle e, t \rangle$ . De Swart et al. (2007), following Munn and Schmitt (2005), assume that the

indefinite article is the spell-out of the singular Num head. As a consequence, the absence of the indefinite article indicates the absence of the Num projection. Since BNPs are semantically number neutral they lack a Num projection and are just NPs. Such bare NPs denote capacities, entities of the type  $e$ . De Swart et al. propose that these BNPs are mapped to predicates of the type  $\langle e, t \rangle$  by the CAP operator, which by stipulation applies covertly.

(18) The structure of nominal predicates (de Swart et al. 2007) applied to German



The resistance of BNPs to modification by evaluative adjectives is attributed by the authors to the lack of a Num layer in BNPs.

Although this account provides an explanation for the three distinguishing features of BNPs and INPs summarized in Table 1, it has at least two problems. First, it remains unclear why the REL operator involved in the semantic structure of INPs must be spelled out by the indefinite article but the CAP operator involved in the semantic structure of BNPs, which performs a similar operation, is not spelled out. Second, as we have seen, the modification of BNPs is, although very restricted, possible with some adjectives. If the availability of a Num layer is a precondition for adjectival modification, as proposed in de Swarts et al. (2007), it is not clear why and how some adjectives we attested in (12) can still be integrated.

### 3.2 Bare NPs as Denotations of Well-Established Activities

The essential problem of de Swart et al.'s (2007) account lies in the assumption that heads of BNPs as names of capacities and heads of INPs as names of kinds are both of type  $e$ . If this is assumed it is not clear why in one case the indefinite article is needed as a shifter from  $e$  to  $\langle e, t \rangle$  whereas in the other case nouns can shift from  $e$  to  $\langle e, t \rangle$  without an article. Zamparelli (2008) suggests avoiding this problem by assuming that nominal heads of BNPs are not of the type  $e$ . He proposes that at least profession nouns as heads of BNPs refer to a set of individuals involved in abstract well-established activities. By “well-established” he means culturally established or institutionalized *events* typical of corresponding natural/well-established classes of people. Thus, well-established activities of people associated with profession nouns are typical activities while practicing the profession. That BNPs are associated with activities or, more

generally, with events, was also suggested by Munn and Schmitt (2005) and Roy (2013) for Romance languages and by Hallab (2011) for German.

According to the event analysis of BNPs nouns such as *Schauspieler* should be ambiguous. *Schauspieler*<sub>1</sub> as a head of an INP denotes a kind, while *Schauspieler*<sub>2</sub> as a head of a BNP denotes a set of agents in the well-established activity associated with this kind.

The two types of predicate NPs correspond to two types of copular sentences. Sentences with an INP such as (19a) are interpreted as a kind membership. Sentences with BNPs such as (19b) ascribe the subject a role in an event.

(19) (a) Udo ist ein Schauspieler.  
 Udo is an Actor  
 Udo  $\in$  actor'

(b) Udo ist Schauspieler.  
 Udo is Actor  
 $\exists e$  [acting-as-actor'(e) & Subj(e, Udo)] (Zamparelli 2008, 126)

The kind denotation and the activity denotation are related since the activity is essential for the corresponding kind.

At first glance the analysis of BNPs as denotations of well-established activities is attractive since it easily predicts the absence of the indefinite article. In this analysis, nouns as heads of BNPs are predicates right from the beginning. As such they satisfy the selection properties of the copula without any shifts. Moreover, the assumption of a relation to events is plausible for role nouns in German as many of them are morphologically derived from verbs denoting activities.<sup>5</sup> Furthermore, the restriction to human subjects is also accounted for, since only humans can serve as agents in well-established activities. However, upon further inspection the association of BNPs with events as tokens imposes serious problems.

**Problem 1: Some event-related modifiers.** Larson (1998) observes that evaluative adjectives such as *beautiful* or *good* can modify objects or events. (20) is ambiguous between a reading that entails that Olga as an individual is beautiful and one that entails that she dances beautifully. To account for this ambiguity he assumes that nouns can have an event argument. Larson posits that the nominal *dancer* applies to pairs of individuals ( $e, x$ ) such that  $x$  is the agent of  $e$ , where  $e$  is dancing.

<sup>5</sup> Most profession nouns are derived from verbs with the suffix *-er*: *Lehrer* “teacher,” *Verkäufer* “seller,” etc.

- (20) Olga is a beautiful dancer. (Larson 1998)
- (a)  $\lambda e$  [dancing(e, olga) & beautiful(olga)] [Olga is beautiful]
- (b)  $\lambda e$  [dancing(e, olga) & beautiful(e)] [dancing is beautiful]

In the case of object-related modification in (20a) the adjective applies to the referential object argument of *dancer* identified with Olga. In the event-related case (20b), the adjective applies to the event argument associated with *dancer*, which may become bound by a generic operator in the course of further derivation. Note that in German (20) cannot be translated with a BNP either in an object-related reading (20a) or in an event-related reading (20b). The indefinite article has to be used. Event-related adjectives such as *schnell* “fast” also cannot be combined with BNPs.

- (21) \*Olga ist gute Tänzerin / schnelle Tänzerin.  
 Olga is good dancer.FEM fast dancer.FEM  
 “Olga is a good / fast dancer.”

The reason seems to be that the BNP provides neither a referential object argument for object-related modification nor an appropriate event argument for modifiers *gut* and *schnell*. However, as was shown in (12b), other event-related modifiers can apply to it.

**Problem 2: Genericity.** The reference to particular event tokens represented in (19b) does not adequately account for the meaning of sentences with BNPs. The existential quantification over events suggests that an actual event must take place. However, BNPs are not directly associated with actual events: someone who is a teacher by profession needs not be engaged in actual teaching activities, cf. (22).

- (22) Hans ist Lehrer von Beruf, aber er arbeitet gar nicht als Lehrer.  
 Hans is teacher by profession but he works at-all not as teacher.  
 “Hans is a teacher by profession, but he doesn’t work as a teacher at all.”

There are objective criteria for calling someone *Lehrer* “a teacher” or *Chirurg* “a surgeon” with a bare noun: the person must have finished a particular education which qualifies him/her to be engaged in the respective institutionalized activities. Thus, profession nouns, like other role nouns, are institutional designations that do not depend on what the person actually does, but on the socially established role of that person. This role qualifies the person for being an agent in a well-established event kind corresponding with this role.

The fact that BNPs are not related to particular events but convey a generalization about events renders sentences with BNPs very close to generic or characterizing sentences such as those from Carlson given in (23):

- (23) Sally handles the mail from Antarctica. [an unfulfilled office function]  
This machine crushes up oranges and removes the seeds [said of a new machine  
that was later destroyed accidentally in shipping] (Carlson 1995, 231)

Such sentences are generalizations that are true even if the corresponding episodic instances do not take place. In this respect, sentences with BNPs and generic sentences are similar.

To conclude the discussion so far, there is something eventive in BNPs. However, the generic interpretation of BNPs makes it problematic to analyze them as related to particular event tokens. Also the exclusion of some event-related modifiers is not accounted for. Thus the previous eventive analysis of BNPs is in need of some adjustment. I will suggest in Section 4.2 that the abstraction away from the actual event in BNPs can be accounted for if we assume that they are related to event kinds rather than to particular events, and restrictions on modification arise from the requirement that these event kinds must be well-established.

Before I present my analysis of BNPs in German, some words must be said about INPs. I think that the analysis of de Swart et al. (2007) of INPs is on the right track and can also be applied to German: the head of the INP is a kind-denoting noun. The indefinite article as a head of NumP is needed to derive a property from it. Thus, INPs have a more complex syntactic structure than BNPs, and hence the latter are syntactically deficient nouns. We leave open the question of whether reference to events is involved in INPs, but see Geist (in prep.).

## 4. A New Analysis of Bare Predicate NPs

The evaluation of previous accounts in Section 3 suggests that a successful analysis of BNPs should maintain three characteristics:

- their property status
- their impoverished set of nominal features
- their generalization over particular events

The first two characteristics make BNPs very similar to adjectives. This similarity will be elaborated on in Section 4.1. The eventive nature of BNPs will be the topic of Section 4.2.

### 4.1 Adjectival Nature of BNPs

Some linguists (Jespersen 1968; Kamp 1975; Wierzbicka 1986) have claimed that while adjectives such as *manly* tend to denote a single property in a given usage, such as that of being brave or strong, nouns such as *man* imply several different properties one can notice in the referent of that noun. This intuition was given an

explanation by Wierzbicka (1986) as follows: while an adjective designates a single property, a noun designates a category or a kind that comprises many properties. In (24a) the adjective *blond* is thought of as just a property of having blond hair. The feature of being blond is mentioned as one of many things that can be said about the person—not as something that categorizes the person. If a noun is used instead, as in (24b), it puts a label on the individual. This individual is categorized from the point of view of her appearance. The category associated with the noun *blonde* can be identified by a cluster of properties such as having blond hair, womanhood, and probably some others, such as being sexy, glamorous, etc. Interestingly, the conversion from the adjective *blond* to the noun *a blonde* is accompanied by the emergence of an expressive meaning.

(24) (a) She is blond.

(b) She is a blonde.

What is crucial is that adjectives merely define an abstract class but they do not define a kind. For example, the properties of being blond or manly establish classes of persons that share the respective property, but these properties do not define any kind. All in all, while typical adjectives indicate description, typical nouns designate kinds.

What makes this discussion relevant for our purposes is this: according to Wierzbicka the semantic difference between adjectives and nouns can be traced back to the number feature that is available in nouns and absent from adjectives. Wierzbicka states:

An adjective doesn't delimit<sup>6</sup> its intended referent, whereas nouns typically do. A noun can place the intended referent within a certain imaginable kind, and so it can make delimitation, identification and counting possible. An adjective may restrict the domain to which the intended referent belongs, and to [sic] help to identify this referent within that domain but it can't replace that initial placement within an imaginable domain (i.e., a KIND) (Wierzbicka 1986, 366).

Evidence for the delimitation available in nouns but absent from adjectives comes from the fact that properties contributing to the delimitation of objects are cross-linguistically mostly realized as nouns. Wierzbicka observes that shapes tend to be realized as

6 Wierzbicka gives the following example for illustration: "If we are asked to count everything red in a room we might be in trouble, because we shouldn't know how to delimit one red thing from another. For example, if there is a red tracksuit there, i.e. a pair of red pants and a red top—should one count the tracksuit as one red thing or as two red things?" (Wierzbicka 1986, 366).

nouns (*a circle, a square, and a triangle*), while colors and sizes are adjectives (*red, big*). She sees the reason for this in the fact that shapes delimit certain portions of objects and “make them into countable entities, whereas neither sizes nor colours do that” (Wierzbicka 1986, 367). Additional evidence for this, mentioned by Wierzbicka, comes from the fact that in languages with classifiers, classifiers are very often based on shape rather than on color or size. This suggests that shape is a property which can constitute kinds of things, whereas color and size normally cannot.

I think that the insights about the adjective-noun distinction from the discussion above can help us to account for the difference between INPs and BNPs in German copular sentences. Now we start drawing a parallel between the adjective-noun distinction and the nominal heads of BNPs and INPs. The head of an INP is a regular count noun. It has the inherent nominal features of gender and number. Following Wierzbicka, such a noun should constitute a kind endowed with certain properties. This assumption is in line with de Swart et al. (2007), whose analysis of INPs is adopted here. BNPs are different. The head of BNPs is a deficient noun. It has a gender feature but no number feature. If we imagine a continuum between the nominal categories of noun and adjective, such deficient nouns would be closer to adjectives, since number is not part of the extended functional projection of adjectives, either. Adjectives may be specified for number only via agreement with a noun. Moreover, the deficient nominal heads of BNPs also resemble adjectives semantically. As we have seen above, BNPs have a very restricted meaning. They designate a social role, i.e., a property of being involved in some well-established activities or states. This ability to designate one singular property also places bare nominals closer to adjectives. But it does not mean that they are converted to adjectives (see Berman [2009] for arguments against such a conversion in German). Bare nominals still belong to the category of nouns. Since they lack the number feature, they are deficient nouns. In contrast to adjectives, they are inherently specified for gender. This point is illustrated in (25). The subject *Antonette* and the bare noun in the predicate position *Opfer* “victim” differ in their gender: the subject is feminine and the bare noun is neuter. The attribute *unschuldig* “innocent” gets singular neuter specification via agreement with the bare noun.

- (25) Antonette ist unschuldiges Opfer einer heimtückischen Intrige geworden.  
 Antonette is innocent.N.SG victim.N.SG of an insidious plot become  
 “Antonette is an innocent victim of an insidious plot.”  
 (Googlebooks “Biographien der Selbstmörder” by Christian Heinrich Spiess)

This suggests that the predicate noun bears a gender specification independently of the subject. Thus, in German the gender specification of the predicate noun comes from the noun and not through agreement with the subject. This seems to be different in Romance languages, where, according to Munn and Schmitt (2005) and Zamparelli

(2008), predicative BNPs have no inherent gender but get gender specification via agreement with the subject.

Thus, the parallel between the adjective-noun distinction and the bare vs. indefinite NPs can be drawn only at the semantic level but not at the categorial or part-of-speech level.<sup>7</sup> Bare nominals, while semantically very close to adjectives, are categorically nouns with a specified gender. Their lack of number features explains their “adjective-like” semantics.

The question is now this: why is the meaning of nominals as heads of INPs so flexible in contrast to bare nominals as heads of BNPs? As shown in Section 2, INPs can receive figurative or expressive meaning, while BNPs cannot. This raises the next question about the nature of kinds. Krifka et al. (1995) for instance, building upon the seminal work by Carlson (1980), analyze kinds denoted by definite NPs as proper names for well-established categories. Categories are mentally represented concepts. There has been much debate about the content of concepts. Many theories agree that concepts as mental representations of a category comprise salient properties of kind members (Medin and Aguilar 1999).

The properties characterizing a kind are determined by the shared knowledge of a community of speakers. For example, *actor<sub>k</sub>* as a kind denotation comprises at least properties such as “having an attractive appearance,” “being very creative,” and “having the ability to control their emotions.” The institutionalized activity of playing the roles of characters in films and plays is the most salient property on this list. Nouns of nationalities as heads of INPs as in (26) are similar. Used with an indefinite article, they refer to kinds comprising not only the nationality as the most salient property but also other properties the community associates with the group of people with that nationality, the so-called “stereotypical properties.” Meaning shifts within the concept can take place from the whole property cluster to stereotypical properties. This leads to what I have called above the figurative or expressive meaning. Thus, the NumP *eine Italienerin* in a particular context can refer to the whole cluster of properties the kind comprises or just focus on “stereotypical properties” (see Hallab [2011] for this intuition). This makes it possible to apply the property *eine Italienerin* in (26a) to a German woman who behaves like a typical Italian woman but does not have Italian nationality. The description in (26b) with the BNP, however, may apply

7 It should be noted that some languages (e.g., English, French, and Italian) use adjectives instead of bare nouns in the predication of nationalities and religious denominations, cf. (i) from English:

- (i) (a) David is Jewish. (de Swart et al. 2007, 219)  
 (b) David is a Jew.

Here, the adjective specifies the religion or birth, and thus denotes only one property. De Swart et al. state: “In addition to this neutral interpretation, (51b) [= (ib)] allows a reading that calls up (positive or negative) stereotypes that can be associated with Jews” (de Swart et al. 2007, 219).



Like the parameter  $c$  in dimensional adjectives, the parameter  $e_k$  in social role predicates is contextually specified. However, the relation to the parameter  $c$  in adjectives is essentially different from the relation to the parameter  $e_k$  in bare nominals. I will elaborate more on the nature of the relation to  $e_k$  in the next section. For the sake of completeness, two corresponding examples for INPs are given in (29).

- (29) (a) x ist ein Schauspieler            ein Schauspieler:  $\lambda x$  [REL(x, actor<sub>k</sub>)]  
           x is an actor
- (b) x ist eine Italienerin            eine Italienerin:  $\lambda x$  [REL(x, italian<sub>k</sub>)]  
           x is an Italian.FEM

Unlike in BNPs, the head noun of INPs denotes a kind. The realization operator maps the kind denotation into a set of its instances.

To conclude, the nominal head of BNPs has a different denotation (a social role as a property) than the nominal head of INPs (a kind as an entity). It should be shown in the future how these denotations are related. A possible solution could be a relation within a complex lexical entry along the lines of the qualia theory of Pustejovsky (1995), cf. Geist (in prep.).

## 4.2 Eventive Nature of BNPs

In this section I will further elaborate on the eventive nature of BNPs, which can be made explicit as in (30):

- (30) (a) Udo ist Schauspieler. “Udo is an actor (by profession).”  
           Eventive meaning: Udo can perform the institutionalized activity of professional acting.
- (b) Peter ist Katholik. “Peter is a Catholic (by his religious denomination).”  
           Eventive meaning: Peter professes/practices the Catholic faith.
- (c) Peter ist Engländer. “Peter is an Englishman (by nationality).”  
           Eventive meaning: Peter has English nationality.

To account for the eventive nature of BNPs, previous accounts assumed that BNPs introduce an event variable. This variable is existentially quantified, which suggests that a particular event must take place. We have seen in Section 3.2 that this assumption is problematic. To capture the eventive meaning of BNPs I propose that BNPs are related to event kinds or types rather than to particular event tokens. I take the term event as a cover term for different event types such as activities and states, among

others. Below I will characterize the general notion of event kinds and motivate their participation in the interpretation of BNPs.

Since entering the linguistic stage, the notion of kinds in the nominal domain, originally proposed by Carlson (1980), has been fruitful in the analysis of nominal reference. Later on the notion of kinds was extended to events in the verbal domain. Event kinds have taken on an important role in the analyses of adjectival passives (Gehrke 2011), modification by frequency adjectives (Gehrke and McNally 2011), kind anaphora in the verbal domain (Landman and Morzycki 2003), and weak definites (Schwarz 2014). The hypothesis I will put forth in this paper is that BNPs are associated with an event kind which must be well established, while well-establishedness subsumes cultural establishedness or institutionalization. In the previous section I assumed that the BNP with the head noun *Schauspieler* ‘‘actor’’ and *Italienerin* ‘‘Italian’’ may be represented as a binary predicate that relates an object variable to a contextually specified parameter for event kinds. For example, in the representation  $ACTOR_{role}(e_k, y)$  the role predicate relates the participant  $y$  to the event kind of professional acting. Similarly, in the representation  $ITALIAN_{role}(e_k, y)$  the role predicate relates the participant  $y$  to the contextually specified event kind of having Italian nationality. The question is how to capture the relation to appropriate well-established event kinds formally. I will do that by means of the Well-Established Event Relation  $I$ , which is defined as follows.

(31) Well-Established Event Relation<sup>9</sup>

$I(e_k, x_k)$  if  $e_k$  is a well-established event kind associated with the object kind  $x_k$ .

The predicate  $I$  relates two kind-level individuals: the event kind  $e_k$  and the object kind  $x_k$  with which it is typically associated. The object kind  $x_k$  in this representation can be related to the individual  $x$  via the Carlsonian realization operator REL in (32) that I already introduced in (16a). It maps kinds to their individual instances.

(32) REL:  $\lambda x_k \lambda y [REL(y, x_k)]$

To show how the meaning of BNPs can be formally represented using (31) and (32), let us consider (33a).

(33) (a) Peter ist Arzt. ‘‘Peter is a doctor (by profession).’’

(b) Arzt:  $\lambda x [DOCTOR_{role}(e_k, x) \ \& \ REL(x, doctor_k) \ \& \ I(e_k, doctor_k)]$

9 The Well-Established Event Relation is an adjusted version of the Stereotypical Usage Relation suggested by Aguilar-Guevara (2014) for the treatment of the enriched meaning of weak definites such as in *to be in prison* associated with the stereotypical event kind *to be imprisoned*.

Literally, the formula in (33b) means that the expression *Arzt* names a social role of individuals who are instances of the doctor kind and who are engaged in a well-established kind of event typical of the doctor kind.

Note that in my analysis the social role denoted by the BNP is a binary predicate that links the event kind  $e_k$  to its participant  $x$ ; thus the role predicate can be conceived of as a type of thematic role similar to an agent or experiencer that relates a particular event to its participant. For example, the subject of a sentence with an activity verb such as *to dance* can receive a simplified representation in (34b).

(34) (a) Udo is dancing.

(b)  $\exists e$  [ $_{\text{AGENT}_{\text{theta-role}}}$ (e, Udo) & DANCE(e)]

The thematic role  $_{\text{AGENT}}$  is represented as a binary predicate that relates the event token to its participant, Udo. Social role predicates denoted by BNPs are similar: they relate an event argument of a more general type to the agent. While in sentences like (34) the event is explicitly specified and the theta-role is implicit, in copular sentences, the well-established event kind is implicit, while the role of the subject in this event kind is explicitly named.

A social role can now be understood as a role that a human object as an instance of some object kind has in a well-established activity or state kind typical of its object kind. Sentences with BNPs serve to ascribe to the subject a social role denoted by the bare nominal.

After having represented the analysis of the enriched meaning of BNPs, I will now discuss its advantages. As was shown in Section 3.2, previous event-semantic proposals are problematic for at least two reasons. First, they cannot account for the generic interpretation of BNPs, in particular for the fact that the subject individual need not actually be involved in the activity associated with the BNP. Second, they fail to account for the fact that some event-related modifiers cannot combine with BNPs. My assumption that BNPs are associated with well-established event types rather than with event tokens helps to solve these problems. First, since event types are generalizations about events, they are abstracted away from episodic realizations and denote just a dispositional property of the subject—this is typical of generics in general (Carlson 1995). Second, since BNPs involve event kinds that must be well established, event modifiers are acceptable only if they can be seen as deriving a new well-established event (sub)kind (cf. Gehrke, forthcoming). The restrictions on modification we attested in Section 2 can now be accounted for in the proposed analysis. The different types of adjectives classified with respect to their compatibility with BNPs are represented in Table 2:

| Adjectives  | compatibility with BNPs |
|---|-------------------------|
| <b>eventive I:</b> <i>schnell</i> “fast”          | no                      |
| <b>eventive II:</b> <i>freiwillig</i> “voluntary” | yes                     |
| <b>evaluative:</b> <i>jung</i> “young”            | no                      |
| <b>relational:</b> <i>technisch</i> “technical”   | yes                     |

**Table 2.** Adjectival modifiers in BNPs.

The table shows that only one type of eventive adjectives and relational adjectives can combine with BNPs. Generally, modifiers have to identify their external argument with a referential argument of the modified predicate (Higginbotham 1985). The modification with adjectives listed in Table 2 can succeed if two conditions are met: the target of the modification is an entity,<sup>10</sup> and the argument of the adjective is sortally compatible with its target in the argument structure of the modified expression.

Now I will show how the present analysis captures the restrictions on modification with the different adjective types in Table 2. Modifiers such as *gut* and *schnell* are excluded in BNPs because they do not create well-established event (sub-)kinds in German, while modifiers *freiwillig* in *freiwillig helfen* “to help voluntarily” and *stark* in *stark rauchen* “to smoke heavily,” licensed in BNPs, do. It has been shown by Maienborn (2007), among others, that modifiers of the type that we call event kind modifiers must more generally be deeply embedded into the structure of the modified expression. Gehrke (2011; forthcoming) suggests that kind-level modifiers in adjectival passive constructions are incorporated into the modified participle and thus they are similar to adjectives in A+N compounds. The integration of such adjectives must occur at the level of word formation, i.e., before the event kind is established.

The next type of adjectives, evaluative adjectives such as *jung* “young,” is excluded. My explanation for this fact is that they apply to object-level entities. Since BNPs denote properties rather than object-level entities, such adjectives cannot combine with BNPs.

Adjectives of the last class, such as *technisch* “technical,” can felicitously modify BNPs. According to McNally and Boleda (2004), such adjectives operate at the level of object kinds. As in the case of type 2 event kind modification above, the well-establishedness condition also applies to this case. This explains why *technischer Direktor* “technical director” and *persönlicher Assistent* “personal assistant” are acceptable without an article while *neuer Direktor* “new director” is not. Adjectives like *neu* in combination with *Direktor* do not restrict the kind described by the noun to a well-established subkind but rather provide an additional description of an individual. The

<sup>10</sup> I distinguish adjectives such as those listed in Table 2 as entity modifiers from adjectives such as *former* as predicate modifiers (cf., e.g., McNally and Boleda 2004 on this difference).

description *neuer Direktor* is not sufficiently well established to become a name of a subkind. McNally and Boleda (2004) suggest for adjectives like *technical* the representation in (35).

(35) *technisch*:  $\lambda x_k$  [TECHNICAL( $x_k$ )] (McNally and Boleda 2004, 188)

According to this representation, *technisch* denotes a property of object kinds and not of particular individuals. In my formal analysis of the enriched meaning of BNPs such as that in (33b), however, the argument for object kinds is no longer available as a target for modification since it is already saturated by the name of the kind. But then how are kind-level modifiers integrated into the structure? As in the case of event type modifiers described above, object type modifiers should apply to the modified expression at the level of word formation before the establishment of the kind is finished. At this level the variable of the modified noun ranging over kinds is open and can serve as a target for kind modification.

To sum up, the assumption that BNPs are associated with event kinds that serve as well established for a particular object kind helps to account for their genericity and for the restrictions on their modification.

## 5. Conclusions

We can explain the peculiar properties of BNPs in predicate positions if we assume that they denote social roles analyzed as predicates that relate well-established event kinds to their participants. Since BNPs are semantically properties right from the beginning, they satisfy the requirements of the copula for a predicative position without any shifts. Syntactically, they are impoverished since they are not specified for number and thus lack the NumP layer. Restrictions on adjectival modification follow straightforwardly from this analysis: since BNPs, similarly to adjectives, denote properties, entity-oriented modifiers are not compatible with them. Kind-related modification that targets event kinds and object kinds involved in the meaning of BNPs can take place. Putting all the pieces of a copular sentence together, the subject is assigned a social role denoted by the BNP, which qualifies the subject to be engaged in a type of well-established activity or state typical of the kinds of individuals the subject belongs to.

There are interesting parallels between bare predicate NPs and other constructions with bare nominals, such as the bare location constructions *auf See* “on the sea” or *zu Hause* “at home” (cf. Kiss [2010] for German and Stvan [2009] for English) and object pseudo-incorporation, such as *Klavier spielen*, literally “to play piano.” The singular count nouns in such constructions exhibit features similar to the bare predicates analyzed in this paper, such as their relation to well-established activities, number neutrality, and restricted modification. However, because of space limitations I have to leave a comparison to such constructions for another occasion, cf. Geist (in prep.).

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# Romanian Adnominal Locative PPs and Argument Structure

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**Abstract:** I discuss the distribution of *de* with adnominal PPs in Romanian. I argue that *de* is obligatory with locative modifiers attached to nominal projections, with a single exception: inside postcopular indefinites. In the other cases in which *de* is absent, the PP is either argumental or attached to a verbal projection (embedded under a nominalizer or DP-external). In particular, I argue that *de*-less PPs that localize an indefinite object of possession-related verbs are attached to a low projection in the multi-layered argument structure of these verbs, which supports event decomposition in syntax. I analyze *de* as a relativizer that binds the world variable of the locative predication. From the obligatory use of *de*, I conclude that locatives cannot combine with nouns by direct modification.

**Keywords:** adnominal locatives; locative prepositions; argument structure; possession verbs.

## 1. Introduction: *de* with Adnominal Locative PPs

Adnominal locative prepositional phrases in Romanian must be preceded by the functional preposition *de* (roughly equivalent to “of”), except in certain environments to be defined below. This requirement holds both for spatial and temporal location (see [1a–b]). Locative pro-adverbials behave like locative PPs with respect to the use of *de* (see [1c–d]).<sup>1</sup>

1 *De + în* “in” is obligatorily contracted into *din* (see [1b]).

- (1) (a) Cartea \*(de) pe masă e veche.  
 book-the of on table is old  
 “The book on the table is old.”
- (b) Faimoasa erupție din / \*în 79 a fost precedată de multe  
 famous-the eruption of-in in 79 has been preceded by many  
 altele.  
 others  
 “The famous eruption in 79 was preceded by numerous others.”
- (c) cărțile de acolo  
 books-the of there
- (d) filmul de ieri  
 movie-the of yesterday

In this paper, after presenting the conditions in which *de* does not occur, I will propose an explanation of the distribution of *de*, arguing that when *de* is absent, the locative is either inside a verbal projection embedded under a nominalizer or outside the DP. The cases of DP-external placement are particularly interesting because they lead to a number of conclusions about clause structure in general, supporting a multi-layered syntactic projection of verbal argument structure and the existence of a special position for the restriction of clause-level quantifiers. I will then propose an analysis of adnominal *de*, arguing that its role is to bind the situation variable of the locative predication.

### 1.1 Adnominal *de* vs. Ablative *de*

Before pursuing our investigation of the adnominal *de*, it should be noticed that there is a different *de* + PP/Adverbial-construction, which expresses Source (the initial state of a change-of-place event, and other arguments or adjuncts treated as starting points—e.g., source of information, temporal starting point of an event). Romanian does not have a simple preposition “from”; the ablative requires decomposition into Path + Location:

- (2) (a) Au venit de pe munte / de la școală / din  
 have.3PL come from on mountain from at school from-in  
 Italia / de acolo.  
 Italy from there
- (b) Am aflat-o de la el.  
 have.1SG learned-it from at him  
 “I learned it from him.”

- (c) Sunt aici de la ora 5.  
am here from at hour-the 5  
“I’ve been here since 5 o’clock.”

It is likely that adnominal *de* originated in this ablative *de*. Note indeed that ablative PPs, in languages in which they are distinct from adnominal locatives (e.g., English), can occur as nominal modifiers, in order to convey the fact that the spatial relation holds at times previous to the time of the matrix:

- (3) the plants {from / in} your garden

Romanian differs from English in that the mere use of the locative preposition “in” in (3) is not possible, so that the contrast in (3) cannot be expressed in Romanian (both “from” and “in” are rendered as *din* = *de* + “in”).

## 1.2 Situations in Which Adnominal *de* Is Not Used. Towards a First Generalization

The research on Romanian nominalizations (Cornilescu 2001; Cornilescu et al. 2013) has established two situations in which *de* does not occur with adnominal locatives:

- (i) With locative modifiers inside complex event nominalizations in the sense of Grimshaw (1990)—examples (4) show typical complex event nominalizations, the “long infinitive” and the nominal supine; they contrast with the examples in (5), with simple event nouns, in which *de* is required:

- (4) (a) Interpretarea operei Aida la Covent Garden a  
performance-the opera-the.GEN Aida at Covent Garden has  
fost memorabilă.  
been memorable

“The performance of the opera *Aida* at Covent Garden was memorable.”

- (b) Cântatul lui în baie mă enervează.  
singing-the his in bathroom me annoys  
“His singing in the bathroom annoys me.”

- (5) (a) Interpretarea \*(de) la Paris a actorului a dezamăgit.  
performance-the of at Paris GEN actor-the.GEN has disappointed  
“The actor’s performance in Paris was disappointing.”

- (b) Ai                                    auzit   declarația        din / \*în   parlament   a  
 have.2SG                                heard   declaration-the   of-in   in   parliament   GEN  
 prim-ministrului?  
 prime-minister-the.GEN  
 “Did you hear the prime minister’s statement in the parliament?”

(ii) With locative arguments (complements), including arguments of simple event nominals<sup>2</sup> and non-eventive nominals:

- (6) (a) Vizita   la   Luvru   a   durat   toată   ziua.  
 visit-the at/to Louvre has lasted whole day-the

- (b) distanța        între        cele    două    puncte  
 distance-the    between    the    two    points

To these data known from the literature, I add some further data which can be subsumed under (ii): even with nouns which are not relational, *de* is absent with locatives that have a quasi-argumental interpretation, specifying one of the arguments of a relation implied by the lexical-conceptual structure of the noun. This may explain the contrast between (7a, c) and (7b, d):

- (7) (a) podurile        peste    Dunăre  
 bridges-the        above    Danube

- (b) norii            \*(de)   peste    vale  
 clouds-the        of        above    valley

- (c) calea        ferată    între    București    și    Ploiești  
 road-the        rail        between    Bucharest    and    Ploiești

2 *Vizită* in (6a) is not a complex event noun, as shown by the fact that the object of the visit (the museum) does not surface as a genitive and also by the fact that locative modifiers take *de*—see (i), which has a temporal location modifier introduced by *de*:

- (i) vizita        la        muzeu        de    sâmbăta        trecută  
 visit-the    at/to    museum    of    Saturday-the    last

The complex event noun corresponding to *vizita* “to visit” is *vizitare*, which takes a genitive object and, correlatively, a *de*-less locative modifier:

- (ii) vizitarea        muzeului        sâmbăta        trecută  
 visiting-the        museum-the.GEN    Saturday-the    last

- (d) casa            {dintre /        \*între}    copaci  
 house-the    of-between /    between    trees  
 “the house between the trees”

*La* “to, at” lacks *de* when it does not express location, but rather purpose or orientation:

- (8) (a) cheia      la    ușa            aceasta  
 key-the    to    door-the    this  
 “the key to this door”

- (b) camerele    la    stradă  
 rooms-the    to    street  
 “the rooms to the street”

Assuming that complex event nominalizations involve verbal projections (v, maybe Asp) embedded under a nominalizer head (see Borer 1994; Fu et al. 2001; Alexiadou 2001; Cornilescu 2001; Alexiadou et al. 2007), the first situation of absence of *de* (see [4]) can be explained by the fact that the locative modifies a *verbal*, rather than a nominal projection. As for (ii), the data in (6) and (7) show that *de* is only present with *bona fide* modifiers, excluding arguments as well as quasi-argumental PPs. We come thus to the following generalization:

- (9) A locative *modifier* inside a *nominal* projection must be marked by *de*.

## 2. Further Situations in Which *de* Does Not Appear

Recent studies (Giurgea and Mardale 2013; Mardale 2013) have pointed out some data which appear to be exceptions to (9) and concluded that there is a connection between the presence of *de* and specificity:

- (i) *de* does not appear with non-specific objects of intensional verbs (see [10] vs. [11]) and of verbs related to possession (see [12]):

- (10) Ion dorește / vrea / caută      o casă    la munte  
 Ion desires    wants    looks-for    a house    at mountain  
 “Ion wants/is looking for a house (that should be) in the mountains.”

- (11) Ion dorește/ vrea    o casă    de la munte  
 Ion desires    wants    a house    of    at mountain  
 “Ion wants a certain house, which is in the mountains.”

(12) (a) Ion a cumpărat/ are o casă la București.  
 Ion has bought/ has a house at Bucharest

(b) Ion are adresa la București  
 Ion has address-the at Bucharest

(ii) *de* can be absent with generic DPs:

(13) (a) Casele la București sunt scumpe.  
 houses-the at Bucharest are expensive  
 “Houses in Bucharest are expensive.”

(b) Un apartament la București costă mai mult decât o casă la Slobozia.  
 an apartment at Bucharest costs more much than a house at Slobozia  
 “An apartment in Bucharest costs more than a house in Slobozia.”

(iii) *de* can be absent inside indefinites in predicative position:

(14) Limoges e un oraș în Franța  
 Limoges is a city in France

In this article, I will argue that (i) and (ii) (examples [10], [12], and [13] above) do not constitute exceptions to the generalization in (9), because the locative PPs are in fact external to the DP. The only true exception remains (iii), an issue which I will address in the end of the paper, after I develop an account of the construction with *de* which explains the specificity effect found in (11).

### 3. Locatives in Possessive Predications

In this section, I will argue that the locatives without *de* in (10)–(12) above (point [i] in Section 2) are in fact external to the DP. After presenting the evidence for their DP-external placement (Section 3.1), I will make a hypothesis about the position that these locatives occupy in the clause. Before pursuing the discussion, it is important to notice that the verbs in the examples (10)–(12) can all be considered verbs related to possession: (“want something” is “want to *have* something,” “look for *x*” in [10] is “try to *get* *x*.” The object of the verbs in (10) (“want,” “look for”) is interpreted as possessed by the subject in the situation that constitutes the goal of the action.

#### 3.1 Arguments for the DP-External Placement of the *de*-less Locative

Extraction facts show that *de*-less locatives in (10) and (12) are DP-external. Thus, they can undergo *wh*-movement (see [15a], [16a]), scrambling in the postverbal field (see

[17a]), topicalization (see [18a]), whereas adnominal *de*-PPs (which are of course DP-internal, as shown by the presence of *de*) as well as other adnominal adjunct PPs can undergo none of these movement operations (see [15b–d], [16b–c], [17b–c], [18b–c]):

- (15) (a) Unde îți dorești o casă?  
 where you.DAT wish.2SG a house  
 “Where do you want (to have) a house?”
- (b) \*[De unde]<sub>i</sub> îți dorești [o casă t<sub>i</sub>]?  
 of where you.DAT wish.2SG a house  
 Intended meaning: “Where is the specific house you wish?”
- (c) \*[Cu ce]<sub>i</sub> îți dorești [o casă t<sub>i</sub>]?  
 with what you.DAT wish.2SG a house
- (d) Am invitat [prieteni din facultate] / \*[De unde]<sub>i</sub> ai invitat  
 have.1 invited friends of-in faculty of where have.2SG invited  
 [prieteni t<sub>i</sub>]?  
 friends  
 “I invited friends from the faculty.” / (Intended meaning) “Wherefrom were the friends you invited?”
- (16) (a) Unde are o casă?  
 where has a house
- (b) \*[De unde]<sub>i</sub> a desenat [o casă t<sub>i</sub>]?  
 of where has drawn a house
- (c) \*[De cine]<sub>i</sub> a recitat [o poezie t<sub>i</sub>]?  
 by whom has recited a poem
- (17) (a) Am cumpărat la București o casă  
 have.1 bought at Bucharest a house  
 Possible interpretation: “I bought a house situated in Bucharest.”
- (b) \*Am cumpărat [de la București]<sub>i</sub> [o casă t<sub>i</sub>]  
 have.1 bought of at Bucharest a house
- (c) \*Am cumpărat [cu turn]<sub>i</sub> [o casă t<sub>i</sub>]  
 have.1 bought with tower a house

- (18) (a) La București, Ion are / a cumpărat o casă  
 at Bucharest Ion has / has bought a house  
 Possible interpretation: “Ion has/bought a house situated in Bucharest.”

(b) \*[De la București]<sub>i</sub>, Ion are / a cumpărat [o casă t<sub>i</sub>]  
 of at Bucharest Ion has / has bought a house

(c) \*[Cu turn]<sub>i</sub>, Ion are / a cumpărat [o casă t<sub>i</sub>]  
 with tower Ion has / has bought a house

I conclude that displacement facts clearly show that *de*-less locatives with possessed objects are not DP-internal. We have thus a straightforward explanation for the absence of *de* in these cases: the PP is not adnominal.

Note however that displacement of the whole [Object + Locative] constituent is also possible:

- (19) [O casă la MUNTE] mi-aș dori / a cumpărat.  
 a house at mountain me.DAT-would.1SG wish / has bought  
 “It is a house in the mountains that I wish / that (s)he bought.”

An explanation of this fact will be provided by the syntactic analysis that will be developed in the following sub-section: I will argue that the locative forms a small clause with the possessum. It is this small clause that is raised in (19).

### 3.2 Syntactic Analysis

If the locative in (10)–(12) is DP-external, which position does it occupy? Notice that examples such as (20), both in Romanian and in English, are ambiguous: *in Paris* (Ro. *la Paris*) can locate either the buying event, or the possessum (the house):

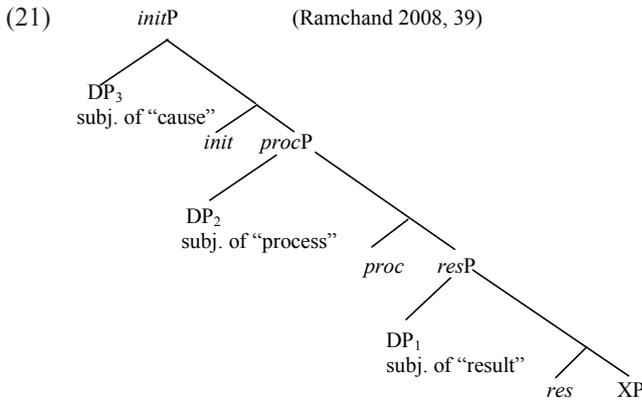
- (20) Ion a cumpărat o casă la Paris.  
 Ion has bought a house at Paris  
 “Ion bought a house in Paris.”

Precisely because in the second reading, the locative only modifies the possessum, it has been considered adnominal by the studies reviewed in Section 2. But the evidence in 3.1 has shown that it cannot be adnominal.

The solution I propose relies on event decomposition in syntax. Verbs expressing changes can be semantically decomposed into sub-events (see Jackendoff 1976; Rappaport-Hovav and Levin 1998; a. o.). A number of authors have proposed that the

internal structure of complex events is reflected in the syntactic structure (see Hale and Keyser 1993; Ritter and Rosen 1998; Travis 2000; Ramchand 2008; a. o.). What is relevant for our purposes is the distinction between a phrase expressing the process and a phrase expressing the result. The idea is that the ambiguity in (20) is due to the existence of two possible attachment positions for the locative, to the phrase denoting the buying process and to the phrase denoting the result.

For concreteness, I will adopt Ramchand's (2008) framework, one of the most elaborated theories of argument structure that uses event decomposition in syntax. According to this theory, verbs can project all or a part of the structure in (21) (where *initP* = Initiator Phrase, *procP* = Process Phrase, *resP* = Result Phrase):<sup>3</sup>



With the verb *buy*, the result state is a state of possession (the Agent is the possessor of the Theme). I propose that the interpretation of the locative in (20) in which it locates only the Theme is characteristic of structures expressing possession. Note indeed that this is the only interpretation of the locative in the basic possessive clause:

- (22) Ion are o casă în Spania.  
Ion has a house in Spain

The locative in (22) does not localize both of the participants to the possession relation, but only the possessum.

<sup>3</sup> ProcP is the dynamic part of the event. ResP is a state. The projection of ResP is characteristic of achievements. InitP corresponds to the projection that introduces the external argument (Kratzer's [1996] VoiceP, Chomsky's [1995] v\*P).

The two readings of the locative in (20) are thus associated to the two different structures given below (in (23a) we have location of the buying event, where the locative modifies ProcP;<sup>4</sup> in (23b), where the locative is inside ResP, it locates the Theme):

(23) (a) [<sub>InitP</sub> John<sub>i</sub> bought [<sub>ProcP</sub> [<sub>ResP/PP</sub> x<sub>i</sub> HAVE a house] in Bucharest]]

(b) [<sub>InitP</sub> John<sub>i</sub> bought [<sub>ProcP</sub> [<sub>ResP/PP</sub> x<sub>i</sub> HAVE a house in Bucharest]]]

The co-indexation between the agent of *buy* and the possessor (the subject of the result state) is a lexical property of the verb (Ramchand's system allows an argument to fulfill multiple roles, occupying multiple positions in the argument structure; this possibility is encoded in the verb's lexical entry):<sup>5</sup>

(24) [<sub>InitP</sub> Agent<sub>i</sub> [*buy* [<sub>ProcP</sub> (*buy*) [<sub>ResP</sub> x<sub>i</sub> HAVE Theme]]]]

As for the [Possessor [Relator Possessee]] structure for possessive small clauses, with the possessor higher than the possessee, Ramchand assumes it for the double object construction, following Pesetsky (1995) and Harley (2002).<sup>6</sup>

This analysis allows us to explain the generalization that locatives of the type in (10)–(12) are characteristic of verbs related to possession. The proposal is that all these verbs project a possessive small clause in their argument structure.

There are two issues that should be clarified: the way in which the locative combines with the possessive small clause and the way in which the possessive small clause appears in the syntactic structure projected by other verbs related to possession (*offer*, *want*, *find*, etc.).

On the first issue, I propose that the possessive relator, which I notate as HAVE, allows an optional predicative layer which localizes the possessum:<sup>7</sup>

4 We can also assume that the locative modifies InitP in this reading.

5 In Ramchand's system, the lexical verb subsequently merges in all the positions of the argument structure, by virtue of its *res*, *proc* and/or *init* categorial features. This implies that instead of HAVE in (24), we must assume incorporation of the possessive relator into the verb *buy*. I keep the notation HAVE in this paper in order to highlight the place in which the possessive small clause is inserted in the verb's argument structure.

6 Ramchand assumes that role identification is possible only between specifiers; therefore, only the construction with a specifier possessor can be used in the implementation of my analysis.

7 I will not elaborate here on the nature of the possessive relator. *Have* has been analyzed as a copula that incorporates a locative preposition (whose complement is promoted as the subject)—*be-at*, see Benveniste (1966), Freeze (1992), den Dikken (1995). Other authors agreed that *have* is a copula incorporating a preposition, but identified the preposition as *with* (see Kayne [1993], Harley [2002], Levinson [2011]). In any case, in (25) we have a different element that localizes the possessee. This shows that possession and localization should be kept distinct.

(25) [Possessor [HAVE [<sub>PredP</sub> Theme [Pred Location]]]]

There are two reasons for this proposal: first, the fact that the locative only locates the Theme is characteristic to possessive constructions and would not follow if the locative were attached as an adjunct to the whole possessive small clause. Second, there is another construction in which *have* takes a further predicative layer: this is one of the s(tage)-level uses of *have*, where it takes, besides the possessum and the possessor, a predicate applied to the possessum:

(26) (a) Am cartea la tine.  
 have.1SG book-the at you  
 “My book is with you / at your place.”

(b) Le am pregătite de la ora 5.  
 them(FPL) have.1SG prepared.FPL from at hour-the 5  
 “I’ve had them prepared since 5 o’clock.”

Notice that the special theme-locating reading of locatives discussed here only appears with indefinite objects (except with the verb *have* in the construction in (26a) and (12b)—contrary to (20), the locative in (27) can only locate the buying event, not the house:

(27) Ion a cumpărat casa la Paris.  
 Ion has bought house-the at Paris  
 “Ion bought the house in Paris.”

I conclude that the predicative layer in (25) involves an *existential* HAVE-construction. The existence of such a construction is supported by the fact that i(ndividual)-level *have* puts the same constraints on its object as the existential *there is*. This is illustrated in (28): definite objects are fine only with elements that induce an s-level reading—e.g., adverbials that introduces a temporal boundary of the possession state, past tense

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Regarding the semantics of the structure in (25), note that the lower predicative layer must transfer up the denotation of the possessed entity (the Theme is an argument of both HAVE and the spatial relation). This can be achieved by assigning a special denotation to the lower Pred, which makes PredP a function that is applied to the higher relation, HAVE, as proposed by Pyllkänen (2008) for her low Appl (P represents the denotation of the locative PP, a property obtained from the P-relation by saturating its inner argument; f stands for the relation denoted by the higher head, HAVE, and x for the Theme; I notate the event type as *ev* here, because I am not sure that type *s* is appropriate for events, which might be considered as a sub-type of entities, as shown by eventive nominalizations):

(i) [[Pred]] =  $\lambda P \lambda x \lambda f_{\langle e, \langle e, \langle ev, t \rangle \rangle} \lambda z \lambda e [ f(e, z, x) \wedge P(e, x) ]$

(see [28a–b]), a further s-level predicate (see [26] above)—or in contexts that allow an s-level possession interpretation (see the readings of [28c]):

- (28) (a) Am casa asta ??(din 1989).  
 have.1SG house-the this since 1989  
 “?? I have this house / I’ve had this house since 1989.”
- (b) Am avut și eu mașina asta.  
 have.I had also I car-the this  
 “I’ve also had this car.”
- (c) Am mașina asta.  
 have.1SG car-the this  
 “I have this car.”  
 ≠ “I possess this car.”  
 = This is the car I’m using now

If *have* is a “possessive copula” (a copula incorporating a possessive relator/preposition, see the discussion in fn. 7), the existential possessive construction can be seen as the counterpart of the *be*-existential construction. Notice that *there-is* existentials also allow a locative layer:

- (29) (a) There is a house (on the hill).  
 (b) I have a house (on the hill).

The second task is to show how the possessive layer is projected with the various verbs related to possession which we have shown to allow PPs that locate the possessum. The general idea is that the structure in (25) is embedded, with these verbs, as the lowest level of their argument-structure, as we have already seen with *buy*:

- (30) [<sub>InitP</sub> Agent<sub>i</sub> [*buy* [<sub>ProcP</sub> (*buy*) [<sub>Resp</sub> x<sub>i</sub> HAVE Theme]]]]

With *buy*, I assume that the identity between the Agent and the possessor is a lexical requirement of the verb; when a different intended possessor appears, expressed by a dative, as in (31a), there is a further ApplP that introduces a benefactor which can be understood as the possessor of a subsequent situation (not the one which is the immediate result of *buy*); the benefactor / future intended possessor can also be expressed by a *for*-PP adjunct (see [31b]):

- (31) (a) I-am                      cumpărat    fiului            meu    o    casă    la    mare.  
 him.CL.DAT-have.1    bought    son-the.DAT    my    a    house    at    sea  
 “I bought my son a house at the seaside.”
- (b) Am            cumpărat    o    casă    la    mare    pentru    fiul            meu.  
 have.1    bought    a    house    at    sea    for    son-the    my  
 “I bought a house at the seaside for my son.”

There are however verbs with which the possessor is not identified with the agent; such verbs also allow a locative inside the ResP:

- (32) I-am                      oferit    lui    Ion    o    casă    la    mare.  
 3SG.CL.DAT-have.1    offered    DAT    Ion    a    house    at    sea  
 “I offered Ion a house at the seaside.”

A further difference between *buy* and *offer* is that with *offer* the result state is not actual possession, but modalized possession—the Goal acquires the possibility to become possessor of the Theme. With this proviso, we can represent *offer* as

- (33) [<sub>InitP</sub> Agent [*offer* [<sub>ProcP</sub> Goal<sub>i</sub> (*offer*) [<sub>ResP</sub> x<sub>i</sub> [HAVE Theme]]]]]

With *want*-type verbs (see [10]), the possession predication cannot occur as a ResP because such verbs are stative (stative verbs lack the Proc and Res layers). But a predicational structure in the complement of *want* is likely in view of the fact that *want* normally takes clausal complements. *Want* semantically selects propositions; event nouns can be shifted to a proposition interpretation (set of possible worlds in which the event takes place)—thus, (34b) is equivalent to (34a):

- (34) (a) I want them to marry.  
 (b) I want their marriage.

With object-denoting nouns, the proposition is obtained by adding a hidden possessive predicate:

- (35) I want the house. = I want to have (possess) the house.

As it is highly unlikely that this hidden relation comes from the noun, we must conclude that it is the lexical entry of the verb which introduces it. The possibility of having a locative referring to the desired state, as in (10), supports the idea that the possessive

small clause is projected in syntax. Labeling the possessive relator that heads the small clause P, we can represent “possessive“ *want* as follows:

(36) [<sub>initP</sub> Experiencer<sub>i</sub> [*want* [<sub>pp</sub> x<sub>i</sub> [HAVE Theme]]]]

The possessive relator can also be overtly expressed by a preposition—the preposition *cu* “with”—if the verb is the light verb *face* “do/make”:

(37) Am      făcut-o                      pe Maria cu      o casă      la mare.  
 have.1 made-CL.3SF.ACC      OBJ Maria with a house at sea  
 “I made Maria have a house at the seaside.”

The cases in which the possessive relator is covert and selected by the verb (all the examples we have seen until [37]) can be represented as *incorporation* of P into the V (see Hale and Keyser 1993).

#### 4. Small Clauses in the Restriction of GEN

The second purported exception to the obligatory use of *de* with locative modifiers inside nominal projections concerns generic DPs—see (13) in Section 2; (13a) is repeated below:

(38) Casele      la București sunt scumpe.  
 houses-the at Bucharest are expensive

Here too the locative can be analyzed as DP-external. I propose that the locative is a small-clause whose subject is coindexed with the subject of the sentence and which is attached in a position which is interpreted as the restriction of the GEN operator:

(39) [ casele<sub>i</sub> [ [ x<sub>i</sub> la București ] [GEN [sunt t<sub>i</sub> scumpe]]]] =  
 [ casele λx [ [ x la București ] [ GEN [sunt x scumpe]]]]  
 “for any x ∈ [[the houses]], if x is in Bucharest, then, in general, x is expensive”

This analysis is supported by the fact that the subject can be a proper name, which does not allow DP-internal postnominal modification (in [40], we have generic quantification over situations containing Maria, restricted to those placed at the seaside):

(40) Maria la mare este o cu totul altă      persoană.  
 Maria at sea is a wholly different person

As to the precise position in which the small clause occurs, overt adverbs of quantification show that it needs not be adjacent to the adverb:

- (41) Casele pe deal sunt în general însorite.  
 houses-the on hill are generally sunny  
 “Houses on a hill are generally sunny.”

I propose therefore that the small clause occurs in a domain of the clause dedicated to the restriction of clausal quantifiers, which is preverbal and can be treated as topic. Its direct association with the adverb of quantification obtains at LF.

## 5. Specificity Effects and the Status of *de*

The data in Section 2, especially the contrast between (10) and (11), suggested that adnominal *de* is somehow connected to specificity. How can we explain this contrast given our DP-external analysis of *de*-less locatives with objects of possession-related verbs?

If locative predications as in (10) are characteristic of *existential* possessive constructions, as argued in Section 3, the non-specificity effect is expected. What still remains unexplained is the specificity effect triggered by the use of *de* in (11), repeated below:

- (42) Ion dorește / vrea o casă de la munte  
 Ion desires wants a house of at mountain  
 “Ion wants a certain house, which is in the mountains.”

The specificity effect in (42) cannot be simply due to the adnominal position of the PP. We get the non-specific reading with adnominal constituents expressing location if they are realized as relative clauses with the subjunctive mood:

- (43) Ion vrea o casă care să fie la munte  
 Ion wants a house which SBJV be.SBJV.3 at mountain

I propose that the specificity effect comes from the fact that DP-internal locative predications have an independent evaluation index—they are evaluated at the real world, which implies that the entity located by the PP must exist in the real world (whereas we get the non-specific reading when the locative predication is evaluated at the worlds of the subject’s desires). This interpretive property can be considered as the semantic contribution of *de*.<sup>8</sup> In other words, *de*-phrases are equivalent to indicative relatives. Indeed, (42) has the same interpretation as (44):

<sup>8</sup> Treating the world of evaluation as an argument of the predicate, we can say that *de* saturates this argument slot by a free variable interpreted deictically—as the real world by default.

- (44) Ion vrea o casă care este la munte  
 Ion wants a house which is(IND) at mountain

This interpretative effect distinguishes *de*-locatives from other adnominal intersective modifiers—PPs as well as adjectives:

- (45) Ion vrea o casă cu turn. ≠ Ion vrea o casă care **este** cu turn.  
 Ion wants a house with tower Ion wants a house which is(IND) with tower  
 “Ion wants a house with a tower.” “Ion wants a house which has a tower.”
- (46) Ion vrea o casă mare. ≠ Ion vrea o casă care **este** mare.  
 Ion wants a house big Ion wants a house which is(IND) big  
 “Ion wants a big house.” “Ion wants a house which is big.”

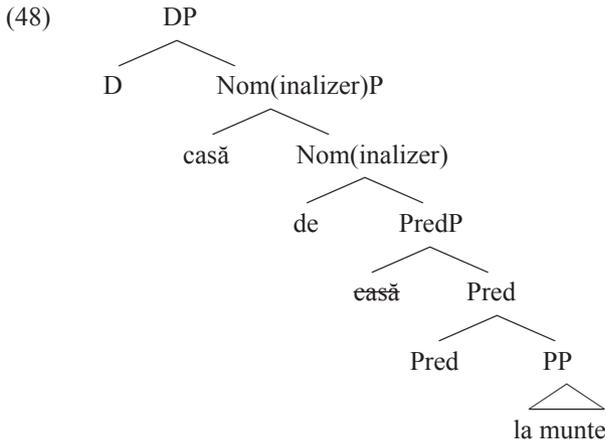
How can this difference be explained? I propose that it comes from the fact that *de*-locatives are reduced relatives, whereas the modifiers in (45)–(46) are *direct modifiers*. The idea is that an independent evaluation world can be introduced by a relative clause construction, but not by direct modification, because it requires a clausal structure. Direct modification relies on Heim and Kratzer’s (1998) predicate modification rule.<sup>9</sup> Extending this rule to world variables, I propose that the world argument of the modifier is identified with the world argument of the NP sister (on a par with the individual argument):

- (47) If A is  $\langle e, \langle s, t \rangle \rangle$  and B is  $\langle e, \langle s, t \rangle \rangle$ , then  $[[A B]] = \lambda x \lambda w ([A](x)(w) \wedge [B](x)(w))$

I conclude that *de* is a relativizer specialized for locative small clauses. For concreteness, I will adopt a raising analysis of reduced relatives, which has the advantage that *de*, the head which binds the world variable, c-commands the base position of the head noun. I adopt a two-layered analysis of raising relatives, as in Bianchi (1999), and consider the higher head as a nominalizer, as proposed by Bhatt (2002). As for the lower head, in order to distinguish reduced relatives from full relatives, I propose the label Pred:

<sup>9</sup> This rule applies when the constituents combined have the same denotation, of the property type  $\langle e, t \rangle$ ; the result is a property that holds of entities which have both properties denoted by the two sub-constituents:

(i)  $[[A B]] = \lambda x ([A](x) \wedge [B](x))$



From the necessary use of *de* with adnominal locative modifiers (the generalization in [9], defended here), I conclude that locative PPs differ from other property denoting expressions (such as adjectives and *with*-PPs) by not being able to combine with the NP by Heim and Kratzer’s (1998) Predicate Modification, as direct modifiers. This indicates that they have a richer argument structure—they can take an event as a radically external argument (by “radically external” I mean not generated in an argument position), but not an individual (as opposed to intersective direct modifiers, which do have a radically external argument, if we assume Predicate Modification).

## 6. On the Absence of *de* in Predicative Indefinites

From the three possible exceptions to the generalization in (9) presented in Section 2, there is one which is not amenable to a DP-external analysis: *de*-less locatives inside postcopular indefinites:

- (49) Limoges e un oraș în Franța.  
 Limoges is a city in France.

Example (50) shows that the construction is limited to indefinites:

- (50) Limoges e orașul \*în / din Franța cu cei mai mulți șomeri.  
 Limoges is city-the in / of-in France with the more many unemployed  
 “Limoges is the city in France with the highest unemployment rate.”

Extraction facts show that the locative is DP-internal (unlike those in Section 3):

- (51) (a) \*Unde e Limoges un oraș?  
           where is Limoges a city
- (b) \*Limoges e în Franța un oraș.  
           Limoges is in France a city

The restriction of this construction to indefinites and predicate positions suggest that the functional structure of the DP is involved. Maybe the indefinite article here is not a D (as proposed for predicative indefinites by various researches, see Roy (2013) and references therein) and the binding of the world variable is only possible inside DPs. Therefore, a null variant of the relativizer in (48) is selected, which leaves the world variable unbound. Under this hypothesis, the use of *de* inside indefinite predicates, which is possible, see (52), would correlate with a DP-status of the postcopular indefinite:

- (52) Limoges e un oraș din Franța.  
       Limoges is a city of-in France.

I leave a precise analysis of this phenomenon for further research.

## 7. Conclusions

The Romanian data concerning the use of *de* with adnominal locatives provides evidence for: (i) event decomposition in syntax for possession verbs and desiderative verbs related to possession (supporting a multilayered argument structure, such as in Ramchand [2008]); (ii) the existence of a special small clause position for the restriction of adverbial quantifiers, including the null quantifier GEN; (iii) the existence of a verbal projection or at least of a verb-type denotation inside complex event nominals.

Conclusions that hold for Romanian in particular are: (i) Locatives require a predicative (small clause) projection in order to take an individual external argument. They can be direct modifiers only of event-denoting projections. (ii) Adnominal *de* with locatives introduces a reduced relative and binds its world/situation variable. Whether (i) holds for other languages is an issue which deserves to be further researched.

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# A Split-DP Hypothesis for Latin and Italo-Romance

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**Abstract:** The rich morphology, lack of articles, free word order, discontinuous noun phrases, and generalized null anaphora of Latin are often taken as evidence of either non-configurationality or discourse configurationality. In this approach, the main innovation in Romance languages would be the development of a syntax-configurational structure. The aim of this paper is to provide a formal analysis to show that the possible word orders in Latin are not just dependent on pragmatics but are strictly controlled by syntax. We propose that Latin is as configurational as Romance languages, claiming that they have the same hierarchy of inflectional features, of adjectival modification, and of discourse features, and display the same syntactic procedures to combine lexical and functional elements. From this perspective, the diachronic change from Latin into old and modern Romance languages (here represented by old and modern Italian) is to be derived by a single parameter that regards the different bundling of the features in D, namely Case and Reference, with the other features of N, namely Gender and Number.

**Keywords:** (non-)configurationality; DP structure; word order; nominal Left Periphery; discontinuity.

## 1. Introduction

This paper focuses on the linguistic change in the nominal domain from Latin to Romance languages, focusing particularly on Italo-Romance. The main aim is to propose a split-DP hypothesis for Latin and Italo-Romance. In doing so, we will deal with some properties of both languages related to configurationality, and investigate how these properties correlate with linguistic change.

Since the second half of the nineteenth century, a long tradition of linguistic studies has contrasted the configurationality of Romance languages with the alleged non-con-

figurativeness of Latin. On the one hand, Romance languages have definite and indefinite articles, a less rich morphology than Latin, and a rather constrained word order; syntactically discontinuous constituents are limited to the extraction of possessors and floating quantifiers, and null anaphora are limited to subject pronouns. For these reasons, Romance languages are considered syntax-configurational languages; in other words, they are taken to be structurally complete. On the other hand, Latin is an article-less language and presents richer nominal and verbal morphology, great freedom in word order, discontinuous constituents, and generalized null anaphora. Properties like these may lead to different approaches to Latin syntax. One could hypothesize that syntactic structure is (almost) completely absent from Latin, the order being flexible and regulated by the so-called “communicative dynamism” (Panhuis 1982, Magni 2009, Luraghi 2010, Spevak 2010). This hypothesis sets Latin among the “non-configurational” languages (cf. Hale [1983] for a seminal proposal on Walpiri, an Austronesian language, and Vincent [1988], Ramat [1984], Hewson and Bubeník [2006], and Ledgeway [2012] for a discussion of the [alleged] non-configurationality of Latin). Syntactically non-configurational languages are usually taken to be “pragmatically based” languages (Mithun 1987) in the sense that word order is determined by semantic and pragmatic principles (Givón 1983). In other words, Latin may be included among “discourse-configurational” languages (É. Kiss [1995] for Hungarian), in which the order of the elements obeys pragmatic functions (progression from *datum* to *novum*, topic or focus fronting, etc., cf. Spevak [2010] for an overview of Latin). A second possibility set in the minimalist approach (Chomsky 1995) is to hypothesize that syntactic structure in Latin is “partial” or “defective”, grounded in the fact that the inventory of functional words is limited (cf. Chierchia [1998], Bošković [2005] and following work on the claim that languages of this kind do not display the DP layer in the nominal expression (henceforth NE) and the TP layer in the clause).

Although Latin is different from Romance, we suggest that it is as configurational as Romance. The basic theoretical assumption is that, parallel to the Split-CP hypothesis for the clause (Cinque 1990, Rizzi 1997), the NE also displays a very complex functional structure in its highest layer, including a DP that is split to host discourse features (Giusti 1996; 2010; 2012). Following Giusti (forthcoming) and Giusti and Iovino (forthcoming), we will point out that the functional features of the noun (including Reference) can either all be bundled with the noun or be scattered, giving rise to the two apparently different hierarchical structures illustrated in (1):

- (1) (a) Latin:  $[_{\text{Left Periphery}} \quad \mathbf{I}_{\text{DP}} \quad [_{\text{NP}} \text{N}]]]$   
 (b) Romance:  $\mathbf{I}_{\text{DP}} \quad [_{\text{Left Periphery}} \quad [_{\text{NP}} \text{N}]]]$

In Latin (1a), the absence of an article is due to the fact that the functional features are bundled with N, as the rich morphology suggests. For this reason, the DP is projected below the

Left Periphery. In Romance (1b), Reference and Case are not bundled with N but realized as the article. Thus, Reference and Case project a DP above the Left Periphery.

In providing a configurational account of the syntax of the Latin NE, we give evidence in favor of the hypothesis that Latin and Romance have the same hierarchy of nominal features, the same hierarchy of modification, and the same hierarchy of discourse features in the clause. They also have the same syntactic procedures to combine lexical and functional elements. From this perspective, the parametric change from Latin to Romance is reduced to the way the language realizes syntactic features. Romance languages realize syntactic features via free morphemes (auxiliaries, articles, prepositions, etc.), while Latin mostly prefers bound morphemes (synthetic verbal forms, case morphology, etc.).

This paper is organized as follows. In Section 2, we illustrate the hierarchical structure of nominal features (2.1) and of adjectival modification (2.2) in Latin and Italo-Romance. In Section 3, we give an overview of the word order in the nominal constituents in Latin, old Italian, and modern Italian, mainly focusing on the position of N. The data will be discussed in a strictly comparative fashion, and this will allow us to observe the progressive loss of freedom of word order in the passage from Latin through old Italian to modern Italian. In Section 4, we focus on the diachronic changes of the nominal Left Periphery and present our split-DP hypothesis. Section 5 is devoted to the diachronic loss of discontinuous structures, which can be considered as a direct consequence of the fact that in Romance the Left Periphery is lower than the DP.

## 2. The Hierarchical Structure of Nominal Expressions

### 2.1 The Hierarchy of Nominal Features

Cartographic approaches (Cinque 2002; Belletti 2004; Rizzi 2004) assume that functional hierarchies are universal and that each functional feature heads a separate projection (Cinque and Rizzi 2008). Following Giusti (2002; forthcoming), we propose that the nominal features are Case, Reference, Gender, and Number. They are universally ordered, as in (2), but can be realized in different ways. In Latin (3a), they are all bundled with N, while in Romance (3b), Case and Reference are split from N and realized as the article, while Gender and Number are redundantly realized on both:

(2) [Case [Reference [Number [Gender [Noun]]]]] (Giusti forthcoming)

(3) (a)  $[_{DP} [_{D^{\circ}}]_{[Case, Reference, Number, Gender]} \quad [_{NP} \text{puella}]_{[Case, Reference, Number, Gender]}]$   
           the/a girl.NOM.SG.

(b)  $[_{DP} [_{D^{\circ}} \text{la/le/una/une}]_{[Case, Ref., Num., Gend.]} \quad [_{NP} \text{ragazza/chica/fille}]_{[Num., Gend.]}]$   
           the/a girl

## 2.2 The Hierarchy of Adjectival Modification

Following Giusti (2009; forthcoming), we assume that an NE is formed by merging the head N with a modifying constituent, then Merge can continue with a second modifier, and so on. The adjective closer to the noun restricts the denotation more closely, while an external adjective takes scope above the whole constituent (see Cinque [2010] for a cross-linguistic analysis and Devine and Stephens [2006] for Latin). As for the hierarchical layers of adjectival modification, we give the following sequence:

- (4) [Possessive Adj. [Quantity Adj. [Descriptive Adj. [Relational Adj. [Noun]]]]]

According to (4), Possessive adjectives, such as *meus/mio* “mine,” *suus/suo* “his/her,” *noster/nostro* “our,” etc., are the highest modifiers. They are followed by Quantity adjectives, such as *multus/molto* “many,” *duo/due* “two,” etc., Descriptive adjectives, such as *magnificus/magnifico* “magnificent,” *communis/comune* “common,” etc., and Relational adjectives, such as *forensis/forense* “forensic,” *Romanus/romano* “Roman,” *Graecus/greco* “Greek,” etc.

In Section 3, we consider the positions occupied by the noun with respect to each adjectival modifier in Latin and Italian.

## 3. The Position of the Noun in Latin and in Modern Italian

One of the most apparent features of both Latin and Italo-Romance is the possibility of realizing the noun in different positions.

In Latin, the noun can occupy the low position of the NE, as shown in (5). In fact, it can appear on the right in the linear order, following different kinds of modifiers: Possessive and Descriptive adjectives (5a), Possessive and Relational adjectives (5b), and Demonstrative and Quantity adjectives (5c):

| (5) | Dem.                  | Poss.                | Quant. | Descr.                   | Relat.               | N <sup>1</sup>       |
|-----|-----------------------|----------------------|--------|--------------------------|----------------------|----------------------|
| (a) |                       | tua<br>your-ACC.N.P. |        | magnifica<br>magnificent |                      | <b>verba</b><br>word |
| (b) |                       | meae<br>my-NOM.F.P.  |        |                          | forenses<br>forensic | <b>artes</b><br>arts |
| (c) | hos<br>these-ACC.M.P. |                      |        | multos<br>many           |                      | <b>dies</b><br>days  |

1 (5a) Plaut. *Curc.* 577; (5b) Cic. *orat.* 148; (5c) Plaut. *Pseud.* 8.

This is also the case of Italian. But Italian presents more restrictions: some modifiers must precede the noun (Demonstrative, Possessive, and Quantity adjectives), some are rather freely prenominal or postnominal (Descriptive adjectives), and others are mandatorily postnominal (Relational adjectives), as shown by the ungrammaticality of (6b):

|     |                 |             |               |                           |                     |                       |
|-----|-----------------|-------------|---------------|---------------------------|---------------------|-----------------------|
| (6) | Art./Dem.       | Poss.       | Quant.        | Descr.                    | Relat.              | N                     |
| (a) | le<br>the       | tue<br>your |               | magnifiche<br>magnificent |                     | <b>parole</b><br>word |
| (b) | *le<br>the      | mie<br>my   |               |                           | forensi<br>forensic | <b>arti</b><br>arts   |
| (c) | questi<br>these |             | molti<br>many |                           |                     | <b>giorni</b><br>days |

In Latin, the noun can occupy the middle-low position, preceding a Relational adjective and following different kinds of modifiers: a Quantity adjective as in (7a) or a Possessive as in (7b). Furthermore, the noun can follow more than one modifier, as shown by the very complex NE in (7c), where we find both a prenominal Demonstrative and a prenominal Descriptive adjective. This is also the case of Italian (8):

|     |                       |                      |                        |                   |                          |                        |
|-----|-----------------------|----------------------|------------------------|-------------------|--------------------------|------------------------|
| (7) | Dem.                  | Poss.                | Quant.                 | Descr.            | N                        | Relat. <sup>2</sup>    |
| (a) |                       |                      | multi<br>many-NOM.M.P. |                   | <b>cives</b><br>citizens | fortes<br>strong       |
| (b) |                       | suam<br>his-ACC.F.S. |                        |                   | <b>rem</b><br>situation  | familiarem<br>familiar |
| (c) | illo<br>that-ABL.M.P. |                      |                        | communi<br>common | <b>dolore</b><br>pain    | muliebri<br>feminine   |

<sup>2</sup> (7a) Cic. *Sest.* 1; (7b) Caes. *Gall.* 1,18,4; (7c) Cic. *Cluent.* 13.

| (8) | Dem./Art.    | Poss.      | Quant.        | Descr.           | N                              | Relat.                |
|-----|--------------|------------|---------------|------------------|--------------------------------|-----------------------|
| (a) | i<br>the     |            | molti<br>many |                  | <b>cittadini</b><br>citizens   | forti<br>strong       |
| (b) | la<br>the    | sua<br>his |               |                  | <b>situazione</b><br>situation | familiare<br>familiar |
| (c) | quel<br>that |            |               | comune<br>common | <b>dolore</b><br>pain          | femminile<br>feminine |

In Latin, the noun can also appear in the middle-high position on the left of both a Descriptive and a Relational adjective in this order, as in (9):

| (9) | Dem. | Poss. | Quant. | N                                 | Descr.          | Relat. <sup>3</sup>  |
|-----|------|-------|--------|-----------------------------------|-----------------|----------------------|
| (a) |      |       |        | <b>vocabulum</b><br>word-ACC.N.S. | anticuum<br>old | Graecum<br>Greek     |
| (b) |      |       |        | <b>anulum</b><br>ring-ACC.M.S.    | grandem<br>big  | subauratum<br>golden |

This is impossible in Italian, as the ungrammaticality of the examples in (10) shows:

| (10) | Dem./Art.   | Poss. | Quant. | N                     | Descr.        | Relat.           |
|------|-------------|-------|--------|-----------------------|---------------|------------------|
| (a)  | *la<br>the  |       |        | <b>parola</b><br>word | antica<br>old | greca<br>Greek   |
| (b)  | *?l'<br>the |       |        | <b>anello</b><br>ring | grande<br>big | dorato<br>golden |

In Italian, the NE is well formed if the noun occupies the intra-adjectival position (10'), or if the two postnominal adjectives appear in mirror order, as will be discussed in (16) below:

| (10') | Dem./Art. | Poss. | Quant. | Descr.        | N                     | Relat.           |
|-------|-----------|-------|--------|---------------|-----------------------|------------------|
| (a)   | l'<br>the |       |        | antica<br>old | <b>parola</b><br>word | greca<br>Greek   |
| (b)   | il<br>the |       |        | grande<br>big | <b>anello</b><br>ring | dorato<br>golden |

3 (9a) Gell. 1,18,2; (9b) Petron. 32,3.

In rare cases in Latin the noun can occupy a position on the left of both a Quantity adjective, which occupies a high position in the structure, and a Descriptive adjective, as in (11):

|      |      |       |                 |        |        |                     |
|------|------|-------|-----------------|--------|--------|---------------------|
| (11) | Dem. | Poss. | N               | Quant. | Descr. | Relat. <sup>4</sup> |
|      |      |       | <b>consules</b> | duos   | bonos  |                     |
|      |      |       | consul-ACC.M.P. | two    | good   |                     |

The high position is not available for the noun in Italian, as the ungrammaticality of the examples in (12) shows:

|      |           |       |                |        |        |        |
|------|-----------|-------|----------------|--------|--------|--------|
| (12) | Dem./Art. | Poss. | N              | Quant. | Descr. | Relat. |
|      | *i        |       | <b>consoli</b> | due    | buoni  |        |
|      | the       |       | consul         | two    | good   |        |

Also in this case, the only possible order in Italian is the one with the noun occupying either the position between the Quantity and Descriptive adjectives, or the position between Descriptive and Relational, as in (12’):

|       |           |       |        |                    |        |                    |        |
|-------|-----------|-------|--------|--------------------|--------|--------------------|--------|
| (12’) | Dem./Art. | Poss. | Quant. | N                  | Descr. | N                  | Relat. |
|       | i         |       | due    | { <b>consoli</b> } | buoni  | { <b>consoli</b> } |        |
|       | the       |       | two    | consul             | good   | consul             |        |

Differently from (10) above, in (12’) the postnominal Descriptive adjective is not followed by a Relational adjective.

Finally, in Latin a noun can occupy a very high position, preceding a Possessive adjective as in (13) and other modifiers, such as a Quantity adjective in (13a), a Relational adjective in (13b), and a Descriptive adjective in (13c):

|      |      |                    |       |        |          |                     |
|------|------|--------------------|-------|--------|----------|---------------------|
| (13) | Dem. | N                  | Poss. | Quant. | Descr.   | Relat. <sup>5</sup> |
| (a)  |      | <b>consulatu</b>   | suo   | nono   |          |                     |
|      |      | consulate-ABL.M.S. | his   | ninth  |          |                     |
| (b)  |      | <b>bello</b>       | suo   |        |          | Punico              |
|      |      | war-ABL.N.S.       | his   |        |          | Punic               |
| (c)  |      | <b>familia</b>     | mea   |        | maxima   |                     |
|      |      | family-ABL.F.S.    | my    |        | very big |                     |

<sup>4</sup> Cic. *ad Brut.* 1,3a.

<sup>5</sup> (13a) Suet. *Vesp.* 24,1; (13b) Cic. *Cato* 50; (13c) Cic. *S. Rosc.* 145.

Again, this position is impossible for Italian, as the examples in (14) show:

| (14) | Dem./Art. | N                | Poss. | Quant. | Descr.      | Relat. |
|------|-----------|------------------|-------|--------|-------------|--------|
| (a)  | *il       | <b>consolato</b> | suo   | nono   |             |        |
|      | the       | consolate        | his   | ninth  |             |        |
| (b)  | *la       | <b>guerra</b>    | sua   |        |             | Punica |
|      | the       | war              | his   |        |             | Punic  |
| (c)  | *la       | <b>famiglia</b>  | mia   |        | grandissima |        |
|      | the       | family           | my    |        | very big    |        |

The position available for the noun in Italian is either the low position between the Descriptive and Relational adjectives or the middle-low position, between the Quantitative and Relational adjectives, as shown in (14'). Once again, the postnominal position of a Descriptive adjective is only possible when no Relational adjective is inserted (14'c):

| (14') | Dem./Art. | N | Poss. | Quant. | N                    | Descr.      | N                    | Relat. |
|-------|-----------|---|-------|--------|----------------------|-------------|----------------------|--------|
| (a)   | il        |   | suo   | nono   | { <b>consolato</b> } |             | { <b>consolato</b> } |        |
|       | the       |   | his   | ninth  | consolate            |             | consolate            |        |
| (b)   | la        |   | sua   |        | { <b>guerra</b> }    |             | { <b>guerra</b> }    | Punica |
|       | the       |   | his   |        | war                  |             | war                  | Punic  |
| (c)   | la        |   | mia   |        | { <b>famiglia</b> }  | grandissima | { <b>famiglia</b> }  |        |
|       | the       |   | my    |        | family               | very big    | family               |        |

Starting from the middle-low position illustrated in (7)–(8) for Latin and modern Italian respectively, it is possible to derive the postnominal mirror order of the adjectives both in Latin and in Romance. Examples are given in (15)–(16), where a postnominal Relational adjective precedes a postnominal Descriptive adjective:

| (15) | Dem. | Poss. | Quant. | N                  | Relat.  | Descr. <sup>6</sup> |
|------|------|-------|--------|--------------------|---------|---------------------|
| (a)  |      |       |        | <b>equite</b>      | Romano  | resistente          |
|      |      |       |        | horse-man-ABL.M.S. | Roman   | strong              |
| (b)  |      |       |        | <b>dolia</b>       | olearia | nova                |
|      |      |       |        | jar-ACC.N.P.       | oil     | new                 |

6 (15a) Cic. *Verr.* II 3,36; (15b) Cato *agr.* 69,1.

| (16) | Dem./Art. | Poss. | Quant. | N                | Relat. | Descr.     |
|------|-----------|-------|--------|------------------|--------|------------|
| (a)  | il        |       |        | <b>cavaliere</b> | Romano | resistente |
|      | the       |       |        | horse-man        | Roman  | strong     |
| (b)  | i         |       |        | <b>vasi</b>      | oleari | nuovi      |
|      | the       |       |        | jar              | oil    | new        |

The Latin data in (5), (7), (9), (11), (13), and (15) confirm that the noun can be realized in any pre-adjectival or post-adjectival position. Adjectives obey the hierarchy of adjectival modification both in prenominal and postnominal position; additionally, in postnominal position adjectives can also appear in mirror order.

Unlike Latin, modern Italian presents many restrictions. As shown in (6) and (8), the noun preferably appears in the middle-low position; it can follow a Descriptive adjective but not a Relational adjective, which must be postnominal. Furthermore, in modern Italian the noun can precede two postnominal adjectives that must appear in mirror order (16). The other positions possible in Latin are not available in Italian, as the ungrammaticality of (10), (12), and (14) shows. Note that Quantity adjectives must be prenominal in modern Italian, while postnominal Possessive adjectives are discourse marked (Cardinaletti 1998; Giusti 2008).

In the next section, we give a formalization of the empirical data, proposing some syntactic structures that can explain the different linear orders, and illustrate that the free orders of Latin are not random, but strictly controlled by a precise syntactic structure.

### 3.1 Deriving Word Order in Latin and Modern Italian

The structure in (17) represents the hierarchy of modification proposed in (4). Following Giusti (2009), N remerges with all modifiers and can be realized in any of the remerge positions:

$$(17) \left[ {}_{\text{NP}} \text{AP}_{\text{PossP}} \text{N} \left[ {}_{\text{NP}} \text{AP}_{\text{Quant}} \text{N} \left[ {}_{\text{NP}} \text{AP}_{\text{Descr.}} \text{N} \left[ {}_{\text{NP}} \text{AP}_{\text{Relat.}} \left[ \text{N} \right] \right] \right] \right] \right] \right]$$

In what follows, we do not project silent intermediate projections. All the logical possibilities are illustrated in (18), where we give the structure of some of the Latin examples discussed above:

$$(18) (a) \left[ {}_{\text{NP}} \left[ {}_{\text{PossP}} \text{meae} \right] \text{N} \left[ {}_{\text{NP}} \left[ {}_{\text{APRelat.}} \text{forenses} \right] \left[ {}_{\text{N}} \text{artes} \right] \right] \right] \quad (5b)$$

$$(b) \left[ {}_{\text{NP}} \left[ {}_{\text{PossP}} \text{suam} \right] \left[ {}_{\text{N}} \text{rem} \right] \left[ {}_{\text{NP}} \left[ {}_{\text{APRelat.}} \text{familiarem} \right] \left[ {}_{\text{N}} \text{rem} \right] \right] \right] \quad (7b)$$

$$(c) \left[ {}_{\text{NP}} \text{equite Romano} \left[ {}_{\text{APDescr.}} \text{resistente} \right] \left[ {}_{\text{NP-e}} \left[ {}_{\text{APRelat.}} \text{Romano} \right] \left[ {}_{\text{N-e}} \right] \right] \right] \quad (15a)$$

(d)  $[_{NP} \text{vocabulum} [_{NP} [_{APDescr.} \text{anticuum}]] \text{v}^- [_{NP} [_{APRelat.} \text{Graecum}]] [_N \text{v}^-]]]$  (9a)

(e)  $[_{NP} \text{consules} [_{NP} [_{APQuant} \text{duos}]] \text{consules} [_{NP} [_{APDescr.} \text{bonos}]] [_N \text{consules}]]]$  (11)

(f)  $[_{NP} \text{bello} [_{NP} [_{PossP.} \text{suo}]] \text{bello} [_{NP} [_{APRelat.} \text{Punico}]] [_N \text{bello}]]]$  (13b)

(18a) represents the low position of the noun, which is realized in its first-merge position preceded by the Relational adjective. In (18b), we see the noun realized in the middle-low position to the left of the Relational adjective. Example (18c) illustrates the mirror order of adjectives, which, according to Cinque (2010), is derived by moving an intermediate projection of NP to the left of the Descriptive adjective (also cf. [19b] below). In (18d), we see the realization of the single head N to the left of the Descriptive adjective. In (18e)–(18f) N is realized even higher, to the left of a Quantity and a Possessive adjective respectively.

As we have shown in (6b) above, Italian does not display the noun in the first-merge position preceded by a Relational adjective. The possible and impossible positions of N in (19) confirm that the positions that are possible for the noun in Italian are either the middle-low position between a postnominal Relational adjective and a prenominal Descriptive adjective, as in (19a), or the one in which the noun precedes two postnominal adjectives that must appear in mirror order (Relational > Descriptive adjective):

(19) (a)  $[_{DP} [_{D^0} \text{le}]] [_{NP} \{*\text{parole}\}] [_{NP} [_{PossP.} \text{tue} \{*\text{parole}\}]] [_{NP} [_{QP} \text{tante} \{*\text{parole}\}]] [_{NP} [_{APDescr.} \text{bellissime} \text{parole}]] [_{NP} [_{APRelat.} \text{poetiche} \text{parole}]] \dots$

(b)  $[_{DP} [_{D^0} \text{le}]] [_{NP} [_{PossP.} \text{tue}]] \text{N} [_{NP} [_{APQuant} \text{tante}]]$   
 $[_{NP} \text{parole} \text{poetiche}]] [_{NP} [_{APDescr.} \text{bellissime}]]$   $[_{NP} \text{parole}]] [_{APRelat.} \text{poetiche}]] [_{NP} \text{parole}]]$

↑

### 3.2 Word Order in Old Italian

The orders that are possible in modern Italian are also possible in old Italian. In (20), we give an example in which the noun occupies the middle-low position. It is reasonable that this is the unmarked order for the noun in old Italian, exactly like in modern Italian:

(20)  $[_{DP} \text{la}]] [_{NP} [_{APNum.} \text{terza}]] \text{battaglia} [_{NP} [_{APRelat.} \text{cittadina}]] \text{[battaglia]]]$

Old Italian is less restrictive than modern Italian in the placement of the noun. In Latin and in old Italian N can be realized below a Relational adjective, as shown in (21a), as well as above the possessive (21b):

(21) (a)  $[_{DP} \text{la}]] [_{NP} [_{APRelat.} \text{francese}]] \text{[casa]]]$   
 the French house (Monte Andrea, *Rime*, son. 101, vv. 10–11)

- (b) [<sub>DP</sub> uno [<sub>NP</sub> cavallo [<sub>NP</sub> [<sub>POSSP</sub> suo] cavallo [<sub>NP</sub> [<sub>APRelat</sub> morello] cavallo]]]]  
 a horse his brown (*Libro Giallo* 308,14)

As we have seen in (6b) and (14) above, neither of these possibilities is admitted in modern Italian, where N occupies an intermediate position in the modification hierarchy:

- (22) (a) la casa francese  
 the house French
- (b) il suo cavallo marrone  
 the his horse brown

#### 4. The Nominal Left Periphery and the Split-DP Hypothesis

As shown in Giusti and Iovino (forthcoming), despite its lack of articles and very free word order, in many respects Latin behaves like its daughter languages, all of which have articles. They solve this apparent paradox by proposing a complex nominal structure made up of a DP, which hosts overt demonstratives, and a left-peripheral projection, parallel to the split CP in clauses. This split DP, based on Giusti (1996; 2006), can account both for the freedom of the orders found inside the NE and for discontinuous NEs.

Giusti and Iovino (forthcoming) also claim that the Latin Left Periphery appears higher than the DP and can be occupied by maximal projections that are modifiers of the noun and not the noun itself. This proposal can capture the following facts: when present, the demonstrative is the highest modifier (in the unmarked case); when the demonstrative is in second position, in Latin we usually find one adjective of any class preceding it; only one element at a time can precede the demonstrative; a noun precedes the demonstrative only if no other modifier is present; an adjective can be extracted out of the NE and dislocated to the left.

Starting from the basic order, which we assume to be *illa vetere disciplina* (lit. ‘that old discipline’; cf. Iovino [2011; 2012; forthcoming]), in Latin the Relational adjective can be dislocated to the Left Periphery indicated in (1), which we name LPP (Left Periphery projection) in (23). The head LP is null, and checks by spec-head agreement a contrast<sup>7</sup> feature on the adjective:

<sup>7</sup> Giusti (2006), following suggestions by Annarita Puglielli and Valeria Molnar, claims that the only discourse pragmatic feature in NEs can be Contrast, Topics, and Focus being a property of the clause. Contrast is also a versatile feature that can combine with Topic and Focus. In his rhetoric about ‘the good old days,’ which apparently were already a *topos* two thousand years ago, Cicero contrasts the old jurisdiction, *vetere disciplina* in (23), which permitted the punishment of criminals, with the current one, which was supposedly less strict. In (24b) *bionde* is prosodically emphatic, while in (25b) *diritto* (right) is clearly contrasted with *sinistro* (left) in (25a).

- (23) [<sub>LPP</sub> **vetere** [<sub>DP</sub> illa [<sub>NP</sub> [<sub>PossP</sub>] N [<sub>NP</sub> [<sub>APQuant</sub>] [<sub>NP</sub> [<sub>APDescr.</sub> **vetere**] [<sub>N</sub> disciplina]]]]]]]  
 (Cic. *Cluent.* 76)

In Italian, Case and Reference are split from N (since they are realized on the article) (24a). For this reason, the Left Periphery is lower than the article, which we merge as the head of D. Giusti (1996; 2006) has shown that a contrasted adjective can be moved to the LPP, which is realized to the left of a high possessive (24b):

- (24) (a) [<sub>DP</sub> le [<sub>NP</sub> sue N [<sub>NP</sub> lunghe trecce [<sub>NP</sub> bionde ~~trecce~~]]]]]  
 the her long blond braids
- (b) [<sub>DP</sub> le [<sub>LPP</sub> **bionde** LP [<sub>NP</sub> sue N [<sub>NP</sub> lunghe trecce [<sub>NP</sub> **bionde** ~~trecce~~]]]]]  
 the blond her long braids

In old Italian, the situation is similar but not identical. We observe a high position of N, shown in (21b) and in (25a), which is not possible in modern Italian (19a). Interestingly, this position appears to be in complementary distribution with the left peripheral adjective that we observe in (25b):<sup>8</sup>

- (25) (a) [<sub>PP</sub> co[<sub>DP</sub> -I [<sub>NP</sub> corno [<sub>NP</sub> [<sub>PossP</sub> tuo] **corno** [<sub>NP</sub> [<sub>AP</sub> **sinistro**] **corno**] . . . ]]  
 with-the wing your left
- (b) [<sub>PP</sub> co[<sub>DP</sub> -I [<sub>LPP</sub> **diritto** [<sub>NP</sub> [<sub>PossP</sub> tuo] corno [<sub>AP</sub> **diritto** [<sub>NP</sub> **corno**] . . . ]]  
 with-the right your wing right

Thus, it seems that the discontinuous realization of Case and Reference correlates with an internal position of LPP and favors a lower realization of N in modern Italian. The intermediate step witnessed in old Italian seems to present a complementary distribution between a high merge of N and the possibility of fronting a contrasted AP to the Left Periphery:

- (26) (a) [<sub>DP</sub> art [<sub>NP</sub> N [<sub>NP</sub> [<sub>AP</sub><sub>poss</sub> ~~N~~ [... ]]]]]]  
 (b) [<sub>DP</sub> art [<sub>Left Periphery</sub> [<sub>NP</sub> [<sub>AP</sub><sub>poss</sub> N [... ]]]]]]

<sup>8</sup> Bono Giamboni, *Vegezio*, book 3, chap. 20, p. 128.



## 6. Conclusions

We have shown that Latin word order is free but not unconstrained. The syntactic phenomena we discussed are best accounted for by a syntax configurational approach.

From the diachronic point of view, in the passage from Latin to Italo-Romance it is possible to observe a progressive loss of word orders. In Section 3, we showed that some of the positions available for the noun in Latin are residually possible in old Italian and impossible in modern Italian.

In Section 4, we argued that the split-DP hypothesis can account both for the freedom of orders found inside the NE and for the occurrence of discontinuous NEs. In particular, we discussed the change of the nominal Left Periphery from Latin to Italian. In the former, it is higher than the DP, in the latter it is entrapped in the NE as a result of the creation of the article.

Finally, in Section 5, we considered the loss of different kinds of discontinuous constituents, which are completely excluded from both old and modern Italian.

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## Latin Primary Sources

- Caes. *Gall.* = Caesar, *De Bello Gallico*  
 Cato *agr.* = Cato, *de Agri Cultura*  
 Cic. *ad Brut.* = Cicero, *ad Brutum*  
 Cic. *Cael.* = Cicero, *Pro Caelio*  
 Cic. *Cato* = Cicero, *Cato Maior de Senectute*  
 Cic. *Cluent.* = Cicero, *Pro Cluentio*  
 Cic. *orat.* = Cicero, *Orator*  
 Cic. *S. Rosc.* = Cicero, *Pro Roscio Amerino*  
 Cic. *Sest.* = Cicero, *Pro Sestio*  
 Cic. *Verr.* = Cicero, *In Verrem*  
 Gell. = Gellius, *Noctes Atticae*  
 Petron. = Petronius, *Satyricon Liber*  
 Plaut. *Curc.* = Plautus, *Curculio*  
 Plaut. *Pseud.* = Plautus, *Pseudolus*  
 Suet. *Vesp.* = *Divus Vespasianus*

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# Four Kinds of Object Symmetry

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**Abstract:** This paper examines cross-speaker and cross-dialectal variation in object symmetry effects in three Germanic languages, English, Norwegian, and Swedish. We argue that object symmetry effects are not a unified phenomenon, but rather that the availability of locality obviating theme movement out of applicative structures has different sources in different constructions. Both case-based and locality-based explanations are needed to model the attested variation. An additional goal of the paper is to describe a new shape conservation effect in object shift contexts. Theme-goal orders in Norwegian object shift obtains if and only if the theme and goal invert vP-internally. This effect is predicted by Fox and Pesetsky's (2005) Cyclic Linearization model.

**Keywords:** passive; applicative; locality; A-movement; linearization.

## 1. Introduction

This paper focuses on the passive symmetry problem, that is, the problem of explaining cross-linguistic variation in the availability of passive movement out of double object constructions (DOCs). A phenomenon much studied in the comparative syntactic literature of the last three decades is that languages with DOCs fall into one of two main classes with respect to passive movement. One class of language, typically called "asymmetric passive" languages, allows for passivization of goal arguments out of DOCs, but not theme arguments. We illustrate this in (1) from one such language, Danish:

- (1) (a) Jeg blev givet fem ting.  
 I was given five things  
 "I was given five things." [Goal passives]

- (b) \*Fem ting blev givet mig.  
 five things were given me  
 “Five things were given me.” [Theme passives]

A second class of languages, typically called “symmetric passive” languages, allows for passivization of both theme and goal arguments out of DOCs as illustrated in the Norwegian example in (2).

- (2) (a) Jeg ble gitt Paralgin Forte.  
 I was given Paralgin Forte  
 “I was given Paralgin Forte.” [Goal passives]

- (b) Lånet ble gitt meg.  
 the.loan was given me  
 “The loan was given me.” [Theme passives]

The problem, then, is to understand the source of the cross-linguistic variation that makes theme passives bad in asymmetric passive languages but good in symmetric passive languages. The extensive generative literature on this topic has generally pursued one of two types of explanations. One approach, which we will call the *case-based approach*, models the variation in terms of differences in the way that case is assigned to objects. In passive sentences, on this view, passive morphology “absorbs” case assigned to objects in active contexts, and the case-less object instead receives nominative case and raises to TP (Baker 1988; Woolford 1993; Citko 2008). In asymmetric passive languages, passive morphology can absorb the case destined for either the goal or the theme argument, with the result that either argument can raise to subject position. In symmetric passive languages, only the case destined for the goal is absorbed, and hence only the goal may passivize.

A second approach to the variation between (1) and (2) is in terms of intervention and is often called the *locality approach* (Ura 1996; McGinnis 1998; Anagnostopoulou 2003). On this approach, what blocks theme passivization in asymmetric languages is intervention by the goal argument, whose categorial or phi-features block movement of the Theme to subjects position as in (3). What fixes this problem in symmetric passive languages is the availability of some locality obviating movement.

- (3) Passivisation of Theme is ruled out by Locality  
 $[_{TP} T [_{vP} \dots [ \text{Goal} ]_{[F]} \dots [ \text{Theme} ]_{[F]} ]]]]$

All previous work on the passive symmetry problem that we are aware of has (quite sensibly) pursued a single such explanandum providing a unified account of all object

symmetry effects. Nevertheless, it could well be that multiple sources of variation exist, that is, that there are multiple types of (a)symmetric passive languages. This paper considers evidence from cross-dialectal variation in Germanic suggesting that, indeed, (at least) four different kinds of object symmetry exist. That is, there exist several different mechanisms in these varieties for moving the theme across the goal without violating locality.

The discussion is organized as follows. Section 2 discusses results from a judgment experiment with British English speakers reported in Haddican and Holmberg (2012). Section 3 reports results from a new experiment focusing on object symmetry effects in Norwegian. Section 4 discusses passive symmetry in Swedish.

## 2. British English

Several sources in the literature on passive symmetry have noted that some speakers of British English dialects accept theme passive sentences like (4) in addition to goal passive sentences like (5) (Anagnostopoulou 2003; Doggett 2004, 95; McGinnis 1998, 146–49; 2001; Ura 1996, 169–76; Biggs 2013).

(4) The ball was given the girl.

(5) The girl was given the ball.

Less well described in the formal literature is the fact that some dialects of Northern and Western England also allow theme-goal orders in active contexts, as in (6) (Doggett 2004; Haddican 2010; Haddican and Holmberg 2012; Biggs 2013; Myler 2013). In some dialects, these sentences behave like true double object constructions on standard diagnostics, including verb class restrictions, the availability of inanimate goals, and Person Case Constraint effects. In other dialects, such sentences behave like prepositional dative constructions, perhaps with a silent TO preposition (Haddican 2010; Biggs 2013; Myler 2013).

(6) The girl gave it me.

The dialects/speakers for which sentences like (6) behave like true DOCs suggest support for one version of the locality hypothesis. Ura (1996), McGinnis (1998), and Anagnostopoulou (2003) propose that theme passivization is fed by short, locality-obviating movement of the theme to an outer specifier of the same projection hosting the goal. From this intermediate position, the theme can raise to TP without crossing the goal argument as in (7). DOC examples such as (6) suggest support for this approach in that they seem to provide independent evidence of short theme movement to a position above the goal.

## (7) Short theme movement on the locality approach

$$[_{TP} \text{Theme T } [_{XP} \text{Theme } [ \text{Goal X} \dots [ \text{Theme } ]]]]$$

If, indeed, theme-goal ditransitives like (6) are related to theme-passives according to the approach illustrated in (7), then we expect the acceptability of these two sentence types to correlate across speakers. That is, speakers should accept theme passive sentences like (4) if and only if they accept theme-goal ditransitives. Haddican and Holmberg (2012) report on a judgment experiment with 136 native speakers of British English designed to test this prediction. The experiment crossed two factors: object order (theme-goal vs. goal-theme) and context (active vs. passive).<sup>1</sup> The results revealed a positive correlation between acceptance of theme-goal orders in passive and active contexts as expected on the locality approach. The data nevertheless suggest a richer inventory of grammars than the two-dialect distribution entailed by (7). In particular, accepting Theme-Goal passives entailed accepting theme-goal orders in active contexts, but not vice-versa. We summarize the pattern of responses in Table 1. Importantly, the fact that some speakers accept theme-goal orders in active but not passive contexts (Grammar 3-shaded) suggests that the derivation in (7) is insufficient to explain the facts. Some other parameter of variation appears required. The fourth possible pattern—acceptance of theme passives but not theme-goal orders in active contexts—is unattested in Haddican and Holmberg’s results.

| Grammar | Theme-goal actives | Theme passives |
|---------|--------------------|----------------|
| 1       | *                  | *              |
| 2       | Ok                 | Ok             |
| 3       | Ok                 | *              |
| 4       | *                  | Ok             |

**Table 1.** Availability of theme-goal orders in active and passive contexts (adapted from Haddican and Holmberg [2012]).

As a starting point for our account, we note that, in active contexts, theme-goal ditransitives are accepted most readily when the theme argument is the weak pronoun, *it*. In the relevant dialects, theme-goal orders with stressed pronouns and full DPs are sharply degraded. Many speakers also find theme-goal orders with unstressed *it* better than *them*.

1 To test whether theme-goal orders behaved as DOCs or prepositional datives, the experiment included a separate subdesign crossing object order (theme-goal vs. goal-theme) with verb class: “*donate-class*” verbs for which DOCs are typically poor and “*give-class*” verbs which allow them. Subjects for whom *donate-class* verbs were degraded in the theme-goal order were excluded from the analysis since for these speakers theme-goal orders behaved as prepositional datives. See Haddican and Holmberg (2012) for experimental details.

- (8) (a) They sent it the wrong person.  
 (b) \*She gave the books me.  
 (c) \*She gave THEM me.

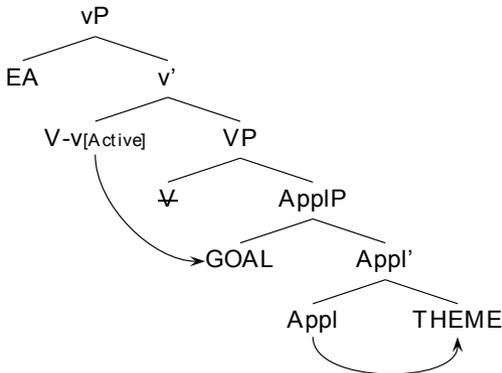
Haddican and Holmberg’s analysis has two main components. First, following Roberts (2010), they propose that theme-goal inversion in active contexts is derived by incorporation of the clitic pronoun *it* into its phi-probe—its source of case—which we take to be *v*. When the features on a phi-probe are a superset of those on a matching goal, the former becomes a copy of the latter through feature valuation, and is spelled out in position of the latter. This will be the case with weak pronouns like *it*, which consist exclusively of phi-features matching those on *v*. In the case of full DP objects which have additional content, agreement and valuation will not produce such identical copies in the position of the probe and goal, and the object will spell out in its lower position.

Second, Haddican and Holmberg propose that the locus of variation governing theme-goal orders in active and passive contexts is whether the “extra” source of case in double object constructions is Appl or rather a null prepositional head, labeled Linker (Lk) in Haddican and Holmberg (2012), that takes ApplP as its sister.

Let us now illustrate how these assumptions help to model the inventory of grammars in Table 1. We begin by considering the standard pattern, Grammar 1, where the objects are ordered theme-goal in both active and passive contexts. The analysis for such sentences is a fairly standard one. Here, in active contexts, Appl will agree with the theme and *v* will agree with the goal in the usual way. We illustrate this proposal in (10), which illustrates the lower portion of a standard English DOC sentence like (9). (Arrows denote probe-goal relations.)

- (9) She gave the girl the ball.

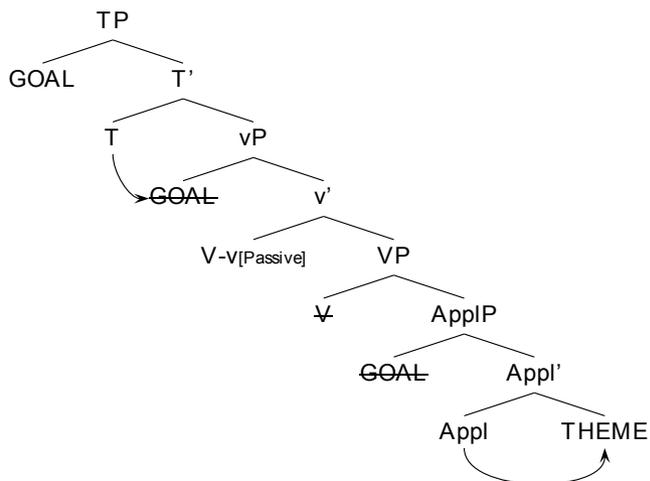
- (10) Grammar 1, active contexts



In passive contexts, *v* is not a case assigner and no external argument (EA) is merged, so the goal argument raises to TP (via the edge of the *v*P phase), where it receives nominative case. We illustrate this in (12), which corresponds to a sentence like (11) (repeating [5]).

(11) The girl was given the ball.

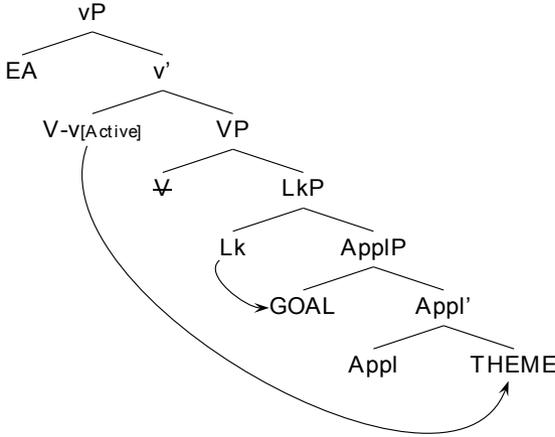
(12) Grammar 1, passive contexts



Grammar 2—the grammar of speakers with theme-goal orders in both active and passive contexts—will differ minimally from Grammar 1 in that the “extra” probe in applicative contexts will be the linker morpheme, rather than Appl. (See Baker and Collins [2006] for an extensive discussion of such morphemes in Niger-Congo and Khoisan languages where these morphemes are overt.) When the linker morpheme is merged it will probe the closest element with unvalued matching features, namely the goal argument. The theme argument will be probed by *v* across the now inactive goal argument—that is, with no defective intervention effect (Richards 2004; Broekhuis 2007; Bruening 2014). In cases where the theme is the weak pronoun, *it*, it will incorporate into its probe, *v*, giving the order V-theme-goal as in (13) (which repeats [6]). We illustrate this proposal in (14).

(13) The girl gave it me.

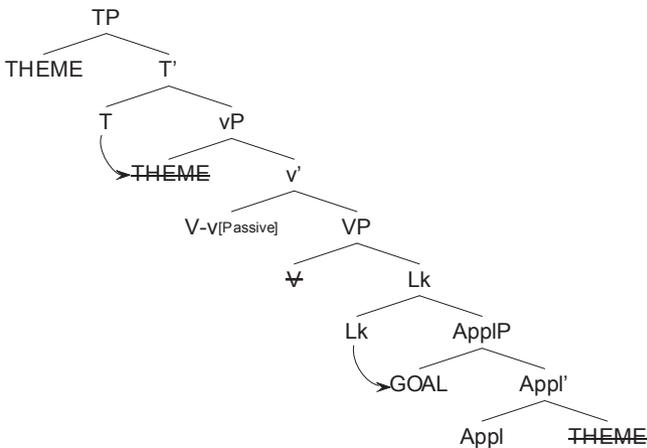
(14) Grammar 2, active contexts



In passive contexts, Grammar 2 will generate theme-passive sentences if, as we have proposed above for Grammar 1, *v* has an EPP feature that raises the theme—the goal being inactive—to *vP*. We illustrate this in (16), which derives the theme passive example in (15) (repeating [4]). Grammar 3—the pattern of speakers with theme-goal orders in active but not passive contexts—will differ from Grammar 2 in lacking an EPP feature on passive *v*. The theme will then be trapped in the lower phase and will not be able to raise to TP.

(15) The ball was given the girl.

(16) Grammar 2, passive contexts



The unattested Grammar 4—with theme-goal orders in passive but not active contexts—will be blocked on this approach, since the linker, which is crucial to the availability of theme-goal orders in passives, will necessarily allow for incorporation of weak pronouns on the assumptions introduced. A grammar producing theme-goal orders in passive but not active contexts is therefore correctly excluded.

To summarize the discussion so far, we have described two ways of deriving object symmetry without violating locality. One such case involves active contexts, where a null linker morpheme together with clitic incorporation into a higher *v* produces verb-theme-goal surface orders in cases where the theme is a clitic. A second case involves passive contexts, where movement of the theme to the edge of *vP* is possible because the goal is previously deactivated. We consider evidence for a third such mechanism in the following section focusing on Norwegian.

### 3. Norwegian

In the previous section, we considered one possible source of evidence in favor of the locality approach to theme passivization, namely the fact that some British English dialects with theme passives also permit theme-goal orders in active contexts. Anagnostopoulou (2003; 2005) argues for the locality approach based on a similar set of facts from Mainland Scandinavian languages. In particular, she notes a cross-linguistic correlation within these varieties between acceptance of theme passives and availability of theme-goal orders in object shift (OS), which we describe shortly. Norwegian and Swedish, which both allow theme passivization (Norwegian robustly, Swedish more marginally), also marginally allow for theme-goal orders in OS contexts. Danish, which does not have theme passivization, appears to lack theme-goal OS altogether. Anagnostopoulou (2003) takes these facts to indicate that the short theme movement in (7) that feeds theme passivization cross-linguistically also feeds theme-goal orders in Mainland Scandinavian. Where such short theme movement is not possible (e.g., Danish) theme-goal orders are excluded in both passives and OS.

Anagnostopoulou's approach makes a strong prediction about cross-speaker variation, namely that the same speakers who accept theme-goal orders in OS will accept theme-goal orders in passives and vice-versa. In this section, we report on a recent judgment experiment with native speakers of Norwegian, similar to that just described for British English, designed to test this prediction.

Participants in the experiment were 500 self-described native speakers of Norwegian, 18–81 years old, recruited online by the researchers. We did not require subjects to be linguistically naïve.

The experiment crossed two factors: *object order*, with levels goal-theme theme-goal, and *context*, with three levels: passives, active OS, and active non-OS. Object shift refers to contexts where the finite verb and pronominal objects raise out of *VP*, as diagnosed by their position relative to low adverbs. Example (17a) shows that the weak pronominal object *den* can raise out of the verb phrase—as shown by its position to the left of the negative

adverbial *ikke*—but it can only do so if the verb also raises. Example (17b) shows that in the perfect, where the main verb stays inside the VP, the object cannot raise, but rather must stay in its first-merged position, as in (17c). The sensitivity of object shift to verb movement is typically referred to as “Holmberg’s Generalization” (Holmberg 1986).

- (17) (a) Jeg så den ikke.  
I saw it not  
“I didn’t see it.”
- (b) \*Jeg har den ikke sett.  
I have it not seen  
“I haven’t seen it.”
- (c) Jeg har ikke sett den.  
I have not seen it  
“I haven’t seen it.”

Along with passive sentences and OS sentences, the experiment included unshifted (non-OS) active sentences as baseline against which to compare acceptability of the two movement conditions. We summarize these six conditions in Table 2.

|                      | Theme-goal   | Goal-theme   |
|----------------------|--|--|
| <b>Passives</b>      | Den ble gitt ham.<br>It was given him<br>“It was given him.”                               | Han ble gitt den.<br>He was given it<br>“He was given it.”                                 |
| <b>Active OS</b>     | Elsa ga den ham ikke.<br>Elsa gave it him not<br>“Elsa didn’t give it to him.”             | Elsa ga ham den ikke.<br>Elsa gave him it not<br>“Elsa didn’t give it to him.”             |
| <b>Active non-OS</b> | Elsa har ikke gitt den ham.<br>Elsa has not given it him<br>“Elsa hasn’t given it to him.” | Elsa har ikke gitt ham den.<br>Elsa has not given him it<br>“Elsa hasn’t given it to him.” |

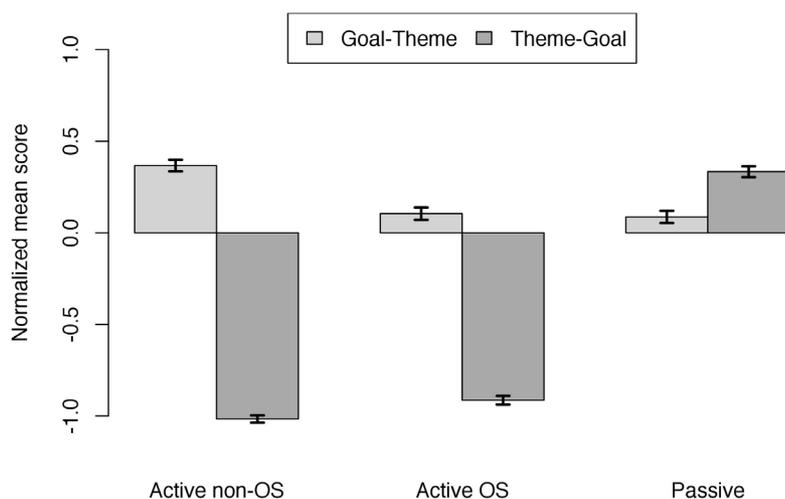
**Table 2.** Examples of six experimental conditions

All theme and goal arguments in the experiment were 3rd person pronouns. Theme and goal interpretations were biased using animate pronouns (to bias goals) and inanimates (for themes). Twelve lexicalizations were created for each of these six conditions and blocked and assigned to lists by Latin square. Each subject saw four items per condition for a total of 24 critical items. (Each subject saw each lexicalization twice.) These 24 sentences were pseudo-randomized with 24 fillers, half of which were grammatical

and half ungrammatical. Subjects were pseudo-randomly (using a counter mechanism) assigned to lists by the software used, Ibx Farm (Drummond 2013).

The experiment was self-paced, conducted online in the spring of 2013. Subjects judged each sentence on an 11-point (0–10) scale with points arranged horizontally left to right and endpoints labeled *dårlig* “bad” and *god* “good,” respectively. Raw results were normalized by converting to z-scores based on by-speaker means and standard deviations of the filler scores.

Figure 1 plots mean scores and 95% confidence intervals for our six conditions. Zero on the y-axis corresponds to the mean scores for the fillers, half of which, again, were grammatical and half ungrammatical. Zero on the y-axis might therefore be taken as a rough midpoint of acceptability. The figure shows that theme-goal orders are on aggregate quite bad in the active conditions. In passives, on the other hand, both theme-goal and goal-theme orders are generally good, with theme-goal orders judged slightly better.

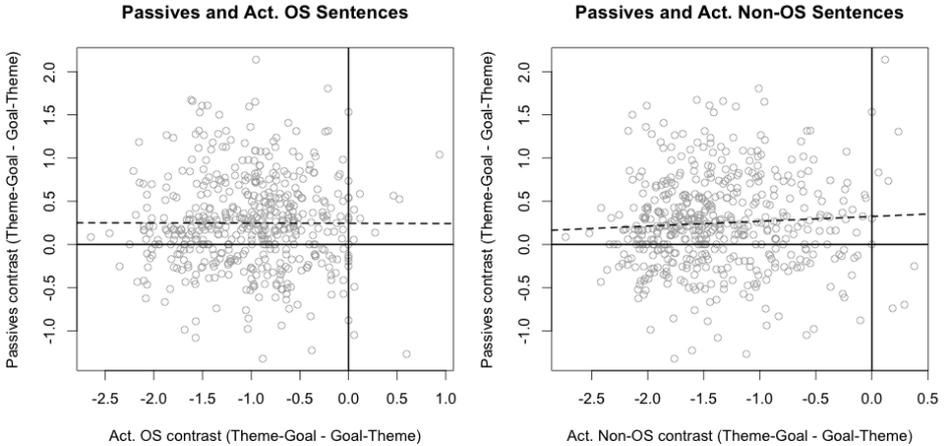


**Figure 1.** Mean scores and 95% CIs for six conditions

Figure 2 plots the comparisons most relevant for testing predictions of the locality hypothesis, namely by-subject correlations in acceptability scores of theme-goal orders in active and passive conditions. The x-axis in the two plots represents the by-subject contrast between theme-goal orders and goal-theme orders in OS and non-OS active conditions, that is, taking the mean normalized score for theme-goal orders minus the mean normalized score for goal-theme orders.<sup>2</sup> The y-axis corresponds to this same contrast in passive contexts. Zero on each axis—marked with a solid line in the plots—

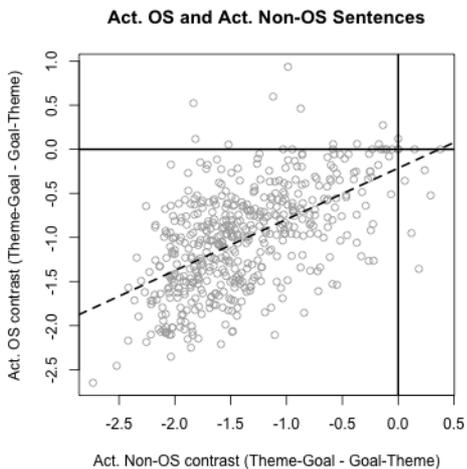
<sup>2</sup> We chose this measure to control for variation across speakers in relative acceptability of passive vs. active sentences.

therefore corresponds to equal acceptance of theme-goal and goal-theme orders in each condition. The broken line is a regression line fit by ordinary least squares regression. The plots show no correlation across speakers in acceptance of theme-goal orders in active and passive contexts ( $r = .01$ ,  $p = .897$ , for the active OS plot,  $r = .06$ ,  $p = .153$  for the non-OS plot).



**Figure 2.** By-subject contrasts in actives and passives

Figure 3 plots the correlation between active OS and active non-OS scores (again, by-speaker contrasts between theme-goal and goal-theme orders). The figure shows a highly significant positive correlation between the two conditions ( $r = .57$ ,  $p < .0001$ ), indicating that participants tend to accept theme-goal orders in OS sentences if and only if they accept theme-goal orders in active non-OS sentences.



**Figure 3.** By-subject contrasts in OS and non-OS actives

The results in Figure 1, therefore, suggest no support for Anagnostopoulou's proposal that short theme movement feeds theme-goal orders in both OS and passives. This approach, again, predicts a cross-speaker correlation in acceptance of theme-goal orders in these two contexts, contrary to the present results. The results from Figure 2, however, do support a relationship between theme-goal orders in OS and active non-OS contexts. In particular, the results suggest that the same movement operation responsible for theme-goal orders vP-internally—in non-OS contexts—feeds theme-goal orders in OS. Intriguingly, this object order preservation effect applies in the same environments (OS contexts) as HG, which preserves the relative order of verbs and objects.

One initially appealing approach to these order preservation facts is that some movement operation permutes the order of the objects vP-internally and that, in OS, a constituent containing these two elements raises them out of vP, as in (18).

(18) [<sub>TP</sub> [<sub>XP</sub> THEME GOAL] . . . [<sub>XP</sub> ~~THEME GOAL~~ THEME ]]]

Nevertheless, the fact that shifted objects can be separated by an extra-VP adverb like *sjølsagt* ‘obviously,’ as in (19), suggests that objects do not raise as a constituent, but rather independently.

(19) Jeg ga ham sjølsagt den ikke.  
I gave him obviously it not  
‘Obviously, I didn't give it to him.’

We propose that these results are best expressed in terms of shape conservation, the idea that certain movement operations—in this case OS—cannot change the order of elements established at a prior level (Sells 2001; Richards 2004; Fox and Pesetsky 2005; Engels and Vikner 2013). There are several different formal implementations of this idea, and here we adopt Fox and Pesetsky's (2005) cyclic linearization proposal, originally formulated in view of Holmberg's Generalization effects. Fox and Pesetsky propose that linearization maps precedence relations among syntactic objects that are established phase-by-phase. Extra-phasal movement cannot change a precedence relation between two syntactic objects established in a previous phase, since this would entail conflicting ordering relations for linearization:

(20) (a) [<sub>Phase2P</sub> X Y [<sub>Phase1P</sub> X̄ Ȳ ] ] → X > Y

(b) \* [<sub>Phase2P</sub> Y X [<sub>Phase1P</sub> X̄ Ȳ ] ] → X > Y, Y > X

OS appears to target a position outside of vP (which we take to be a phase), given that the landing site of OS is above negative adverbials like *ikke*. As Holmberg (1999, 6) notes, the merged position of *ikke* appears to be above the first merged position of *have*-auxiliaries in embedded contexts, which lack verb movement, as in (21). Assuming that such auxiliaries are merged outside of vP, then such sentences suggest that *ikke*, and therefore the position targeted by OS, must also be outside vP.

- (21) Det er mulig at Per ikke har kysset henne.  
 It is possible that Per not has kissed her  
 “It is possible that Per hasn’t kissed her.”

Given that OS is to a position outside the vP phase, Fox and Pesetsky’s proposal immediately provides the desired result, namely that theme-goal orders in OS are possible if and only if the theme and goal invert inside the lower phase. Let us assume, in particular, that theme-goal orders reflect theme movement to an outer spec of Appl. OS will then preserve the order of the objects, as illustrated in (22).

- (22) [<sub>TP</sub> . . . THEME . . . GOAL [<sub>vP</sub> v . . . [<sub>ApplP</sub> THEME [<sub>ApplP</sub> GOAL [<sub>Appl</sub> Appl THEME]

The results in Figure 2, again, suggest that theme passivization in Norwegian must be partly independent of the mechanism responsible for theme-goal orders in OS. We propose that theme-passivization is not fed by this short theme movement, but rather, like in British English, reflects variation in whether the extra case in applicative structures is located on Appl or a Linker head above ApplP, where it assigns case to the goal argument. In passives, v cannot assign case, but can probe and attract the theme across the deactivated goal, just as in (16) for British English passives.

The derivation of theme-goal orders in active (OS and non-OS) contexts in Norwegian therefore differs from that for passive contexts and theme-goal orders in British English. Our analysis of the Norwegian actives results entails a third way of inverting object order in applicative structures without violating locality, namely raising the theme to an outer spec of the same ApplP in which the goal is merged. This proposal, then, is close in spirit to the classic locality “escape hatch” solution as in (7) (Ura 1996; McGinnis 1998; Anagnostopoulou 2003).

The proposals for British English passives and theme-goal DOCs, as well as Norwegian passives, have so far depended crucially on variation in the placement of the extra source of case in applicative constructions, that is, whether a linker morpheme is merged above ApplP. However, we have not so far provided any independent evidence for such a head. We suggest that evidence to this effect can be found in Swedish passives, which we turn to next.

## 4. Swedish

In Swedish, simple theme passive constructions like (23) are generally quite degraded with monomorphemic ditransitive verbs like *ge* “give,” though marginally acceptable for some speakers (Holmberg and Platzack 1995, 219).

- (23) ??/\*Bok-en gav-s mig.  
 Book-the gave-PASS me  
 “The book was given me.”

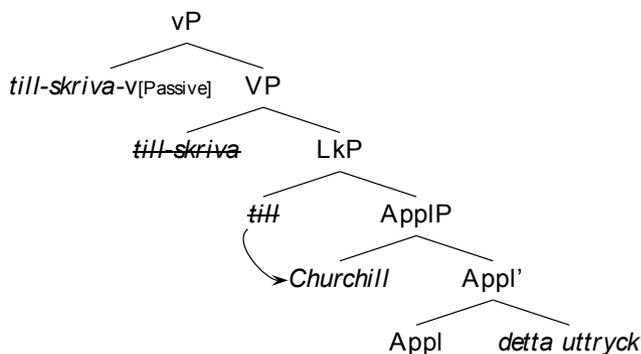
Holmberg and Platzack (1995, 219–20) report that theme passives improve with bimorphemic verbs like *till-dela* “award” (lit. to-share), *till-skriva* “ascribe” (lit. to-write), and *för-ära* “award” (lit. for honor).

- (24) Detta uttryck brukar till-skriva-s Churchill.  
 This expression is.usually to-write-PASS Churchill  
 “This expression is usually ascribed to Churchill.”

- (25) Varning-en till-delade-s honom för sent.  
 warning-the to-give-PASS him too late  
 “The warning was sent to him too late.”

We propose that Swedish has a prepositional linker head only as an accompaniment of certain verbs, that is, that the morphemes *till* and *för* in the above examples are merged as linker heads that later adjoin to their selecting verbs. The fact that theme passives are best with this class of bimorphemic verbs therefore suggests some morphological evidence for the linker morpheme proposal in Sections 2 and 3. We illustrate this proposal in (26), which corresponds to the lower portion of (24).

- (26) Theme passives with bi-morphemic verbs in Swedish



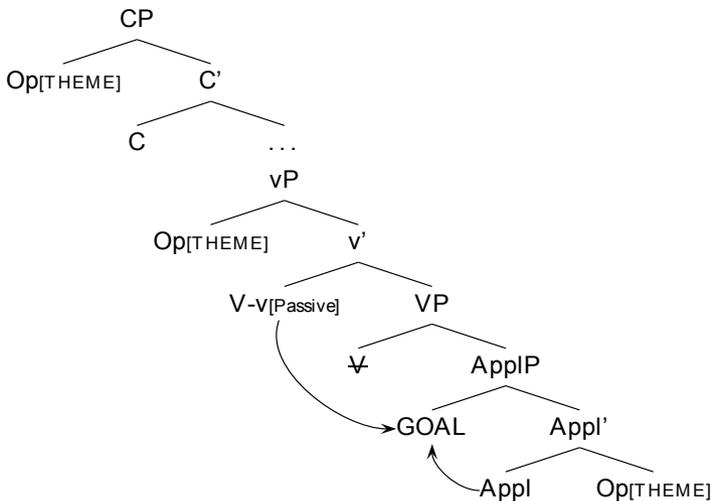
In addition, we note that with non-bimorphemic ditransitive verbs like *ge* “give,” theme passives are better in relative clauses with a relativized theme than in non-relatives (like [23]).

- (27) Jag är så tacksam över allt som givit-s mej.  
 I am so grateful for all that give-pass me  
 “I’m so grateful for all that has been given me.”

The contrast between relative and non-relative contexts suggests that A-bar movement is crucial to the availability of theme-passivization. We propose that in non-relative ditransitive passives, *v* probes the theme and its EPP feature will attract the theme if and only if the goal argument is assigned case by the linker morpheme. In the object relative case, theme movement is not triggered by the EPP feature on *v*. Rather, the theme moves to the edge of *vP* because it is a silent operator. From this position, it can later raise to CP.

Something more, though, needs to be said to account for case on the goal in cases like (27). If, as we have proposed, applicative constructions with *give*-class verbs do not have a linker in Swedish, then some other source of case on the goal argument is needed. We suggest that the fact that *v* is not involved in the licensing of the theme means that it can probe the goal and together with *Appl* assign the “extra case” to it. In Danish, theme passives are unacceptable even in theme relatives, as might be expected given that Danish is a strictly asymmetric passive language. We suggest that the difference between Swedish and Danish is that the *v*-*Appl* combination is incapable of assigning case to the goal in Danish even in theme relatives.

- (28) Relative operator movement to spec, *vP*



Swedish relative clauses, therefore, suggest a fourth way of circumventing locality in raising a theme argument past a goal in applicative constructions. Here, the theme can raise past the goal to the edge of vP because it is a silent operator.

## 5. Conclusions

This paper has focused on cross-speaker and cross-dialectal variation in object symmetry effects—the availability of locality obviating theme movement out of applicative constructions—in English, Swedish, and Norwegian. We have argued that object symmetry is not a unified phenomenon, but rather that there are several different ways that locality can be circumvented. We have proposed that neither of the two principal models of objects symmetry effects—the case approach and the locality approach—are exclusively correct, but rather that both are needed to model the relevant facts across Germanic varieties.

A second goal of this paper has been to describe a shape conservation effect in OS contexts not previously reported in the literature. Judgment experiment results show that theme-goal orders in Norwegian OS contexts are available for just those speakers who also accept theme-goal orders in active non-OS contexts. This can be understood if theme-goal orders in OS are fed by short theme movement vP-internally. This object ordering constraint applies in the same environment that another, much better described ordering constraint applies, namely Holmberg's Generalization effects. We have shown that these results are explained by Fox and Pesetsky's (2005) cyclic linearization proposal without further assumptions.

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# Default Case in Dutch: A Comparative Study of Dutch and English Case Systems

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**Abstract:** The main goal of this paper is to compare pronominal case in English and Dutch in different syntactic environments to determine what the default case in Dutch is. The default case is defined as the unmarked case which spells out nominal expressions when no syntactic mechanisms are at play. It shows that relatively few environments are truly informative for Dutch, since in most constructions it uses case features assigned in syntax rather than the default case. In those constructions where the default case appears, it is the NOM that is used. The results, however, become more robust when compared with another language, English, where the default case is ACC.

**Keywords:** default case; pronominal case; Dutch pronouns; English pronouns; prescriptive grammar.

## 1. Introduction

This paper compares the pronominal case systems of two historically related languages—English and Dutch—and focuses on their default cases. Although they are both poor case Germanic languages (just like Danish, Swedish, and Afrikaans as other examples) with morphologically distinct case forms visible only on personal pronouns and not on other elements within the Noun Phrase (as is the case in, e.g., German, Icelandic, or Faroese), they have different rules governing their default case marking. According to previous studies (Schütze 2001; Weerman 2003; Sigurðsson 2006; etc.), English has accusative case (ACC) as the default form while Dutch has nominative case (NOM) as the default form. I will look at different environments in which the default case occurs and try to determine whether this hypothesis can be confirmed and whether there is any inter- or intra-speaker variation.

The paper is divided into four sections. The second section will provide an overview of the historical development of the case system in Dutch. The third section will focus on different constructions such as coordinate Determiner Phrases, modified pronouns and predicate nominals (as well as other syntactic structures) and compare English with Dutch to determine what the default case in each language is. Finally, the fourth section will try to outline the trends and tendencies and make some predictions about the future development of the Dutch pronominal case system.

## 2. Historical Perspective

In this section I will look at the old case systems in Dutch and English, and I will first review how they have changed throughout history and discuss which events and approaches have influenced the changes in Dutch. Like many other Indo-European languages Dutch has moved from being a synthetic language to being mainly an analytic language in which word order and prepositions play a decisive role in determining grammatical relations. Although in the Middle Ages it was a rich case language with determiners, adjectives, nouns, and pronouns declined for case, case inflection has mostly disappeared<sup>1</sup> and has remained visible only on determiners and nouns in certain fixed expressions.

Middle Dutch (1170–1500) had a productive case system and distinguished four cases, namely NOM, GEN, DAT, and ACC which were commonly used in both written and spoken language. Even though in early Modern Dutch (1500–1600) the case system gradually started falling out of use, the grammarians of the 16th to 18th centuries like Hendrik Laurenszoon Spieghel, Christiaen van Heule, and David van Hoogstraten attempted to standardize the language and believed that Dutch should not be modelled according to the speech of common people but according to “more perfect” classical languages with rich inflectional systems like Latin or Greek. In their effort to “create” a rich and regular language they for instance artificially made the distinction for the use of the two already existing forms of the definite article, *de* and *den*, which had previously depended purely on phonological rules. The two forms were given grammatical functions, so that *de* would be used with subjects but *den* with objects. In the same way they introduced into the language the distinction between the ACC case of the third person plural pronoun *hen* and its DAT case form *hun* which is still used even now, although the two forms seem to be merging again (for more detail see Section 4). The prescriptive grammarians also looked back to old Dutch manuscripts and dialects to find counterparts of the six Latin cases and added cases such as the ablative (ABL) and the locative (LOC), although northern Dutch dialects had no distinction for the NOM

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<sup>1</sup> With the exception of pronouns and the genitive case expressing possession as in *Jans auto* “John’s car.”

and ACC case forms any more.<sup>2</sup> This artificial approach to grammar was most prevalent throughout the 17th and 18th centuries.

However, by the 18th century the spoken language had lost its case system in most dialects and it remained present only in the written standard. The discrepancy between the spoken form and the written norm finally led the Minister of Education Hendrik Pieter Marchant to introduce a school reform in 1934 so that the case endings were not taught at schools any longer, and consequent spelling reforms in 1946–47 abolished written norms for the use of case in both Belgium and the Netherlands.

The nouns of present day Dutch took over either the original NOM case form (northern Dutch) with masculine and feminine gender merged, or the ACC case form (southern Dutch and Flemish) with masculine and feminine gender distinctions. Nevertheless, the remnants of the old system are still fossilized in a number of fixed expressions, most of which belong to standard usage, though examples (1d) and (1e) are considered archaic.

(1) The old genitive case

(a) 's werelds loop  
 the<sub>GEN</sub> world<sub>GEN</sub> course  
 “the world’s course”

(b) de tand des Tijds  
 the tooth the<sub>GEN</sub> time<sub>GEN</sub>  
 “the test of time”

(c) het pad des levens (archaic)  
 the path the<sub>GEN</sub> life<sub>GEN</sub>  
 “the path of life”

(d) de zegen des allerhoogsten (archaic)  
 the blessing the<sub>GEN</sub> highest<sub>GEN</sub>  
 “blessing of the most high (God)”

2 The same approach was taken towards gender. Hendrik Laurenszoon Spieghel for instance advocated that a language was “rich enough” if words could be changed in many different ways, which meant that nouns should have visible case endings and gender distinctions between masculine, feminine, and neuter (de Vries 1994, 72). This opinion was adopted by other grammarians as well and led to the long gender lists of the 18th and 19th centuries which had to be learnt by heart by schoolchildren.

- (2) The old dative case
- (a) in den Beginner  
 in the<sub>DAT</sub> beginning<sub>DAT</sub>  
 “at the beginning”
- (b) in koelen Bloede  
 in cold<sub>DAT</sub> blood<sub>DAT</sub>  
 “in cold blood”

However, these morphemes are no longer productive in other (not fixed) expressions. Compare (1d) with (3a) and (2b) with (3b):

- (3) (a) \*de zegen des Gods  
 the blessing the<sub>GEN</sub> God<sub>GEN</sub>  
 “God’s blessing”
- (b) \*in rode Bloede  
 in red<sub>DAT</sub> blood<sub>DAT</sub>  
 “in red blood”

In comparison to Dutch, the rapid loss of case inflection started somewhat earlier in English. Although the reduction of case system was already observed in Old English (449–1100), the case system was reduced, and essentially disappeared, for all nouns in the Early Middle English period (1100–1250). Some studies suggest that the change might possibly have been hastened due to the influence of Scandinavian languages and French (Allen 1997, 87).

### 3. Default Case in Dutch

Despite the loss of case inflection on nouns, modern Dutch pronouns have retained some case distinctions, which can show what the default case of the Dutch language is. For present day pronouns, see Table 1 for their stressed, full forms and unstressed, reduced forms (in parentheses). Generally speaking, if the emphasis lies on the pronoun, the full form is used. However, reduced forms occur more frequently than their full equivalents and are used if the stress moves from the pronoun onto the verb.

| Person        | NOM                               | GEN                                    | DAT                                    | ACC                                    |
|---------------|-----------------------------------|--|--|--|
| <b>1st sg</b> | ik ('k)                           | mijn (m'n, me)                         | mij (me)                               | mij (me)                               |
| <b>2nd sg</b> | jij (je), u, gij (ge)             | jouw (je), uw                          | jou (je), u                            | jou (je), u                            |
| <b>3rd sg</b> | hij (ie, die), zij (ze), (het,'t) | zijn (z'n), haar ('r, d'r), zijn (z'n) | hem ('m), haar ('r, d'r, ze), (het,'t) | hem ('m), haar ('r, d'r, ze), (het,'t) |
| <b>1st pl</b> | wij (we)                          | ons                                    | ons                                    | ons                                    |
| <b>2nd pl</b> | jullie (je), u, gij (ge)          | jullie (je), uw                        | jullie (je), u                         | jullie (je), u                         |
| <b>3rd pl</b> | zij (ze)                          | hun                                    | hun                                    | hen (ze)                               |

**Table 1:** Present Day Dutch Pronouns.

I will now look at different syntactic structures to determine what the default case in Dutch is, that is to say, what appears to be the unmarked, elsewhere rule for the use of case in this language. Schütze (2001, 206) analyzes the default case as follows: “The default case forms of a language are those that are used to spell out nominal expressions (e.g., DPs) that are not associated with any case feature assigned or elsewhere determined by syntactic mechanisms.” I will focus on different environments and compare the English sentences with their Dutch counterparts.

First of all, let's examine coordinate Determiner Phrases in subject and object positions. As can be seen, except for the first person singular pronoun as in *you and I* under the influence of prescriptivism (Emonds 1986; Parrott 2012) English uses the ACC in subject positions even though there is no ACC case assigner; ACC thus must be assigned by default. On the other hand, the only possibility for Dutch in the same environments is to use the NOM which is assigned to subject coordinate Determiner Phrases by a syntactic mechanism; ACC would be ruled out completely. By contrast, the verb assigns ACC case to Determiner Phrases in object positions in both languages (4c).

- (4) (a) Them and us/\*They and we are going to the library. (ACC)  
 Zij en wij/\*Hen en ons gaan naar de bibliotheek. (NOM)
- (b) Did his friends or him/\*he send the email? (ACC)  
 Hebben zijn vrienden of hij/\*hem de email gestuurd? (NOM)
- (c) Did John call her or us/\*she or we? (ACC)  
 Heb Jan haar of ons/\*zij of wij opgebeld? (ACC)

A second construction which should be paid attention to are the so-called subjects of understood predicates in comparatives (Emonds 1986, 96). We find ACC default case again in English, but Dutch grammars (Haeseryn et al. 1997, 249) prescribe NOM because the pronoun after *als* (*as, like*) and *dan* (*than*) could become the subject of its full clause counterpart as in (5a<sup>7</sup>). Nonetheless, since people treat *als* and *dan* like prepositions ACC can also appear in spoken Dutch (indicated by %). Objects of understood predicates will get ACC case marking from the verb in both Dutch and English (5d).

- (5) (a) No one is as good as us/\*we. (ACC)  
 Niemand is zo goed als wij/%ons. (NOM)
- (b) No one has paid more money than me/\*I. (ACC)  
 Niemand heeft meer geld betaald dan ik/%me. (NOM)
- (c) I met a man who dances like me/\*I. (ACC)  
 Ik ontmoette een man die danst als ik/%me. (NOM)
- (d) I understand him better than her/\*she. (ACC)  
 Ik begrijp hem beter dan haar/\*zij. (ACC)

Compare:

- (a') No one is as good as we/\*us are. (NOM)  
 Niemand is zo goed als wij/\*ons zijn. (NOM)

Thirdly, default case appears in both languages in modified pronouns. In subject positions in English, where we would normally expect NOM, the modified pronoun gets ACC by default, while in Dutch modified pronouns in both subject (6a) but more importantly in object positions (6b) will be in NOM. Since verbs do not assign NOM to their objects, NOM must be the default case here. This construction thus appears to be the most informative for the Dutch language.

- (6) (a) The real me/\*I is finally emerging. (ACC)  
 De echte ik/\*me komt eindelijk boven. (NOM)
- (b) Nobody knew the real me/\*I. (ACC)  
 Niemand kende de echte ik/\*me. (NOM)
- (c) Poor her/\*she. (ACC)  
 Arme zij/\*haar. (NOM)

Predicate nominals or postverbal DPs are another default case environment in English. In the examples below we find ACC again in English but NOM in Dutch. However, the pronouns in Dutch seem to follow case features rather than the default case because they actually agree with the verb and in fact are in subject position, with any preceding material resulting from fronting, as is typical of V2 languages.

The only exceptions are third person singular pronouns where Dutch allows ACC case marking if the pronoun is in its reduced form so that the main stress of the sentence moves from the pronoun onto the verb (7d). One more special case concerns conditional sentences where ACC is apparently the one and only option in both languages (7e), so that Dutch seems to be developing in the “English direction” here (Sigurðsson 2006, 17).

- (7) (a) It is us/\*we. (ACC)  
Dat zijn wij/\*ons. (NOM)
- (b) And there is me/\*I in the picture. (ACC)  
En daar ben ik/\*me in de foto. (NOM)
- (c) The man with the red hat is me/\*I. (ACC)  
De man met de rode hoed ben ik/\*me. (NOM)
- (d) (Is that the baker?) Yes, that is him/\*he. (ACC)  
(Is dat de bakker?) Ja, dat IS 'm/\*hij. (ACC)
- (e) If I was him/\*he, . . . (ACC)  
Als ik hem/\*hij was, . . . (ACC)

Other constructions in which there are no obvious case assigners for subject DPs in English are unembedded small clauses, left-dislocation, and appositive pronouns. The pronouns in these environments show the same pattern as we have seen so far, which means that pronoun subjects would take ACC default case in English. On the other hand, pronouns in unembedded small clauses in Dutch take NOM, even though the non-finite verb cannot assign case to its subject. Similarly, appositive pronouns in both subject and object position will get NOM in Dutch by default. However, left dislocation is problematic in Dutch because pronouns cannot be the sole left dislocated element.

- (8) (a) Me/\*I, buy a book? (Come on!) (ACC)  
Ik/\*Me, een boek kopen? (Kom nou!) (NOM)

- (b) The chairman, her/\*she, will not accept this. (ACC)  
De voorzitter, zij/\*haar, zal dat niet accepteren. (NOM)
- (c) It was for us, John and me/\*I, too late. (ACC)  
Het was voor ons, Jan en ik/\*me, te laat. (NOM)
- (d) Him/\*He, I hate that he is always late. (ACC)  
\*Hem/\*Hij, ik haat het dat hij altijd te laat is. (?)

Moreover, in elliptical utterances pronouns also get ACC default case in English even if the pronoun has the grammatical function of subject, but they will become NOM if the finite verb is not omitted (9a'). On the other hand, pronouns in Dutch follow syntactically assigned case features in these environments; they are assigned case according to the sentence function to which they refer.

- (9) Who wants a piece of cake?  
Wie wil een stuk taart?
  - (a) Me/\*I. (ACC)  
Ik/\*Me. (NOM)
  - (b) Just me/\*I. (ACC)  
Alleen ik/\*me. (NOM)
  - (c) Me/\*I too. (ACC)  
Ik/\*Me ook. (NOM)
  - (d) Not me/\*I. (ACC)  
Ik/\*Me niet. (NOM)

Compare:

- (a') I/\*Me do. (NOM)  
Ik/\*Me niet. (NOM)

- (10) Who did the man kill?  
Wie heeft de man vermoord?
  - Him/\*He. (ACC)
  - Hem/\*Hij. (ACC)

Finally, default case occurs in English in gapping as a type of ellipsis. Even here English requires ACC for the subject pronouns in the second clause, while object pronouns will get ACC from the gapped verb. Dutch follows syntactic case features again and assigns case according to the pronoun's sentence function.

- (11) (a) He ate bread and us/\*we rice. (ACC)  
 Hij at brood en wij/\*ons rijst. (NOM)
- (b) Everybody ordered dessert, except him/\*he a coffee. (ACC)  
 Iedereen bestelde een toetje, behalve hij/\*hem een koffie. (NOM)
- (c) Mary missed John and him her/\*she too. (ACC)  
 Marie misde Jan en hij haar/\*zij ook. (ACC)

As has been shown in the preceding example sentences, English and Dutch differ substantially in their default case marking. When case is not assigned by a syntactic mechanism, English uses ACC as the default case as has been suggested by previous studies. On the other hand, standard Dutch uses syntactic case features in most environments, which means that case is assigned according to the sentence function in which the pronoun appears. Nonetheless, NOM default case is visible in relatively few environments, namely as modified pronouns, in unembedded small clauses and appositive pronouns, although there are some special cases that need to be paid attention to as well.

As it was previously pointed out (Schütze 2001, 229), in rich case languages the default case is always NOM, whereas in poor case languages it can be either ACC (as in English) or NOM (as in Dutch). Possibly English and Dutch have developed in different ways because historically they have been influenced by different languages—English by Danish (Emonds and Faarlund, forthcoming) and Dutch by German and Latin as was discussed in the first section.<sup>3</sup>

#### 4. Trends, Tendencies, and Predictions for Future Development

In the last section I will look at the development tendencies and recent changes in the Dutch pronominal case system and make some predictions for future development.

The most apparent ongoing change in the Dutch case system is towards the loss of distinction between the third person plural pronoun forms for the ACC case *hen* and the DAT case *hun*. It has been observed that the rules for their usage are

<sup>3</sup> Note that Danish also has ACC as the default case (Schütze 2001; Sigurðsson 2006) while German and Latin have NOM.

quite complicated—*hen* is used for direct object (12a), while *hun* is used for indirect object (12b), and after prepositions *hen* always appears (12c). Compare the examples below:

- (12) (a) We verwachten hen.  
 we expect them<sub>ACC</sub>  
 “We are expecting them.”
- (b) Ze vroeg hun of ze ook wilden komen.  
 she asked them<sub>DAT</sub> if they also wanted come  
 “She asked them if they wanted to come as well.”
- (c) Ze vroeg aan hen of ze ook wilden komen.  
 she asked to them<sub>ACC</sub> if they also wanted come  
 “She asked them if they wanted to come as well.”

Furthermore, when the pronoun is not stressed the reduced form *ze*, which has the same form for both subject and object positions, is used:

- (13) (a) We verwachten ze.  
 we expect them<sub>NOM/ACC</sub>  
 “We are expecting them.”
- (b) Ze vroeg ze of ze ook wilden komen.  
 she asked them<sub>NOM/ACC</sub> if they also wanted come  
 “She asked them if they wanted to come as well.”
- (c) Ze vroeg aan ze of ze ook wilden komen.  
 she asked to them<sub>NOM/ACC</sub> if they also wanted come  
 “She asked them if they wanted to come as well.”

Many speakers already interchange the ACC and DAT forms, and this predictably causes foreigners a lot of problems. It has been noticed that the two forms are merging again. Interestingly, Weerman (2003, 1) points out the fact that the DAT form *hun*<sup>4</sup> is spreading even to subject positions in present day spoken Dutch, as in the following example (14b):

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4 *Hun* is also the GEN form of the pronoun, and therefore it appears more frequently in the language than the competing *hen*.

- (14) (a) Zij hebben het gedaan.  
 they<sub>NOM</sub> have it done  
 “They have done it.”
- (b) Hun hebben het gedaan.  
 they<sub>DAT</sub> have it done  
 “They have done it.”

However, this change has been accompanied by a strong debate whether grammarians should try and stop the “decline of Dutch” or not, as this change is spreading from non-standard to standard Dutch and has stirred some hostile reactions especially among the middle and upper classes. Despite that, it is not likely that any linguistic debate can really stop the changes already happening in the spoken language itself.

## 5. Conclusion

In this paper I have discussed some of the changes and tendencies in the development of the Dutch pronominal case system. In the first section I compared the case systems of Old and Modern Dutch and showed how the prescriptive approach of the 16th to 18th century grammarians fossilized the case system for a certain period of time and resulted in a discrepancy between the written standard and the spoken form. This was finally resolved through the spelling reforms of 1946–1947 that abolished written norms for the use of case in Belgium and the Netherlands respectively and brought the spoken and the written form closer together again.

In the empirical part of the paper the hypothesis that the ACC is the default case form for English, while NOM is the default case form for Dutch was confirmed, but it appears that most constructions in Dutch follow the case features not the default case, and that relatively few environments are truly informative for resolving this question.

In the final section I examined some of the most recent changes in the case system in Dutch and showed that the DAT case form of the third person plural is gradually spreading to subject positions as well. This change is another example of language change that started in the spoken (non-standard) language and is gradually spreading to standard language.

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# The Semantics of Adnominal Pronouns and Unagreement

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**Abstract:** This paper suggests that adnominal pronoun constructions (*we linguists* and its analogues in other languages) and unagreement share a common core meaning. Person features in the extended nominal projection introduce presuppositions about the membership of speech-act participants in the denotation of the DP. This is argued to be empirically more adequate than a suggestion in the literature that the meaning of unagreement would be fundamentally different from that of adnominal pronoun/pronominal determiner constructions. The claim that the nominal part of an adnominal pronoun construction establishes its basic denotation also distinguishes the present analysis from alternative views according to which adnominal pronoun constructions involve a relationship between one set denoted by the pronominal and the nominal part.

**Keywords:** semantics; person; unagreement; pronominal determiners; presupposition.

## 1. Introduction

Expressions like *we linguists*—I will refer to them as adnominal pronoun constructions (APCs) in what follows—have played a role in modern syntactic theory at least since Postal's (1969) influential proposal that the “so-called pronoun” in these constructions is actually an article. This idea was further developed by Abney (1987) into pronominal determiner analysis (as opposed to an analysis in terms of apposition), which has since been taken up by a series of authors (cf. among others Lawrenz 1993; Lyons 1999; Dechaine and Wiltschko 2002; Panagiotidis 2002, 2003; Rauh 2003, 2004; Elbourne 2005; Roehrs 2005).

The phenomenon of unagreement involves an unexpected first or second person plural marking on a verb, typically in correspondence with a definite plural subject (1)

and (2). Although I will leave those cases aside here, unagreement can also be observed with certain quantifiers as in (3).

- (1) Nai oi gynaikes eiste poly dynates.  
 yes DET.NOM.PL women are.2PL very strong.PL  
 “Yes, you women are very strong.” [Modern Greek]<sup>1</sup>
- (2) En particular, los alemanes no deberíamos pensar  
 in particular DET.PL Germans NEG must.COND.1PL think.INF  
 que nosotros siempre sabemos más.  
 that we always know.1PL more  
 “We Germans in particular should not think that we always know better.”<sup>2</sup> [Spanish]
- (3) Poll-es gynaikes exoume perasei sta xronia  
 many-NOM.PL women have.1PL passed in.DET.ACC.PL years  
 tis efiveias asxim-es meres logo tis  
 DET.GEN.SG youth bad-ACC.PL days because.of DET.GEN.SG  
 akmis.  
 acne  
 “Many of us women have suffered bad days in the years of our youth because of acne.”<sup>3</sup> [Modern Greek]

Unagreement is attested in several null subject languages, such as Modern Greek, Spanish, Catalan, Galician and Bulgarian. It is lacking in others, such as Standard Italian and European Portuguese. There is a variety of approaches to the syntactic analysis of the phenomenon (Bosque and Moreno 1984; Hurtado 1985; Taraldsen 1995; Torrego 1996; Ordóñez and Trevino 1999; Ordóñez 2000; Saab 2007; Rivero 2008; Rodrigues 2008; Villa-Garcia 2010; Ackema and Neeleman 2013; Choi 2013; Höhn forthcoming).

The present paper proposes a unified interpretation of person features in APCs and unagreeing nominal phrases, set within the general framework of Heim and Kratzer (1998). For reasons of space, I will restrict my attention to languages with unagreement here. Following Höhn (forthcoming), both APCs and unagreeing nominal phrases are

1 See <http://www.protothema.gr/life-style/Gossip/article/380049/> giorgos-liagas-ena-megalou-euharisto-se-oles-tis-gunaiques-gia-oti-mas-prosferete-s-auti-ti-zoi/, accessed 30 May 2014. In the interest of readability, I will gloss case and number only on their first exponent in the noun phrase, except where it is crucial for the point to be made. I will not gloss gender.

2 Europarl corpus via <http://en.bab.la/dictionary/spanish-english/nosotros-sabemos>, accessed 7 May 2014.

3 See <http://kerkyrain.gr/index.php/woman/omorfia-gunaka>, accessed 30 May 2014.

assumed to share the same basic structure. Building on a presuppositional analysis of person features (Heim 2008), I argue that the denotation of the nominal phrase in both constructions is determined by the nominal element (and potential adjectival modifiers). The person features simply introduce a presupposition as to the membership of a speech act participant in the denoted set, rather than being indicative of a set relation between a “we” or “you” group and a set introduced by the descriptive noun phrase (and possible adjectives). This holds independently of whether they are expressed overtly, as pronominals in APCs, or not, as in unagreement.

The paper is structured as follows. The next section will briefly summarize the morphosyntactic analysis of unagreement assumed here. The analysis of the semantics of person features suggested by Heim (2008) and its application to APCs will be presented in Section 3. The extension of this analysis to unagreement and a problem with a different analysis present in the literature will be discussed in Section 4. Section 5 concludes.

## 2. The Structure of Unagreement

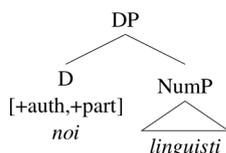
This section provides a brief sketch of the structural analysis proposed for unagreeing DPs in languages such as Modern Greek and Spanish by Höhn (forthcoming). For details, the reader is referred there.

Höhn (forthcoming) suggests that the cross-linguistic variation in the availability of unagreement is due to structural variation in the location of person features in the extended nominal projection. Null subject languages such as Standard Italian allow no definite article in addition to the pronominal part of APCs, cf. (4), which is taken to indicate that they encode person features on D in accordance with pronominal determiner analyses of APCs (Postal 1969; Abney 1987, etc., see above), as illustrated in (5). This encoding of person and definiteness features on the same head is argued to be responsible for the absence of unagreement because person depends on the same head as the definiteness feature, which needs to be spelled out overtly in the presence of an overt nominal. Consequently, the head is necessarily spelled out by the pronominal determiner.<sup>4</sup>

4 A question raised by a reviewer about the lack of unagreement in Czech in spite of the availability of pro-drop extends to most other Slavic languages. As far as I am aware, the exceptions that show patterns analogous to (6) and seem to allow unagreement as expected either have definite articles (e.g., Bulgarian, Pomak) or are in the process of developing them (Slovenian). The simplest account for the lack of unagreement in the remainder of the Slavonic languages would tie it to their lack of definite articles, blocking them from acquiring a structure like (7). Note, however, that while it may be true for Indo-European languages that overt definite articles are a necessary condition for unagreement, this cannot be the whole story, considering that languages such as Georgian and Swahili seem to show unagreement in spite of a lack of definite articles.

- (4) noi (\*i) linguist-i  
 we DET.PL linguist-PL  
 “we linguists” [Standard Italian]

(5)

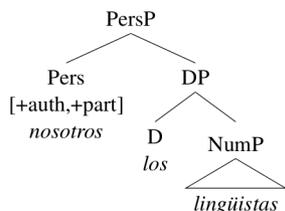


In languages with unagreement, on the other hand, such as Modern Greek or Spanish, APCs require an overt definite article in addition to the pronominal, cf. (6). Höhn argues that in these languages person features are located on a higher functional head distinct from the one hosting definiteness, as illustrated in (7).

- (6) (a) nosotros \*(los) lingüista-s  
 we DET.PL linguist-PL  
 “we linguists” [Spanish]

- (b) emeis \*(oi) glossolog-oi  
 we DET.NOM.PL linguist-NOM.PL  
 “we linguists” [Modern Greek]

(7)



This structure makes the spell-out of the person features independent of that of the definiteness features; in particular, they can be silent, while definiteness is overtly realized as required. The person features of unagreeing subjects give rise to verbal agreement as expected, but they are able to refrain from spelling out the head hosting person features overtly, presumably as a result of the same process that is responsible for pro-drop in general.

### 3. The Semantics of Person and APCs

There is a tradition that suggests that  $\phi$ -features on pronominals introduce a presupposition about the denotation of the element they are associated with (Cooper 1983; Schlenker 2003; Heim 2008). This can be formalized by means of partial functions as in (8), quoted from Heim (2008, 37). The symbol  $hc$  denotes the addressee in the discourse context  $c$  (the hearer in spoken language),  $sc$  the author (the speaker in spoken language).

- (8) (a)  $[[\mathbf{1st}]]^c = \lambda x_c : x$  includes  $s_c.x$   
 (b)  $[[\mathbf{2nd}]]^c = \lambda x_c : x$  includes  $h_c$  and excludes  $s_c.x$   
 (c)  $[[\mathbf{3rd}]]^c = \lambda x_c : x$  excludes  $s_c$  and  $h_c.x$

These functions are only defined under the condition that the entity  $x$  fulfills the condition imposed on it. Hence, functional application of a head containing a set of person features to a semantic object of the appropriate type  $\langle e \rangle$ , an entity, effectively imposes the accommodation of the respective conditions on the denotation of the entity. Otherwise, the function would be undefined and the utterance that contains it infelicitous.

For simplicity of exposition, I follow Heim in using atomic person features here. The relevant facts hold independently of the issue of the morphosyntactic nature of person features as either involving a set of binary features (Nevens 2007; 2011) or as unary features organized in a feature geometry (Harley and Ritter 2002). The discussion will be restricted to first and second person, ignoring the distinction between inclusive and exclusive first person plurals, which is irrelevant to the languages discussed.

For illustration, consider the simplified structure in (9) for the Greek phrase in (6b). The denotation assumed for the DP is given in (10). Following the proposal adopted in the previous section, functional application of the first person features to the DP is only defined if the speaker is included in the denotation of the DP, yielding a denotation like (11) for the complete PersP.

- (9)  $[_{\text{PersP}} \text{emeis } [_{\text{DP}} \text{oi glossologoi } ] ]$   
 (10)  $[[ [_{\text{DP}} \text{oi glossologoi } ] ]]^c =$  The unique set  $L$  of linguists salient in  $c$ .  
 (11)  $[[ (9) ]]^c = [\lambda x_c : x$  includes  $s_c.x$ ] (the unique set  $L$  of linguists salient in  $c$ )  
 $=$  The unique set  $L$  of linguists salient in  $c$  iff  $s_c \in L$ , undefined otherwise.

In the remainder of this section I am going to present evidence in favor of the view that the person features do indeed introduce a presupposition. For ease of exposition, I will use the presuppositions typically assumed to be introduced by focus-sensitive particles for comparison

and focus on English pronominal determiner constructions in this section. The relevant data for an unagreement language such as Greek will be discussed in the next section.

Consider the sentence in (12) involving the focus-sensitive particle *also*. The meaning of the sentence can be split into an assertion (12a) and a presupposition (12b). The latter is a felicity condition that is met if and only if the sentence is uttered in a situation compatible with the proposition expressed in the presupposition. Simply put, uttering (12) is not felicitous if the addressee of the utterance did not meet anybody at the relevant party (for example because she did not attend it at all).

(12) You also met [<sub>F</sub> John] at the party.

(a) Assertion: You met John at the party.

(b) Presupposition: You met somebody other than John at the party.

Importantly, sentential negation only affects the asserted proposition (13a), while the presupposition remains unchanged (13b). The sentence can still only be felicitously uttered if the addressee met somebody other than John at the relevant party.

(13) It is not the case that you also met [<sub>F</sub> John] at party.

(a) Assertion: You didn't meet John at the party.

(b) Presupposition: You met somebody other than John at the party.

Assuming that APCs involve a presupposition as suggested above, the meaning of (14) can be split into an assertion and a presupposition as illustrated. As expected if (14b) is actually a presupposition, it remains constant under negation, as seen in (15b).

(14) We linguists are silly.

(a) Assertion: The linguists are silly. *or* Linguists are silly.<sup>5</sup>

(b) Presupposition: I am a linguist.

(15) It is not the case that we linguists are silly.

(a) Assertion: The linguists are not silly. *or* Linguists are not silly.

(b) Presupposition: I am a linguist.

<sup>5</sup> The sentence seems to allow for an ordinary definite specific reading and a generic/kind reading. This is tangential to the issue of the presupposition, which is present in either case and could be characterized more precisely as “ $s_c$  is a member of the set L of linguists,” where L could either be a specific, contextually specified set or the generic set of all linguists for the kind reading.

A further, related diagnostic for presuppositions is the wait-a-minute test (Shanon 1976; cf. also Matthewson 2004, 402 attributing it to Kai von Stechow p.c.). The presupposition of the sentence uttered by A in (16) cannot be rejected as readily as the assertion, a negative reply to the assertion cannot target the presupposition, cf. (16b), probably because the presupposition is constant under negation. In order to cancel the presupposition, some more elaborate device is necessary, for example, an expression such as *wait a minute* (16c).

(16) A: I also met [<sub>F</sub> John] at the party.

B: No.

(a) *assertion denied*:

You didn't meet John.

(b) *presupposition not cancelable*:

% You didn't meet anyone at the party.

(c) *challenging the presupposition*:

Wait a minute, you didn't meet anyone at the party, you just sat in your corner!

The pattern for APCs is comparable, as shown in (17). Note that it does not matter for (17b) and (17c) whether *linguist* is singular or plural, i.e., whether the status of being a linguist is challenged for one or more people. The relevant issue is that it is challenged for the person uttering the initial sentence.

(17) We linguists have a lot to say.

(a) No, you don't. [assertion denied]

(b) # No, you are no linguist(s). [presupposition not cancelable]

(c) Wait a minute, I don't think you're a linguist/linguists!  
[presupposition challenged]

Finally, the filter properties of certain constructions described by Karttunen (1973) provide a further useful tool to diagnose presuppositions. Conditionals, for example, generally project focus. A presupposition in the consequent of a conditional will remain intact (almost) independently of the value of its antecedent. However, if the proposition expressed by the presupposition is actually entailed by the antecedent, the presupposition does not project, i.e., it does not hold for the sentence. This is illustrated in example (18). The verb *stopped* in (18a) triggers the presupposition that Fred used to drink alcohol previously. This

presupposition remains intact even if the presupposition is embedded in the consequent of a conditional as in (18b). However, if the antecedent entails the presupposition of the consequent, namely that Fred used to drink alcohol, the presupposition does not project to the full sentence. Hence, (18c) does not presuppose that Fred used to drink alcohol.

- (18) (a) Fred has stopped drinking alcohol.
- (b) If he didn't come to the bar last night, Fred has stopped drinking alcohol.
- (c) If he used to drink alcohol, Fred has stopped drinking alcohol.

The same behavior can be observed for APCs. For simplicity, I am using second person APCs here. While the presupposition of (19a) that the addressee is an academic is retained for (19b), the (slightly insulting) sentence in (19c) does not presuppose this.

- (19) (a) You academics have a problem.
- (b) If the gossip is true, you academics have a problem.
- (c) If you are an academic, you academics have a problem.

This concludes my discussion of APCs. In the next section, I will argue that the semantics of unagreement structures can be dealt with in the same way.

#### 4. The Semantics of Unagreement

In his discussion of unagreement in Bulgarian, Norman (2001, 83) provides the following characterization of its meaning:

Совокупный грамматический субъект – «мы» – формально здесь выражен флексией глагольного сказуемого, а его лексическая детализация (кто именно «мы»?) происходит при помощи существительного или целой именной группы, занимающей позицию подлежащего.

The joint subject—“we”—is formally expressed here by the inflection of the verbal predicate, while its lexical specification (who exactly are “we”?) is brought about through a noun or a whole nominal phrase which takes the place of the subject. (translation GFKH)

This implies that the overt DP in unagreement configurations delimits the otherwise only contextually defined “we” group. The discussion in this section aims to show

that while Norman's quote is descriptively adequate, there is no need to postulate an independent "we" group referred to in the truth conditions of unagreement sentences. Instead, the DP itself will be argued to denote the plural subject of the predicate in parallel to the treatment suggested for APCs above. The impression of a "we" (or "you") group is a side effect of the presuppositions discussed above. This analysis will be defended against an alternative that assumes two distinct plural entities to be complicit in determining the subject of an unagreement sentence: the "we" group and a proper subset of it, denoted by the overt DP.

As outlined in Section 2, I assume that unagreement has the same syntactic structure as regular APCs, so an unagreeing subject like the Greek *oi glossologoi* "the linguists" might have the structure in (20), identical to the APC structure in (9) above. Consequently, their meaning is also largely the same, as illustrated in (21).

(20) [<sub>Persp</sub> [+auth,+pers] [<sub>DP</sub> *oi glossologoi* ] ]

(21) [[ (20) ]]<sup>c</sup> = [ $\lambda x_c . x$  includes  $s_c . x$ ] (the unique set L of linguists salient in c)  
 = The unique set L of linguists salient in c iff  $s_c \in L$ , undefined otherwise.  
 (= [[ (9) ]]<sup>c</sup>)

Contrary to this analysis, Torrego (1996, n. 12) claims "that Spanish floating definite plurals do not have the appositive reading we linguists has in English." She does not state explicitly what she means by "appositive reading," but her discussion of the example in (22)—adopted from her (6a)—makes things somewhat clearer.

(22) Firmamos los lingüistas la carta.  
 signed.1PL DET.PL linguists DET.SG letter  
 "The linguists among us signed the letter."<sup>6</sup>

Torrego (1996, 114f.) suggests the following characterization:

In [(22)] the *los*-NP is interpreted as a subgroup of individuals included in the reference of the first person plural pronoun "we"—something like "those of us who are linguists signed the letter." In other words, [(22)] implies that at least one of the members of the first person plural pronoun "we" is not a linguist.

6 Notice that in her n. 7 the same sentence with the subject in preverbal position, *los lingüistas firmamos la carta*, receives the translation "we the linguists signed the letter." She does not comment on the (in-)significance of this difference in translation. Her reason for providing the version in (22) is to show that the construction is not restricted to left-peripheral subjects. I will do likewise for the Greek example in (24), although it should be noted that to many speakers VSO orders are slightly odd without context.

Her characterization leaves open the question of the relation of the speaker to the two groups.<sup>7</sup> According to the reading closest to the English translation as *the X among us*, it should be possible for the speaker to only be a member of the “we” group, but not of the X group. An alternative, more restricted reading of her analysis also requires the speaker to be a member of the X group. To illustrate the crucial difference between the two readings of Torrego’s *the X among us* and the *we X* analysis I am advocating here, consider the semi-formal truth conditions of (22) given in (23).

(23)  $[[ (22) ]]^c = 1$  iff

- (a) the salient set of people P in c signed the salient letter in c and there is a salient set of linguists L in c, such that  $L \subset P$ , undefined if  $s_c \notin P$ .  
[the X among us, v.1]
- (b) the salient set of people P in c signed the salient letter in c and there is a salient set of linguists L in c, such that  $L \subset P$ , undefined if  $s_c \notin L$ .  
[the X among us, v.2]
- (c) the salient set of linguists L in c signed the salient letter in c, undefined if  $s_c \notin L$ .  
[we X]

The analysis in (23a) can be rejected as empirically inadequate rather easily. Under this analysis the only restriction on  $s_c$  is that it be in P. But since according to this analysis there are non-linguists who have signed the letter (i.e., L is a proper subset of P), the proposition should be compatible with a situation where the speaker is not a linguist (i.e.,  $s_c \in P$  and  $s_c \notin L$ ). According to my consultants, this is not the case, that is, the speaker needs to be a linguist for (22) to be uttered felicitously, and equivalently for its Greek counterpart in (24). Hence, (23a) can be ruled out on empirical grounds.

(24) Ypograpsame    oi                    glossologoi    to                    gramma.  
signed.1PL        DET.PL.NOM    linguists        DET.ACC.SG    letter  
“We linguists signed the letter.”

The analysis in (23b) requires the speaker to be a linguist, just like the *we X* analysis in (23c). They differ in the way the participants in the event are referred to. In the *we X* variant the subject is introduced as one entity, namely the set L of linguists, while in (23b) the set P denoted by “we” is the agent of the event and a second set L of linguists is introduced as a proper subset of the agent set. Consequently, (23b) is more restrictive than (23c): since  $L \subset P$ , (23b) asserts that there are members of the set of agents that are not linguists.

7 I assume here that her “implies” does not mean “implicates,” but that she is talking about an effect of assertion. In fact, the problems discussed below would not be resolved if this implication was supposed to result from a presupposition.

Notice that while such a situation is compatible with the *we X* approach as well, it is not part of the assertion there. This can be illustrated by reformulating the truth conditions in (23c) to the very similar (25). The weaker condition  $L \subseteq P$  allows for the same situations as (23b) plus those where L and P are identical.

- (25)  $[[ (22) ]]^c = 1$  iff the salient set of people P in c signed the salient letter in c and there is a salient set of linguists L in c, such that  $L \subseteq P$ ,  
undefined if  $s_c \notin L$ . [we X, v. 2]

The difference between (25) and the denotation proposed in (23c) is that using the latter to describe a situation which includes non-linguists as co-signers is pragmatically marked. The only group directly included in the proposition are the linguists; hence, if there are further relevant signers that are not mentioned, the conversational maxim of quantity is violated.

The difference between (23b) and (23c) is not trivial to diagnose empirically, since it hinges on the properties of individuals that are not explicitly mentioned (namely those in the complement set of L in P,  $P \setminus L$ ). However, according to (23b) the speaker of (22) *asserts* that L is a proper subset of P. Therefore, it should be possible to test if the sentence is felicitous in a context where this relation does not hold because  $P \setminus L = \{ \}$  and hence  $P = L$ .

To the extent that this is a legitimate diagnostic, the Spanish and Greek sentences in (26) and (27) contradict the predictions of the *the X among us* analysis. The first part of the Spanish sentence is identical to (22), while the continuation establishes that nobody else signed the letter. The Greek sentence in (27) makes the same point, with the second clause asserting directly that no non-linguist signed the letter.

- (26) Firmamos los lingüistas la carta pero nadie más  
signed.1PL DET.PL.M linguists DET.SG.F letter but nobody else  
la firmó.  
CL.3SG signed.3SG  
“We linguists signed the letter, but nobody else signed it.” [Spanish]

- (27) Ypograpsume oi glosslogogoi to gramma alla  
signed.1PL DET.PL.NOM linguists DET.SG.ACC letter but  
kanenas mi-glosslogos den to ypegrapse.  
no non-linguist NEG CL.SG.ACC.N signed.3SG  
“We linguists signed the letter, but no non-linguist signed it.” [Modern Greek]

Under the analysis in (23b), the sentences in (26) and (27) should be infelicitous because in both of them the second clause contradicts the assertion predicted for the first one.

Since the sentences are felicitous and interpretable for native speakers, the prediction seems to be wrong. I take this to be as an argument against the *the X among us* analysis in (23b). The *we X* analysis of (23c), on the other hand, makes no assertion about non-linguists and therefore correctly predicts no problems in these cases.

The examples in (28) and (29) reinforce this conclusion. The focus-sensitive particle *only*, as well as its Spanish and Greek counterparts, asserts that the proposition expressed by the sentence is false for all alternatives to the focused constituent, the linguists in this case. If the unagreement construction made the contrary assertion that someone who is not a linguist signed the letter, we would again wrongly predict a contradiction. Since both sentences are fine, they present another counterargument to (23b).

- (28) Firmamos solamente los lingüistas la carta.  
 signed.1PL only DET.PL linguists DET.SG letter  
 “Only we linguists signed the letter.” [Spanish]

- (29) Ypograpsame mono oi glossologoi to gramma.  
 signed.1PL only DET.PL.NOM linguists DET.SG.ACC letter  
 “Only we linguists signed the letter.” [Modern Greek]

To conclude, I want to show that the same indications of the presuppositional contribution of person features surveyed above for APCs hold for unagreement constructions as well. The examples are from Modern Greek, but the point made extends to Spanish (and in principle also to unagreement constructions in other languages).

The example in (30) shows that the presupposition introduced in unagreement is constant under negation, paralleling the APC example in (16) above. That is to say, (30) presupposes that the speaker is a student, irrespective of the fact that the clause containing the presupposition is negated.

- (30) Den ischyei oti oi foitites eimaste epimeleis.  
 NEG is.valid.3SG that DET.PL.NOM students are.1PL diligent  
 “It is not the case that we students are diligent.”  
*presupposition*: The speaker is a student.

Similarly, the presupposition of the unagreement construction cannot be denied the same way the assertion can, cf. (31b) vs. (31c). Instead, an analogue of the “wait-a-minute” construction is required to challenge the presupposition, as illustrated in (31d). This is also the effect observed with APCs in (17) above.<sup>8</sup> Just like in that example, the

<sup>8</sup> Notice that the same is true for the Greek APC counterpart of (31a) with a strong pronoun preceding the subject DP, i.e., *emeis oi foitites* “we (the) students.”

infelicity of (31c) does not depend on whether there is one addressee or multiple ones, and conversely (31d) would be equally acceptable with second person plural forms if the studenthood of a group of people is in doubt.

- (31) (a) Oi                    foitites    eimaste    poly    epimeleis.  
 DET.PL.NOM    students    are.1PL    very    diligent  
 “We students are very diligent.”
- (b) Ochi,                tempelint-es                eiste.  
 no                lazybones-PL                are.2PL  
 “No, you are a lazy bunch.” [assertion negated]
- (c) #Ochi,            den        eisai/            eiste            foitit-is/-es.  
 no                NEG        are.2SG        are.2PL        student-SG/PL  
 “No, you aren’t a student/students.” [presupposition uncancelable]
- (d) Katse,            ma        den        eisai            foitit-is!  
 wait.imp        but        NEG        are.2PL        student-SG  
 “Wait, but you aren’t a student.” [presupposition challenged]

Eventually, the presupposition induced by unagreement is subject to filtering by conditionals. The sentence in (32a) presupposes that the addressee is an academic. This remains intact in the consequent of the conditional in (32b), as expected for a presupposition. If the antecedent of the conditional entails that the addressee is an academic, however, the presupposition is filtered out. Hence, (32c) does not presuppose that the addressee actually is an academic. This closely resembles the behavior we have seen for APCs in (19) above.

- (32) (a) Oi                    akadimaikoi    echete        provlima.  
 DET.PL.NOM    academics    have.2PL    problem  
 “You academics have a problem.”
- (b) An                perasoun        ta                metra,    oi                akadimaikoi  
 if                pass.SUBJ.3PL    DET.PL.NOM    measures    DET.PL.NOM    academics  
 echete        provlima.  
 have.2PL    problem  
 “If the measures pass, you academics have a problem.”

- (c) An (esy) eisai akadimaikos oi akadimaikoi  
 if you.SG are.2SG academic DET.PL.NOM academics  
 echete provlima.  
 have.2PL problem  
 “If you are an academic, you academics have a problem.”

These observations all point to the conclusion that with respect to the role of person features unagreement behaves like APCs after all, lending credence to an account of unagreement building on this parallel.

## 5. Quantified Phrases

While I cannot do justice to the rich topic of the interaction of quantifiers with the phenomena discussed here, I want to comment briefly on an issue raised by a reviewer. Consider the following (slightly modified) example provided by the reviewer.

- (33) Most of us Czechs are experts on beer, until we come to Bavaria.

The reviewer suggests that this sentence does not give rise to the inference that the speaker is one of the Czech beer experts, and that the present account wrongly predicts this inference. My intuition, supported by discussion with a native speaker of English, is that this does indeed not seem to be necessary. For example, the sentence could be uttered by a Czech person who has no particular interest in beer, but wants to comment on their (stereotyped) fellow-citizens. However, the reading of (33) on which the speaker is a beer expert is certainly possible, and may be the more salient one.

The inference that the speaker is Czech seems to be a proper presupposition, triggered by the first person features in the APC “us Czechs.” The controversial property is the speaker’s experthood. The presupposition trigger in “us Czechs” does not scope over the predicate *BEER EXPERT* and is therefore an unlikely source for the potential inference that the speaker is a beer expert. Instead, the person-related presupposition triggered by “we” in the second clause appears to be responsible.

Contrary to the reviewer’s worry, though, I do not see any particular problems arising for the approach advocated here. The use of “we” in the second clause may be construed as anaphoric in two ways, either picking out the set denoted by the whole quantified construction, i.e., the majority of Czechs, who are beer experts, or the restrictor of the quantifier, i.e., “us Czechs.” This vagueness seems to be what causes the ambiguity with respect to the speaker’s experthood. The first person presupposition of “we” requires that the speaker is a member of whatever set is construed as the antecedent. If it is “us Czechs,” nothing spectacular happens because this expression already contains a first person presupposition. Assuming that the initial presupposition is accommodated, we get the inference that the speaker is Czech, leaving open

the possibility that he or she is not a beer expert. On the other hand, if the whole set of people for which the quantified expression holds true is picked out, the effect of the presupposition is the requirement that the speaker be a member of that set. When this is accommodated, we get the stronger inference that the speaker is one of the Czech beer experts. Importantly, the presuppositions themselves are invariant in this view. What varies is what set they apply to.

## 6. Conclusion

In this article I have shown that both APCs and unagreement constructions give rise to presupposition effects associated with person features. On this basis, I have argued that the semantic analysis of unagreement should parallel that of APCs in that both contain presuppositions related to person features. Furthermore, I have shown that Torrego's (1996, 115) claim "that [the unagreement structure in (22); GFKH] implies that at least one of the members of the first person plural pronoun 'we' is not a linguist" is too strong if we assume this to be a claim about the assertions or presuppositions involved by unagreement. One way to interpret this is that unagreement does not need to make reference to two distinct sets, a "we" or "you" set and the set denoted by the subject. Instead, the data can be accounted for by assuming that the denotation of the subject is restricted by the presupposition induced by the person features involved in unagreement structures.

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# The Verbal Plural Marker in Shumcho

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**Abstract:** Shumcho has a pluractional marker that is homophonous with the intransitivizing (anticausative, reflexive, reciprocal) “middle” marker but can be applied to transitive and intransitive verbs alike and requires a plural subject. The resulting verb forms can be shown to express a distributive verbal plural. It is argued that the marker evolved from the reciprocal use of the middle marker by lifting the reciprocity requirement but retaining the distributive plural feature. The fact that it can also be applied to verb forms that are already derived by the middle marker but does not bring about the same morphophonological changes suggests that it has gained an independent status as a separate marker.

**Keywords:** Shumcho; West Himalayish; pluractionality; reciprocity.

## 1. Introduction

Shumcho has a pluractional marker that hardly seems attested elsewhere in West Himalayish. Interestingly, the marker is homophonous with the “middle” marker and requires a pluralic subject. In this article I will give a descriptive account of verbal plural as found in Shumcho and make a suggestion as to the origin of the respective marker. Section 2 introduces the language and its linguistic environment. In Sections 3 and 4 I will illustrate the use of the marker with different verb types and highlight some effects and peculiarities. It will be shown that the marker expresses distributive pluractionality. Section 5 is concerned with the relation of the pluractional and the middle marker. I will argue that the pluractional marker is derived from the reciprocal use of the middle marker and suggest a time frame for its grammaticalization. Section 6 concludes the article by considering other related languages.

## 2. The Shumcho Language and Its Linguistic Environment

The Shumcho language is a small, endangered West Himalayish (Tibeto-Burman) language spoken in a few villages in the Kinnaur District of Himachal Pradesh in the Indian Himalayas. Although the existence of the language has been known since the early 19th century (see, e.g., Gerard 1842, 551), systematic research began only in recent times (see Huber 2007). Table 1 lists the villages where the language is spoken by some or all population groups (population figures are taken from the Census of India 2011). In many villages in Kinnaur the different castes speak different (indigenous) languages. According to current knowledge, Shumcho is spoken by all castes in the villages of Kanam, Labrang, and Spillo (including Karla) and apparently also in Shyaso, Rushkalang, and Taling, whereas in Jangi, Lippa, Asrang, and Sunnam it is spoken by the lower caste(s) only; the high caste speaks different languages there.

|                     | Spoken by all castes  | Spoken by low caste(s) | Other languages spoken                        |
|---------------------|-----------------------|------------------------|---|
| <b>Humcho area</b>  | Kanam (pop. 887)      | —                      | —   |
|                     | Labrang (pop. 828)    | —                      | —   |
|                     | Spillo (pop. 757)     | —                      | —   |
| <b>Ropa valley</b>  | Shyaso (pop. 110)     | —                      | —   |
|                     | Rushkalang (pop. 316) | —                      | —   |
|                     | Taling (pop. 56)      | —                      | —   |
|                     | —                     | Sunnam (pop. 594)      | high caste speaks <i>Sunnami</i>              |
| <b>Jangram area</b> | —                     | Jangi (pop. 1,157)     | high caste speaks <i>Jangrami (variety B)</i> |
|                     | —                     | Lippa (pop. 1,161)     | high caste speaks <i>Jangrami (variety A)</i> |
|                     | —                     | Asrang (pop. 338)      | high caste speaks <i>Jangrami (variety A)</i> |

**Table 1.** Villages where the language is spoken.

There does not seem to be an established name for the language among its speakers, although they distinguish it from other local languages. The term *Shumcho* [ɕumtsʰo:] (*ɕum* “three,” *tsʰo*: ca. “bunch, group”) actually refers to the area comprising the three villages of Kanam, Labrang, and Spillo (*Shumcho* is the Kinnauri version of that name,

while locally the area is called *Humcho* [humts<sup>h</sup>o:], and speakers from the Shumcho area occasionally refer to the language as *humts<sup>h</sup>o: kat* ‘‘Shumcho language.’’ However, the language is also spoken in the Ropa valley and the Jangram area. Speakers are mostly bilingual (Hindi) and often plurilingual (other local languages, English). No number of fluent speakers can be given with any degree of certainty. For various aspects of the grammar of Shumcho see Huber (2011; 2013).<sup>1</sup>

Further indigenous languages spoken in Kinnaur include the Tibetan varieties of upper Kinnaur (from Pooh onwards) and lower Kinnaur (the villages of Nesang, Charang, and Kunnu), the West Himalayish languages Jangrami (spoken by the high caste in the villages of Jangi, Lippa, and Asrang), Sunnami (spoken only by the high caste in the village of Sunnam), Chhitkuli (spoken in the villages of Rakchham and Chhitkul), and the varieties of Kinnauri and the Indo-Aryan Oras Boli, spoken by, respectively, the high caste and the low castes in lower Kinnaur, roughly from the Jangram area downwards (Kinnauri is also spoken in the villages of Ropa and Gyabong in the Ropa valley in upper Kinnaur; for the location of the various villages see the maps).<sup>2</sup>

### 3. The Pluractional Marker *-ε*

The Shumcho pluractional marker *-ε* can occur with intransitive and transitive verbs. As the contrast of (1b) vs. (2b) shows, verbs featuring *-ε* require a pluralic subject.<sup>3</sup>

- (1) (a) dopaŋ    dze-u  
           they     go-PERF  
           ‘‘They went.’’

1 All the Shumcho data are from my fieldwork (ongoing since 2002), drawn from elicitations, narratives, and interviews/conversations, and represent the Kanam variety of Shumcho. Since these are data from ongoing research, future corrections/revisions cannot be excluded. The representation of vowel quantities in the transcriptions of Shumcho data may not be entirely accurate in some cases. Certain glosses and labels are still preliminary. As the citation form of verbs I use the infinitive (*VERB-ma*). In the cited data I retain the orthography of the original publication. Very special thanks go to Kesar Negi and Kailash Negi of the village of Kanam and all the other people in Kinnaur without whose continuing support this research would not be possible. Thanks are also due to Friedrich Neubarth and an anonymous reviewer for their comments on earlier drafts of this article.

2 Within West Himalayish, Shumcho appears to form a group with Kinnauri, Chhitkuli, Jangrami, Kanashi, Tinani, and Patani (all spoken in Himachal Pradesh). Gerard’s (1842) Sunnami (‘‘T.heburskud’’) data and the present author’s field data alike suggest that Sunnami does not belong to this group but should rather be placed with the West Himalayish languages spoken in Uttarakhand.

3 The marker *-ε* precedes the tense/aspect marker (in [1a] and [2a] *-u*) or the infinitive marker of a lexical verb. It cannot be used with sibilant-final verbs such as *pos-ma* ‘‘sit’’ or *po:ε-ma* ‘‘forget’’ (\**posie-ma*, \**po:εie-ma*, etc.).

- (b) dopaŋ    dze:-ε-u  
 they        go-PLURACT-PERF  
 “They went (individually, each).”

- (2) (a) do        dze-u  
 s/he        go-PERF  
 “S/He went.”

- (b) \*do        dze:-ε-u  
 s/he        go-PLURACT-PERF  
 [intended reading: “S/He went (pluractional).”]

The marker *-ε* signals as many “actions” of the type denoted by the respective verb as there are members in the set constituted by the pluralic subject. These “actions” are understood as taking place individually and independently of each other. For example, *dze:εu* in (1b) may indicate that the respective individual acts of *going* took place along different paths, in different locations or directions, or at different times. Pluractional verb forms thus receive a distributive interpretation. Consequently, such forms do not lend themselves to a cumulative reading. The use of verb forms with *-ε* in contexts where the pluralic subject acts as a group is rejected by my consultants, as illustrated in (3b).

- (3) (a) donic        ɲamp<sup>h</sup>o:        dze-u  
 those.two    together        go-PERF  
 “The two of them went together.”

- (b) donic        (\*ɲamp<sup>h</sup>o:)    dze:-ε-u  
 those.two    (together)    go-PLURACT-PERF  
 “Both of them went (\*together).”

I will therefore suggest that *-ε* pluralizes events (in accordance with the number of elements contained in the pluralic subject), and that resulting activities or states are predicated separately. This type of event pluralization has consequences that depend on the verb or event type, which will be briefly illustrated below.

Verbs resulting in a state that is evaluated relative to its opposition in such a way that it needs to be reversed before it can be brought about again with respect to the same entity require a distinct object entity (or distinct set of object entities) for each event so that each instance of the respective resulting state can be predicated separately. Thus, (4a), featuring an unmarked form of the resultative verb *cut down* and the countable object *three trees*, allows for an interpretation where three trees were cut down by

seven workers in a collaborative effort. In the pluractional example (4b), however, each worker cut down a different tree. Here, each *cut-down* state is predicated of a separate tree because seven distinct instances of a *cut-down* state cannot be predicated of the same *tree* entity independently of each other. Example (4c), the pluractional counterpart of (4a), therefore only allows for a reading in which each of the seven workers cut down three different trees; each *cut-down* instance is predicated of a different set of three trees.

- (4) (a) do    εinie    nokar    hum    bo:tʰaŋ    pʰal-u  
           that    seven    worker    three    tree        fell-PERF  
           “The/those seven workers cut down three trees.”  
           [also: cooperated in felling three trees]

- (b) do    εinie    nokar    it        bo:tʰaŋ    pʰal-ε-u  
           that    seven    worker    one     tree        fell-PLURACT-PERF  
           “The/those seven workers (each) cut down a/one tree.”  
           [i.e., each worker felled a different tree → total number of felled trees =  
            $7 \times 1 = 7!$ ]

- (c) do    εinie    nokar    hum    bo:tʰaŋ    pʰal-ε-u  
           that    seven    worker    three    tree        fell-PLURACT-PERF  
           “The/those seven workers (each) cut down three trees.”  
           [i.e., each worker felled three trees → total number of felled trees =  $7 \times 3 = 21!$ ]

The effect is, of course, lost if the object is not a count noun but a mass noun like *rice* in (5):

- (5) nokar-paŋ    raɬʰ    dza:-ε-u  
       worker-PL    rice    eat-PLURACT-PERF  
       “The workers (each) ate rice.”

In contrast, verbs expressing actions that affect the object but do not result in a state that needs to be reversed before it can be brought about again with respect to the same entity (e.g., *beat* in [6]) also allow for a singular object despite the plural action, as in (6a). For many speakers, however, verbs like *beat* rather pattern with resultatives; see, e.g., the indicated preferred interpretation of (6b). If the object is pluralic, as in (6c), which is understood as each soldier having beaten each villager, every member of the object set is necessarily affected by an instance of the respective action originating from each member of the subject set.

- (6) (a) % dopaŋ ha:ri-ra toŋ-ε-u  
 they H.-DAT beat-PLURACT-PERF  
 “They (each) beat Haari.”
- (b) dopaŋ itlaŋ-ra toŋ-ε-u  
 they somebody-DAT beat-PLURACT-PERF  
 “They (each) beat someone.”  
 [preferred reading: each one beat someone else]
- (c) senik-paŋ de:eaŋ-pa-paŋ-ra toŋ-ε-u  
 soldier-PL village-inhabitant-PL-DAT beat-PLURACT-PERF  
 “The soldiers (each) beat the villagers.”

Likewise, verbs that express a mental state with respect to the object (e.g., *dislike*) or an activity targeting the object (e.g., *watch*) do not require a distinct object entity for each event (e.g., [7] and [8]):

- (7) raksəs-paŋ do-ra ma-kju:-ε-u  
 demon-PL s/he-DAT NEG-like-PLURACT-PERF  
 “The demons (each) disliked him.”
- (8) gop mi: laga:n k<sup>h</sup>on-ε-u  
 many person Lagaan watch-PLURACT-PERF  
 “Many people (individually) watched (the movie) ‘Lagaan.’”

The presence or absence of  $\epsilon$  can also be correlated with the choice of universal quantifiers. Notice the contrast in (9), where the pluractional verb form has the distributive universal quantifier *aŋaŋk<sup>h</sup>* “every” as its subject, whereas the cumulative universal quantifier *siŋ* “all” appears as the subject of the unmarked verb form.

- (9) sat-paŋ . . . siŋ it wāū,  
 god-PL all one happen/become:CONV

dat<sup>h</sup> dzi de:eaŋ-ra . . . batsa:-min,  
 then this village-DAT save-PERF

aŋaŋk<sup>h</sup> it waŋ-ε-u  
 every one happen/become-PLURACT-CONV

“(By) **all** joining/having joined forces (lit. ‘becoming/having become one’), the gods . . . had then . . . saved this village, (by) **everyone** joining/having joined forces (with everyone).”



- (13) (a) dopaŋ toŋ-k<sup>h</sup>-u  
 they beat-INTR-PERF  
 “They beat each other.” “They fought.”  
 [allows a sloppy reciprocal reading: everybody beat *somebody* else]
- (b) dopaŋ toŋ-k<sup>h</sup>-ε-u  
 they beat-INTR-PLURACT-PERF  
 “They beat each other.” “They fought.”  
 [forces an exhaustive reciprocal reading: everybody beat *everybody* else]

Shumcho has, of course, additional means beside the marker  $-\epsilon$  for expressing distributivity, which, however, merit a study of their own.

In many languages, verbs marked as pluractional indicate iterativity, habituality, and the like; see, e.g., Newman (2012). In Shumcho, however, no such readings are available with verb forms employing the pluractional marker  $-\epsilon$  (as also expected in view of the plural subject requirement). Continuativity, iterativity, or habituality is expressed by means of constructions like those in (14). The expression of habituality usually involves the imperfective marker  $-i$ , as in (14a). Example (14b) shows the continuative construction *VERB-u-o pos-ma* “keep on VERBing.” As a stylistic means to indicate a long-lasting continuation or a large number of repetitions in a continuative or a converb construction, the verb representing the action in question may be repeated a number of times (see the parenthesized portions of [14b] and [14c]). Repeated action may also be indicated by adverbials such as *many times* in (14d) or by reduplication of a converb, as in (14e). Crucially, however, all these constructions lack distributivity over the subject as forced by the pluractional marker  $-\epsilon$ .

- (14) (a) do dze-i taε-e  
 s/he go-IMPF be(3)-PAST  
 “S/He used to go.”
- (b) do dze-u=o (dze-u=o dze-u=o . . .) pos-u  
 s/he go-PROG<sup>2</sup>=EMPH sit-PERF  
 “S/He kept on going.” “S/He went and went . . .”
- (c) do p<sup>h</sup>ãũ (p<sup>h</sup>ãũ p<sup>h</sup>ãũ . . .) dze:-min  
 s/he search:CONV GO-PERF  
 “S/He went (by) searching (searching, searching . . .).”

- (d) *kjum-u*                    *put-ma-eam*                    *miti*   *do-k<sup>h</sup>*                    *gop*   *p<sup>h</sup>e:ra:*  
house-LOC                    reach-INF-until                    flea    that-ERG                    many time  
  
*ba:raŋ*                    *pea-u*                    *pin-u*  
load                    throw-CONV                    send-PERF  
“Until reaching home, Flea dropped the load many times.”
- (e) *miti*    *do=li*                    *mesaŋk<sup>h</sup>*                    *mesaŋk<sup>h</sup>*                    *ba:raŋ=niŋ*  
flea    that=also                    slowly                    slowly                    load=etc.  
  
*pea-u*                    *pea-u*                    *kjum-u*                    *put-u*  
throw-CONV                    throw-CONV                    house-LOC                    reach-PERF  
“Slowly, slowly, by dropping the load again and again also Flea reached home.”

#### 4. Pluractional *-ε*: Some Peculiarities

The pluractional marker *-ε* exhibits some peculiarities with respect to case marking of transitive subjects and subject agreement. Both cases will briefly be discussed in turn.

In Shumcho, subjects of transitive verbs featuring the perfective or past markers *-u*, *-min*, and (for some speakers) *-riu* may be marked with ergative case, as illustrated in (15a).<sup>5</sup> However, as (15b) shows, subjects of transitive verbs featuring *-ε* cannot receive ergative case marking.

- (15) (a) *nokar-paŋ(-k<sup>h</sup>)*    *i*                    *bo:t<sup>h</sup>aŋ*    *p<sup>h</sup>al-u*  
worker-PL-ERG    one    tree                    fell-PERF  
“*The workers cut down a/one tree.*”  
[also: cooperated in felling one tree]
- (b) *nokar-paŋ(\*-k<sup>h</sup>)*    *i*                    *bo:t<sup>h</sup>aŋ*    *p<sup>h</sup>al-ε-u*  
worker-PL                    one    tree                    fell-PLURACT-PERF  
“*The workers (each) cut down a/one tree.*”  
[the number of felled trees corresponds to the number of workers]

Shumcho has tense/aspect/mood (TAM) markers that are followed by a subject agreement marker and TAM markers that cannot be followed by AgrS morphology. Verbal forms employing the tense or mood markers *-re* (past), *-ro* (future), *-gjo* (past/non-future irrealis), and *-ri* (assertive) require subject agreement, as opposed to forms employing

<sup>5</sup> Ergative is perhaps not a purely grammatical case in Shumcho since its use is possible here but seemingly not mandatory and it is often omitted in actual, real-life discourse. In addition to grammatical preconditions, discourse-related factors may also play a role.

the markers *-u* (progressive), *-i* (imperfective), or the aforementioned perfective or past markers *-u*, *-min*, and *-riu*, which do not take subject agreement.<sup>6</sup> Example (16) shows non-progressive and progressive past tense forms of the verb *dze:-ma* “go,” displaying the past tense morpheme *-re* followed by the respective subject agreement marker. In the non-progressive forms of (16), *-re* (+AgrS) is attached to the verb root. In the progressive forms (which require an auxiliary construction), the verb is followed by the progressive marker *-u*, whereas the past tense morpheme *-re* and the subject agreement marker occur on the auxiliary verb. Note that in first person plural forms such as (16c) two AgrS markers are available (*-ε* and *-ĩ*).<sup>7</sup>

- (16) (a) gi: dze-re-k<sup>h</sup> / dze-u to-re-k<sup>h</sup>  
 I go-PAST-1SG / go-PROG be-PAST-1SG  
 “I went / was going.”
- (b) giran dze-re-na: / dze-u to-re-na:  
 thou.HON go-PAST-2SG.HON / go-PROG be-PAST-2SG.HON  
 “You went / were going.”
- (c) ninpaŋ dze-re-ε or dze-re-ĩ / dze-u to-re-ε or to-re-ĩ  
 we.EXCL go-PAST-1PL go-PAST-1PL / go-PROG be-PAST-1PL be-PAST-1PL  
 “We went / were going.”

6 Both *-u* markers are formally indistinguishable but occur in mutually exclusive distribution: perfective/past *-u* cannot occur in an auxiliary construction, progressive *-u* must occur with an auxiliary. In addition, there is a homophonous converb marker *-u* which may in fact be only another instance of one or the other. Since it is often not clear to what extent serialized verbs express separate, successive events or events that overlap, or are inseparable from each other, no safe decision can be made at present. An *-u* marker is also found in the continuative construction; see above (14b).

7 Shumcho has the following subject agreement markers: 1SG *-k<sup>h</sup>*, 2SG.HON *-na:*, 2SG.NHON *-n*, 1PL and 2PL *-ε* or *-ĩ*, 3SG.HON and 3PL.HON *-ε*, 3SG.NHON and 3PL.NHON *-Ø*. They generally follow the indicated tense or mood markers on the main verb or, in auxiliary constructions, on the auxiliary verb. The dual has no separate set of AgrS markers but also uses the plural markers. For details, special cases, and some discussion see Huber (2013). 1PL and 2PL *-ĩ* appears to be a secondary marker whose status vis-à-vis *-ε* is not yet clear. Its co-occurrence with *-ε* possibly hints at an earlier, different paradigm. In the contemporary language the difference seems to be merely stylistic. Elderly speakers also use *-k<sup>h</sup>* as a 1PL.INCL marker. It is not clear at present whether 1PL.INCL *-k<sup>h</sup>* is cognate with 1SG *-k<sup>h</sup>* or the deaffricized remnant of an originally affricatic marker *-ke* (or similar) or traces back to an original voiceless velar marker. Despite being homophonous with pluralional *-ε*, the agreement markers 1PL/2PL *-ε* and 3HON *-ε* should not be confused with the pluralional marker. As indicated, they occupy a different slot in verbal morphology, and neither of them takes part in expressing a distributive verbal plural. 3HON *-ε*, moreover, can occur with a singular as well as a plural subject. That these markers all share the same shape is probably only a historical accident. However, I cannot delve into the comparative morphology of West Himalayish (or Tibeto-Burman) agreement systems here.

As shown in (17), subject agreement morphology cannot occur after tense/aspect markers such as *-u*, *-min*, or *-i*.

- (17) (a) gi: dze-u(\*-k<sup>h</sup>)  
 I go-PERF(-1SG)  
 “I went.”
- (b) giran dze-i(\*-na:)  
 thou.HON go-IMPF(-2SG.HON)  
 “You (will) go.”
- (c) niŋpaŋ dze:-min(\*-e/\*-ĩ)  
 we.EXCL go-PERF(-1PL/-1PL)  
 “We had gone.”

Now consider (18a), where pluractional marker, past tense morpheme, and subject agreement are found on the same verb. As (18a) shows, pluractional *-e* is not compatible with verb forms that take subject agreement. This conflict does not arise in (18b), the progressive counterpart of (18a), where *-e* occurs on the main verb but the AgrS marker (*-e* or *-ĩ*) and the past tense marker occur on the auxiliary verb.

- (18) (a) \*niŋpaŋ dze-**e**-te-**e** / dze-**e**-te-**ĩ** (-e-te-<-e-re-)  
 we.EXCL go-PLURACT-PAST-1PL  
 [intended reading: “We went (individually).” “Each of us went.”]  
*PLURACT and AgrS on the lexical verb*
- (b) niŋpaŋ dze:-**e**-u to-re-**e** / to-re-**ĩ**  
 we.EXCL go-PLURACT-PROG be-PAST-1PL  
 “We were going (individually).” “Each of us was going.”  
*PLURACT on the lexical verb, AgrS on the auxiliary*

In order to produce a grammatical near-equivalent of (18a), speakers may—according to my consultants—resort to using a pluractional form with the perfective/past marker *-u* (which cannot be followed by subject agreement) instead of *-re* (as in 19a) or to employing the distributive quantifier *aŋk<sup>h</sup>* “every” (as in 19b).

- (19) (a) niŋpaŋ dze:-**e**-u  
 we.EXCL go-PLURACT-PERF  
 “We went (individually).” “Each of us went.”

- (b) *niŋpaŋ aʃaŋk<sup>h</sup> dze-re-ε / dze-re-ĩ*  
 we.EXCL every go-PAST-1PL  
 “Each/every one of us went.”

In view of these peculiarities the pluractional marker *-ε* does not seem fully integrated into the Shumcho verbal system, which may indicate a rather recent innovation.

## 5. Pluractional *-ε* and Intransitive (“Middle”) *-ε*

Interestingly, the language has a homophonous detransitivizing marker *-ε* (anticausative, reflexive, reciprocal) that appears to occupy the same position in the surface string; some examples are given in (20).<sup>8</sup> Cognates of detransitivizing *-ε* are found in many West Himalayish and other Tibeto-Burman languages; see, e.g., LaPolla (1996; 2013).

- (20) (a) *pra:-ma* “spread” > *pra:-ε-ma* “spread (intr.)”  
 (b) *dzura:-ma* “prepare” > *dzura:-ε-ma* “prepare oneself”  
 (c) *kre:-ma* “attack with horns” > *kre:-ε-ma* “attack each other with horns,  
 butt horns”  
 (d) *εu:-ma* “ask” > *εu:-ε-ma* “ask each other”

Verb forms with *-ε* may therefore be ambiguous between a pluractional and an intransitive (detransitivized) reading, as schematically shown in (21).

- (21) (a) *pra:-ma* “spread” > *pra:-ε-ma*  
 i) intr. “spread (intr.)”  
 ii) trans. “spread OBJ” (pluract.)  
 (b) *dzura:-ma* “prepare” > *dzura:-ε-ma*  
 i) intr. “prepare oneself”  
 ii) trans. “prepare OBJ” (pluract.)  
 (c) *kre:-ma* “attack with horns” > *kre:-ε-ma*  
 i) intr. “attack each other with horns,  
 butt horns”  
 ii) trans. “attack OBJ with horns” (pluract.)

8 Which of the options (anticausative, reflexive, or reciprocal) is realized with a particular verb appears to be lexically fixed. For example, *εu:-ε-ma* “ask each other” or *toŋk<sup>h</sup>-ma* “beat each other, fight” (see below [23]) are not interpretable as “ask oneself” or “beat oneself.”

- (d) *eu:-ma* “ask” > *eu:-ε-ma*  
 i) intr. “ask each other”  
 ii) trans. “ask” (pluract.)

Ambiguities are usually resolved by the syntactic or discourse context. Additionally, they are resolved in verbal forms that involve subject agreement. Since, contrary to pluractional *-ε*, the detransitivizing marker *-ε* can co-occur with subject agreement on the same verb, the form *εuεteε* (or *εuεteĩ*) in (22) is interpretable only as a detransitivized, reciprocal form (as in [22a]) of *eu:-ma* “ask” but not as a transitive pluractional form (as in [22b]).

- (22) (a) *ninpaŋ*    *εu-ε-te-ε* / *εu-ε-te-ĩ*    (*-ε-te-<-ε-re-*)  
 we.EXCL    ask-INTR-PAST-1PL  
 “We asked each other.”
- (b) \**ninpaŋ*    *εu-ε-te-ε* / *εu-ε-te-ĩ*  
 we.EXCL    ask-PLURACT-PAST-1PL  
 [intended reading: “Each of us asked (someone else).”]

The common shape of the intransitive (anticausative, reflexive, reciprocal) and pluractional markers is perhaps not coincidental: reciprocity also involves a distributive verbal plural. The comparison in Table 2 shows that reciprocal and pluractional verb forms share a range of properties.

|   | Reciprocal <i>-ε</i> | Pluractional <i>-ε</i>  |
|---|----------------------|-------------------------|
| <b>Pluralic SUBJ requirement (distributive verbal plural)</b> | yes                  | yes                     |
| <b>Ergative SUBJ</b>  | no                   | no                      |
| <b>Can be applied to transitive verbs</b>                     | yes                  | yes                     |
| <b>Can be applied to intransitive verbs</b>                   | no                   | yes                     |
| <b>(Option:) OBJ is member of SUBJ set</b>                    | yes                  | yes<br>(in reciprocals) |
| <b>(Option:) OBJ is not a member of SUBJ set</b>              | no                   | yes<br>(in transitives) |
| <b>Compatible with AgrS on the same verb</b>                  | yes                  | no                      |

**Table 2.** Pluractional vs. reciprocal verbal forms.

The fact that both reciprocal verbs and pluractional verb forms require a pluralic subject (i.e., express a distributive verbal plural) but do not allow ergative case marking, together with the fact that the pluractional marker  $-\epsilon$  shares its shape with the intransitive marker  $-\epsilon$ , suggests that pluractional  $-\epsilon$  evolved from the reciprocal use of intransitive  $-\epsilon$  by lifting the reciprocity requirement but retaining the distributive plural feature, which i) allows for the application of  $-\epsilon$  with non-reciprocal intransitive verbs, ii) also allows for direct objects that are not members of the pluralic subject set, and iii) explains the fact that pluractional verb forms receive a distributive interpretation.

While it seems likely that historically the pluractional marker  $-\epsilon$  is an offshoot of the homophonous intransitive marker, their status as two synchronically separate markers also becomes evident from their respective behavior in certain morphophonological contexts, as will be discussed in the following section.

### 5.1 Pluractional $-\epsilon$ as an Independent Marker

Additional evidence for the status of pluractional  $-\epsilon$  as an independent marker comes from two facts: it can be applied to verbs derived by intransitive  $-\epsilon$ , and it does not trigger certain morphophonological effects found with intransitive  $-\epsilon$ . Let us first consider the application of pluractional  $-\epsilon$  to verbs already derived by intransitive  $-\epsilon$ . While pluractional  $-\epsilon$  cannot attach to derived intransitives in which the intransitive marker surfaces in its original shape  $-\epsilon$  (e.g., *\*pra:εie-ma* < *pra:ε-ma* “spread (intr.),” cf. above [21]; see also footnote 3 above), it can attach to verbs where the suffixation of intransitive  $-\epsilon$  brought about a morphophonological change. I will briefly illustrate the respective changes and present some examples.

After roots ending in /ŋ/, /m/, /n/, /r/, and /l/, the intransitive marker  $-\epsilon$  undergoes a phonological change and surfaces as /k<sup>h</sup>/, /p<sup>h</sup>/, or /t<sup>h</sup>/, obviously a residue of an intermediary plosive-sibilant cluster resulting from epenthesis of a homorganic plosive where the sibilant developed into aspiration of the plosive, as shown in (23). Note that the forms derived in this way cannot be alternatively interpreted as transitive pluractional forms (e.g., *\*kral<sup>h</sup>-ma* “make run [PLURACT],” etc.).

|  |   |
|--|---|
| (23) ŋ+ε > ŋke > ŋk <sup>h</sup> <i>toŋ-ma</i> “beat”:         | toŋ+ε > toŋk <sup>h</sup> <i>toŋk<sup>h</sup>-ma</i> “beat e.o.”                                    |
| m+ε > mpe > mp <sup>h</sup> <i>k<sup>h</sup>am-ma</i> “dress”: | k <sup>h</sup> am+ε > k <sup>h</sup> amp <sup>h</sup> <i>k<sup>h</sup>amp<sup>h</sup>-ma</i> “wear” |
| n+ε > nte > nt <sup>h</sup> <i>an-ma</i> “erect”:              | an+ε > ant <sup>h</sup> <i>ant<sup>h</sup>-ma</i> “stand up”  |
| r+ε > rte > rt <sup>h</sup> <i>dzar-ma</i> “glue”:             | dzar+ε > dzart <sup>h</sup> <i>dzart<sup>h</sup>-ma</i> “stick”                                     |
| l+ε > lte > lt <sup>h</sup> <i>kral-ma</i> “make run”:         | kral+ε > kral <sup>h</sup> <i>kral<sup>h</sup>-ma</i> “run”   |

After roots ending in /p<sup>h</sup>/ or /k/, suffixation of intransitive *-ε* results in a plosive-sibilant cluster directly, the sibilant again being lost as a result of deaffrication:<sup>9</sup>

- (24) k+ε > k<sup>h</sup> *εó:-ma* (< *εok-ma*) “make ride”: *εok+ε* > *εok<sup>h</sup>* *εok<sup>h</sup>-ma* “ride”  
 p<sup>h</sup>+ε > p<sup>h</sup> *lap<sup>h</sup>-ma* “teach”: *lap<sup>h</sup>+ε* > *lap<sup>h</sup>* *lap<sup>h</sup>-ma* “learn”

The same change can be observed with the likewise sibilantic 1st/2nd person object agreement marker *-s* (illustrated in [25]) and is also found elsewhere in the language, e.g., the loanwords in (28).<sup>10</sup>

- (25) (a) *kre:-ma* “attack with horns” > *kre:kre:-s-ma* “attack me/us/you with horns”  
 (b) *εu:-ma* “ask” > *εu:εu:-s-ma* “ask me/us/you”

As in the case of intransitive *-ε*, suffixation of the object agreement marker *-s* yields an intermediary plosive-sibilant cluster (as in [26]), or results in a plosive-sibilant cluster directly (as in [27]), deaffrication of which results in a derived marker /k<sup>h</sup>/, /p<sup>h</sup>/ or /t<sup>h</sup>/.

- (26) η+s > ηks > ηk<sup>h</sup> *toη-ma* “beat”: *toη+s* > *toηtoηk<sup>h</sup>-ma* “beat me/us/you”  
 m+s > mps > mp<sup>h</sup> *k<sup>h</sup>am-ma* “dress”: *k<sup>h</sup>am+s* > *k<sup>h</sup>amk<sup>h</sup>amp<sup>h</sup>-ma* “dress 1st/2nd”  
 n+s > nts > nt<sup>h</sup> *an-ma* “erect”: *an+s* > *anant<sup>h</sup>-ma* “make 1st/2nd stand up”  
 r+s > rts > rt<sup>h</sup> *dzar-ma* “glue”: *dzar+s* > *dzardzart<sup>h</sup>-ma* “glue me/us/you”  
 l+s > lts > lt<sup>h</sup> *kral-ma* “make run”: *kral+s* > *kralkral<sup>h</sup>-ma* “make 1st/2nd run”

- (27) k+s > k<sup>h</sup> *εó:-ma* “make ride”: *εok+s* > *εok<sup>h</sup>* *εok<sup>h</sup>εok<sup>h</sup>-ma* “make 1st/2nd ride”  
 (< *εok-ma*)  
 p<sup>h</sup>+s > p<sup>h</sup> *lap<sup>h</sup>-ma* “teach”: *lap<sup>h</sup>+s* > *lap<sup>h</sup>* *lap<sup>h</sup>lap<sup>h</sup>-ma* “teach me/us/you”

Deaffrication in comparable phonological contexts also occurs in the loanwords in (28) (note that the counterpart of [28c] in the neighboring language Jangrami also has the epenthetic plosive /k/ but preserves final /s/).

9 *εó:-ma* belongs to a class of verbs that lost a final velar plosive in their transitive versions (perhaps compensated for by the high tone on the vowel). That velar plosive is preserved (or restored) only in object agreement and intransitivized forms (see below). It is, however, present in the Kinnauri cognate *shog-mig* [make.ride-INF] “make ride”/*shog-shi-mig* [make.ride-INTR-INF] “ride” (Bailey 1911, 35).

10 In Shumcho, 1st/2nd person object agreement usually involves the agreement marker *-s* and reduplication of the root; see Huber (2013) for details. In contrast to Kinnauri and other related languages, Shumcho generally lacks affricate-final lexemes or (affricatic) grammatical markers.

- (28) (a) Urdu *k<sup>h</sup>arč* “expense” > Shumcho *k<sup>h</sup>ort<sup>h</sup>* “expense”  
 (b) Tibetan *sems* “mind” > Shumcho *semp<sup>h</sup>* “mind”  
 (c) Tibetan *dgoyš* “evening” > Shumcho *goŋk<sup>h</sup>* “evening”  
 (also compare Jangrami *goŋks*)  
 (d) Tibetan *lcags* “iron” > Shumcho *teak<sup>h</sup>* “iron”

As shown in (29), the pluractional marker *-ε* can also be suffixed to intransitive verbs derived in this way by application of the intransitive marker *-ε*, which yields pluractional intransitive versions of these verbs. Notice that no further phonological changes take place here.<sup>11</sup>

- (29) *toŋk<sup>h</sup>-ma* “beat each other” +ε > *toŋk<sup>h</sup>-ε-ma* “beat each other” (intr. pluract.)  
*k<sup>h</sup>amp<sup>h</sup>-ma* “wear” +ε > *k<sup>h</sup>amp<sup>h</sup>-ε-ma* “wear” (intr. pluract.)  
*ant<sup>h</sup>-ma* “stand up” +ε > *ant<sup>h</sup>-ε-ma* “stand up” (intr. pluract.)  
*dzart<sup>h</sup>-ma* “stick” +ε > *dzart<sup>h</sup>-ε-ma* “stick” (intr. pluract.)  
*kralt<sup>h</sup>-ma* “run” +ε > *kralt<sup>h</sup>-ε-ma* “run” (intr. pluract.)  
*εok<sup>h</sup>-ma* “ride” +ε > *εok<sup>h</sup>-ε-ma* “ride” (intr. pluract.)  
*lap<sup>h</sup>-ma* “learn” +ε > *lap<sup>h</sup>-ε-ma* “learn” (intr. pluract.)

Contrary to intransitive *-ε*, suffixation of pluractional *-ε* to transitive verbs ending in /ŋ/, /m/, /n/, /r/, /l/, /k/, or /p<sup>h</sup>/ does not yield phonologically altered forms. For illustration, transitive pluractional and intransitive forms resulting from suffixation of intransitive and pluractional *-ε*, respectively, are given side by side in (30). It can be seen that epenthetic plosive insertion and deaffrication apply only with intransitive *-ε* but not pluractional *-ε*.

- (30) *toŋ-ma* “beat” +ε > *toŋ-k<sup>h</sup>-ma* “beat each other” (intr.)  
*toŋ-ε-ma* “beat” (trans. pluract.)  
*k<sup>h</sup>am-ma* “dress” +ε > *k<sup>h</sup>am-p<sup>h</sup>-ma* “wear” (intr.)  
*k<sup>h</sup>am-ε-ma* “dress” (trans. pluract.)  
*an-ma* “erect” +ε > *an-t<sup>h</sup>-ma* “stand up” (intr.)  
*an-ε-ma* “erect” (trans. pluract.)

<sup>11</sup> According to data that have only recently become available, a similar state of affairs is also found—at least in some speakers—with pluractional object agreement forms of verbs ending in /ŋ/, /m/, /n/, /r/, and /l/ (cf. [26]) in that *-ε* attaches to the epenthetic plosive in such forms, e.g., *toŋtoŋk<sup>h</sup>-ε-ma* “beat me/us/you [PLURACT].” These data were not available at the time of writing of Huber (2013), where, on the basis of the data available then, it is stated that no epenthetic plosive occurs in such cases. It is presently unknown to what extent speakers vary here and and if this correlates to other aspects of their respective idiolects.

|                           |      |                   |             |                   |
|---------------------------|------|-------------------|-------------|-------------------|
| <i>dzar-ma</i> “glue”     | +ε > | <i>dzar-tʰ-ma</i> | “stick”     | (intr.)           |
|                           |      | <i>dzar-ε-ma</i>  | “glue”      | (trans. pluract.) |
| <i>kral-ma</i> “make run” | +ε > | <i>kral-tʰ-ma</i> | “run”       | (intr.)           |
|                           |      | <i>kral-ε-ma</i>  | “make run”  | (trans. pluract.) |
| <i>εó:-ma</i> “make ride” | +ε > | <i>εo-kʰ-ma</i>   | “ride”      | (intr.)           |
| (< <i>εok-ma</i> )        |      | <i>εó:-ε-ma</i>   | “make ride” | (trans. pluract.) |
| <i>lapʰ-ma</i> “teach”    | +ε > | <i>lapʰ-ma</i>    | “learn”     | (intr.)           |
|                           |      | <i>lapʰ-ε-ma</i>  | “teach”     | (trans. pluract.) |

The contrasts in (30) can be interpreted in several ways. I will briefly outline two alternatives. On the one hand, the state of affairs met in (30) may indicate that when pluractional *-ε* is applied, the morphophonological changes observed with detransitivizing *-ε* and the object agreement marker *-s* are blocked by a morphological boundary that is not present in the case of detransitivizing *-ε* and the object agreement marker *-s*, which in turn may hint at different points of attachment of these elements in the derivation of the respective forms.<sup>12</sup> Likewise, the fact that subject agreement is possible in “middle” forms but not in their homophonous transitive pluractional counterparts (cf. above [22]) suggests that detransitivizing *-ε* and pluractional *-ε* enter the derivation at different points, whereby the latter perhaps blocks the spell-out of the AgrS features so that no pluractional forms with subject agreement on the same verb can be built. Of course, much depends here on one’s assumptions about the respective underlying structures and their derivation and in exactly what way syntax, morphology, and phonology interact.

Alternatively, the contrasts in (30) can also be seen in a different light. During the fieldwork it could be noticed that some (generally young) speakers also seem to employ detransitivizing *-ε* to yield unaltered intransitive forms of consonant-final verbs if they do not know a derived, phonologically altered form (instead of resorting, e.g., to a loan from Hindi), which suggests that they do not build the altered forms they use by employing a regular phonological process that applies when suffixing a sibilant to a particular consonant but learn them as separate lexical items.<sup>13</sup> This observation suggests that for such speakers at least, the phonologically altered forms in (30) are no longer transparent and that the process that led to the altered intransitivized forms is perhaps no longer productive in them. Taking this observation a step further, it might be hypothesized that

12 A related situation is perhaps found in negated short future forms (see Huber [2013, 232–34]), in which no (overt) tense morpheme occurs and the AgrS marker attaches directly to the verb stem. Here as well, the fact that no altered forms occur in comparable phonological contexts (*/ɲ/ + /ε/*, etc.) might be attributed to a morphological boundary, e.g., *dopaŋ ma-riŋ-ε* (\**marɪŋkʰ*) [they NEG-say-3HON] “They won’t tell (me/us/you)!”

13 It could also be noticed that certain young speakers no longer know (or recognize) morphophonologically altered object agreement forms (in that case, however, they resort to verb forms without object agreement morphology), or know some forms but not others, which again may indicate that such forms are learned separately.

the lack of a morphophonological change in the pluractional data in (30) is not due to a morphological boundary but simply results from the fact that the process causing the change is generally no longer active, which in turn would also imply that the altered intransitivized forms are remnants from an earlier stage of the language. This approach hinges, of course, on the question whether cognate pluractional markers are also to be found in related languages and what the respective situations there are, a matter about which presently next to nothing is known, but it also opens a way to determine a time frame within which the grammaticalization of Shumcho pluractional *-ε* may have taken place. I will briefly explore this possibility in the next section.

Whatever approach (if any) turns out to be on the right track, the fact that pluractional *-ε* does not detransitivize a transitive verb and thus can also occur with (originally or derived) intransitive verbs, whereas detransitivizing “middle” *-ε* can be applied only to transitive verbs, suggests that despite their common surface shape they are underlyingly different morphemes. Similarly, even if it is assumed that phonologically altered detransitivized forms are no longer transparent in the present-day language as deriving from the affixation of *-ε*, the fact that verbal forms detransitivized by *-ε* take subject agreement, whereas their homophonous pluractional counterparts are ungrammatical (see above [22]), shows that two different morphemes are at work here.

## 5.2 Grammaticalization—The Time Frame

If one assumes that the process of epenthetic plosive insertion followed by deaffrication is no longer productive, the fact that the suffixation of pluractional *-ε* to consonant-final stems does not bring about the morphophonological changes observed with intransitive *-ε* in the respective contexts, together with the possibility of suffixing pluractional *-ε* to verbs that have been detransitivized by intransitive *-ε* (and display these changes), may also be taken as evidence that the historical period in which these changes occurred preceded the use of *-ε* as an independent pluractional marker: it must have gained this status at a later stage, when the changes were already completed. This would allow us to determine a time frame within which the grammaticalization process is likely to have occurred.

The data in Gerard (1842, 548–51) are the oldest known recorded Shumcho data (collected at some time between 1818 and 1822). They apparently represent an older stage of the language when general deaffrication had not yet taken place (or was not yet completed), since final plosive-sibilant clusters are still intact. Table 3 contrasts the relevant entries with their modern counterparts. As can be seen, the modern counterparts of *all* of Gerard’s entries with a final sibilantic affricate have undergone deaffrication and lost the affricate’s sibilantic component.<sup>14</sup>

<sup>14</sup> One relevant entry in Gerard (1842) is missing from Table 3: *Roch* “musk deer,” by hypothesis *rot<sup>(h)</sup>* or *ro.t<sup>(h)</sup>* in modern Shumcho, is not known to my consultants.

| Historical Shumcho<br>(Gerard 1842, data ±1820) |                  | Present-day Shumcho                                     |
|---|------------------|---|
| <i>Branch</i>                                   | “finger”         | <i>brant<sup>h</sup></i>                                |
| <i>P,hoch</i>                                   | “ass”            | <i>p<sup>h</sup>o:t<sup>h</sup>, p<sup>h</sup>o:t</i>   |
| <i>Peeoots</i>                                  | “mouse”          | <i>pju:t</i>  |
| <i>Peeach</i>                                   | “bird”           | <i>pja:t</i>  |
| <i>Chuks</i>                                    | “iron”           | <i>teak<sup>h</sup></i>                                 |
| <i>K,hoolch</i>                                 | “skin for flour” | <i>k<sup>h</sup>ult<sup>h</sup></i> (ca. “leather bag”) |
| <i>Keeooch</i>                                  | “adze”           | <i>kju:t<sup>h</sup>, kju:t</i>                         |
| <i>K,hoorts</i>                                 | “knife”          | <i>k<sup>h</sup>ur<sup>h</sup>t<sup>h</sup></i>         |
| <i>Chigich</i>                                  | “small”          | <i>tsigit</i>   |
| <i>Shokshma</i>                                 | “ride”           | <i>εok<sup>h</sup>ma</i>                                |

**Table 3.** Historical Shumcho vs. present-day Shumcho: deaffrication.

Crucially, in Gerard’s list the intransitive verb “ride” appears as *Shokshma* with a final plosive-sibilant cluster in which *-sh* is the intransitive marker. The corresponding modern form is deaffricized to *εok<sup>h</sup>ma*; the form *εok<sup>(h)</sup>εma* is understood by my consultants only as the intransitive pluractional form employing the pluractional marker *-ε*.

- (31) (a) Gerard (1842):        *Shok-sh-ma* “ride”    [make.ride-INTR-INF]
- (b) Modern Shumcho:    *εok<sup>h</sup>-ma* “ride”        [make.ride.INTR-INF]
- εok<sup>(h)</sup>-ε-ma* “ride”    [make.ride.INTR-PLURACT-INF]

The fact that deaffrication of final plosive-sibilant clusters has not yet taken place in Gerard’s data and therefore also the intransitive verb *εokεma* “ride” still appears with a final affricate, just like its Kinnauri cognate *shog-shi-mig* “ride” above in footnote 9, (as opposed to the modern form *εok<sup>h</sup>ma*) would indicate that the state of affairs observed today must have arisen at a later time only and that *-ε* was not yet in use as a pluractional marker at the time of Gerard’s data (or, at least, was not yet an independent marker then).<sup>15</sup> If viewed in this way, *-ε* became an independent marker only after ±1820.

<sup>15</sup> Since Gerard (1842) is a very basic wordlist it can safely be assumed that *Shok-sh-ma* “ride” is not a pluractional intransitive form.

## 6. Conclusion—Broader Perspective

In this article I argued that the Shumcho pluractional marker *-ε* evolved from the intransitive (“middle”) marker *-ε*, and did so perhaps only in comparatively recent times. Since the discussion was based on Shumcho-internal evidence only, there arises the question about the state of affairs in related languages. The Shumcho intransitive marker *-ε* has cognates in many other West Himalayish and Tibeto-Burman languages but there seems to be next to no evidence for a pluractional marker that shares its shape with the respective sibilantic middle marker in these languages. It is not clear at present if this must be attributed to the poor state of documentation of West Himalayish languages in general (and many other Tibeto-Burman languages) or if Shumcho took a road here that was not taken by its kin. Possible exceptions are the neighboring, related languages Kinnauri and Jangrami. Bailey (1909, 666) describes the Kinnauri cognate marker *-sh(i)* as expressing “a reflexive or mutual or even passive sense.” Among the examples he gives the form *krap-shi-mig* ([weep-INTR-INF], from *krab-mig* “weep”), which he translates as “cry together (perhaps falling on each other[’s] necks).” Note that here as well an otherwise intransitivizing marker is applied to an intransitive verb (“weep”), and a pluralic subject seems required. It would therefore be interesting to know how far Kinnauri *-sh(i)* can be used productively in this way and what its properties would be. As a Shumcho equivalent, *ninpan krap-ε-u* [we.EXCL weep-PLURACT-PERF] is understood as “each of us cried.” My Jangrami field data contain forms such as *tueemin* “[both of them] wept” (from *tuen* “weep”) or *tuemin* “came” (from *tunen* “come”), about which my consultant said they can be used only with a dual or plural subject. However, there has not yet been an opportunity for in-depth investigation. Thus, better knowledge of other related languages may possibly change the picture.

## Abbreviations

|             |                   |             |               |
|-------------|-------------------|-------------|---------------|
| 1           | 1st person        | LOC         | locative      |
| 1st/2nd     | 1st/2nd person    | NEG         | negation      |
| 2           | 2nd person        | NHON        | non-honorific |
| 3           | 3rd person        | OBJ         | object        |
| AgrS        | subject agreement | PAST        | past          |
| CONV        | converb           | PERF        | perfective    |
| DAT         | dative            | PL, plur.   | plural        |
| EXCL        | exclusive         | PLURACT     | pluractional  |
| EMPH        | emphatic          | PROG        | progressive   |
| ERG         | ergative          | SG          | singular      |
| HON         | honorific         | SUBJ, subj. | subject       |
| IMPF        | imperfective      | trans.      | transitive    |
| INTR, intr. | intransitive      |             |               |

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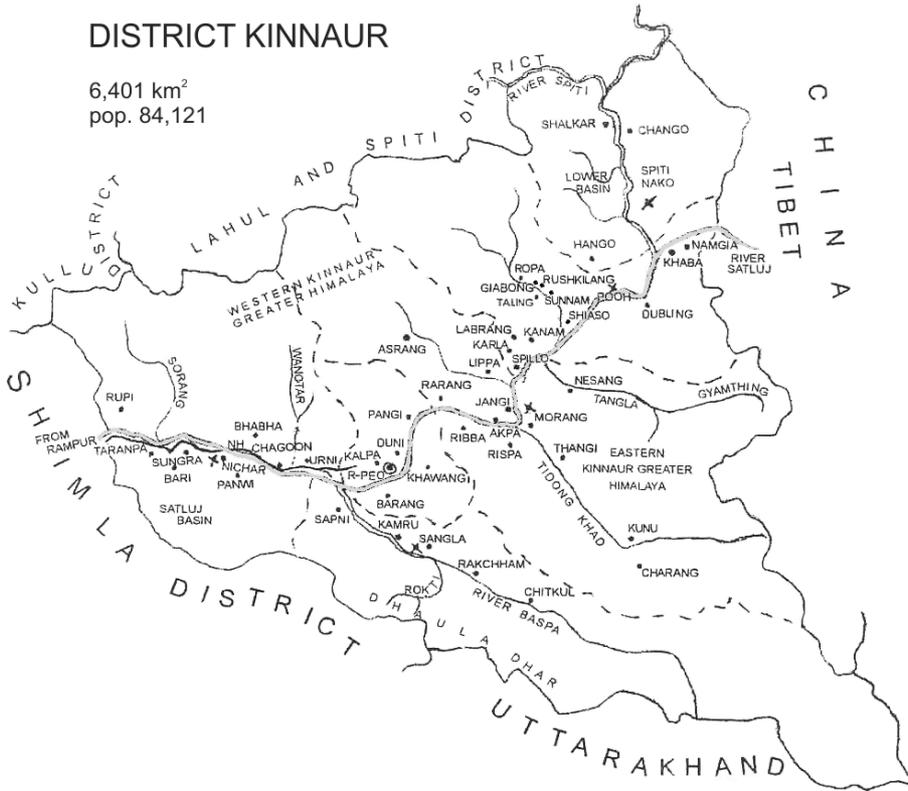
## Maps



### HIMACHAL PRADESH

#### Administrative Divisions





Map of India adapted from  
[http://commons.wikimedia.org/wiki/File:Political\\_map\\_of\\_India\\_EN.svg](http://commons.wikimedia.org/wiki/File:Political_map_of_India_EN.svg).

Map of Himachal Pradesh adapted from Sanan and Swadi (1998, 12).

Map of Kinnaur adapted from Verma (2002, xiv).



# Change in Partial Number Agreement in Greek: How and Why to Change Your Agreement in Various Ways

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**Abstract:** Early Greek allows partial number agreement between the verb and the conjoined subject in the case of both post- and pre-verbal conjoined subjects. In the case of post-verbal conjoined subjects, the verb can agree with the closest conjunct (and can be singular). In the case of pre-verbal conjoined subjects, the verb can be singular and can agree with the closest singular conjunct or with the highest conjunct in the structure (the leftmost conjunct). This possibility is lost in post-Koine Greek, and partial number agreement is attested only with post-verbal conjoined subjects. We discuss the relevant data from historical Greek (mainly Classical and Koine Greek) and we show the role of Agreement in PF and of the availability of PF movements (hyperbaton and Coordinate Structure Constraint violations) in the particular change.

**Keywords:** partial number agreement; post-verbal/pre-verbal subjects; diachrony of Greek; language change.

## 1. Introduction<sup>1</sup>

We will examine the empirical domain of conjunct-sensitive number agreement in the diachrony of Greek,<sup>2</sup> providing an account of the change in the domain of partial

1 Abbreviations: AG Ancient Greek, CG Classical Greek, KG Koine Greek, ModG Modern Greek; PA Partial Agreement, LCA Leftmost-Conjunct Agreement, RCA Rightmost-Conjunct Agreement; ConjS Conjoined Subject; ConjP Conjunct Phrase, DisjP Disjunction Phrase; VS Verb Subject order, SV Subject Verb order; sg singular, pl plural. In examples, we follow Leipzig glossing conventions.

2 We follow Marušič et al. (2007), and we do not examine the development of number and gender agreement together. Cf. Marušič et al. (2007, 224): “number agreement and gender agreement are computed *independently* by different ‘probes’ on the functional head registering values for its phi-features.”

number agreement on the basis of the operation of Agreement in PF. We will show that a corpus study of Early Greek demonstrates that partial number agreement between verb and subject is attested in Ancient Greek (AG) and Koine Greek (KG) (verb in singular number because of agreement with one conjunct and not with the whole phrase of conjoined DPs), both with post-verbal subjects (Leftmost-Conjunct Agreement, or LCA) and pre-verbal subjects (Rightmost-Conjunct Agreement, or RCA). On the other hand, partial agreement (PA) is possible in post-KG only with post-verbal subjects (only LCA). Hence, our study indicates that there are cases where ConjPs do not compute their own number: other XPs within the ConjP may be chosen for number features (we will show that this holds also for ConjPs and not only for DisjPs, for which noncomputation of number has already been argued).

RCA is a rare phenomenon for head-initial languages; Slovenian and Serbian/Croatian have been shown to exhibit RCA, but for gender (Marušič et al. 2007; see below for details). Early Greek demonstrates RCA for number, but RCA is lost in post-KG. This change could probably be related to a change of the language from head-final into head-initial. However, Slovenian and Serbian/Croatian are not head-final languages and can have RCA (PA with pre-verbal subjects) for gender, whereas ConjPs in languages that are head-final are not different from ConjPs in head-initial languages. For this reason, we will follow an Agreement in PF analysis (Benmamoun et al. 2010) and reveal the role of Coordinate Structure Constraint violations in the relevant change. AG and KG are similar to Hindi or Tsez (head-final languages), in that number PA is possible also with pre-verbal subjects (SV) and not only with post-verbal subjects (VS), and to Slovenian (a head-initial language), in that number PA in AG and KG and gender PA in Slovenian are linear (RCA with SV and LCA with VS). Nonlinear agreement with the highest conjunct (LCA with SV) is also available, in a way similar to Slovenian.

In Section 2, we present the typology of PA, which is very significant for a correct analysis of PA. Section 3 discusses the historical Greek data and shows that Early Greek has number PA with VS and SV and that there can be PA either with the closest or with the highest conjunct. In Section 4, we analyze the role that the head-initial/final parameter, the Agreement in PF, and the positions of the subject may play for a description on PA. We conclude, however, that the explanation of the particular change should be linked to a different PF aspect: the availability of PF movement (hyperbaton and Coordinate Structure Constraint violations) allows Agree in PF and PA with SV, whereas the loss of these PF movements results in loss of PA with VS. Section 5 summarizes the main findings of our study.

## 2. Conjoined Subject Agreement: Typology and Analysis

PA is a strategy employed for any phrase headed by a functional item that “does not bear its own inherent phi-features and that under particular circumstances cannot deterministically compute such values” (Marušič et al. forthcoming, 17). In

the case of PA, a verb or predicate agrees with just one of the conjoined DPs. This means that ConjPs in some cases do not compute their own number: other XPs within the ConjP may be chosen for number features. According to Doron (2000), the conjunction in Biblical Hebrew is not specified for the feature number, whereas for Bošković (2009), ConjP is not inherently specified as plural. Badecker (2007) has also argued that languages differ with respect to the number specification of ConjP.

Some languages show a type of asymmetry, allowing PA (with one conjunct) and, therefore, singular number on the verb only with post-verbal and not with pre-verbal subjects. In cases with number PA and VS and agreement with the leftmost conjunct (LCA), there is number agreement not between the verb (singular) and the conjoined subject (plural) but between the verb and the leftmost conjunct of the post-verbal conjoined subject. Our study will show that PA with pre-verbal subjects is vulnerable to change.

The full typology of languages that permit (number or gender) PA is complex and is as follows:

- (a) Languages with LCA and VS:
  - (i) Some of them disallow PA with SV. They show LCA or full agreement with VS, full agreement with SV: for instance, Moroccan and Lebanese Arabic (example [1a]).
  - (ii) A few of them allow PA with SV (RCA): Slovenian, Bantu languages (for instance, Ndebele), Serbian/Croatian, English (with disjunction; Morgan 1972, 281; Haskell and MacDonald 2005). See example (1b).

(1) (a) VS (SV is not possible) with PA; Moroccan Arabic  
 ža                    ğomar        w    karim.  
 came.3SG.M    Omar            and Karim  
 ‘‘Omar and Karim came.’’ (From Aoun et al. 1994)

(b) SV (VS is also possible) with PA; Tsez  
 kid-no                    uži-n                    Ø-ik’is  
 girl.ABS.II-and    boy.ABS.I-and    I-went  
 ‘‘A girl and a boy went.’’ (From Benmamoun et al. 2010)

Note that, according to Benmamoun et al. (2010), in Hindi but not in Tsez, PA is possible with intervening elements between the conjoined DPs and the verb, either with VS or with SV. We will see below that AG and KG follow Hindi and not Tsez in this respect.

(iii) A very few languages can also have furthest-conjunct agreement with SV as well (LCA with SV): for instance, Slovenian (for gender agreement) and Early Greek for number (see below). Greek changed from this language type, which allows PA with VS and SV and even LCA with SV, to language type (i), which allows PA only with VS. Modern Greek (ModG) shows number PA—as an option together with the option of full agreement—only with VS (Spyropoulos 2011).

(b) Languages with PA:

(i) Most languages do not permit PA with number-sensitive items, collective interpretation, or anaphor binding.

(ii) Some languages allow PA even with number-sensitive items, collective predication, and anaphor binding. Welsh is an example of such a language (moreover, PA is obligatory for ConjPs that have an initial pronoun in Welsh; Sadler 2003). Early Greek is also an example of this language type for number PA and allows PA with number-sensitive items. In example (2), the verb is in the singular number and agrees only with the first conjunct (*dauid* “David”) but not with the second conjunct or *the pronoun* (*autôn* “their”) which refers to both conjuncts.

(2) *kaì êren dauid kaì hoi ándres*  
 and raised.3SG David.NOM.SG and ART.NOM.PL man.NOM.PL  
*autoû tèn phōnēn autôn*  
 3SG.GEN.M art.acc voice.ACC 3PL.GEN.M

“Then David and the people who were with him raised their voices.” (LXX. *IKi*. 30:4)<sup>3</sup>

Earlier approaches to PA were based on a portion of the typological data and the impression that no language allows RCA with SV. Marušič et al. (2007) have shown, based on data on partial gender agreement with SV and ConjPs in Modern Slovenian as well as on number PA with SV in Modern English DisjPs, that we cannot extend the earlier analyses to capture rightmost PA: most of the previous accounts appealed to the correlation between the structure of ConjP with the first conjunct in a higher position than the second conjunct and the LCA (PA with VS). As we will see, Modern Slovenian is a language that shows many of these options for gender PA in a very similar way to the historical data from Greek on number PA: Modern Slovenian demonstrates agreement with ConjP (default masculine agreement; both

<sup>3</sup> For abbreviations of authors and works, see LSJ (Liddell-Scott-Jones Greek-English Lexicon). [http://stephanus.tlg.uci.edu/ljsj/01-authors\\_and\\_works.html](http://stephanus.tlg.uci.edu/ljsj/01-authors_and_works.html).

with VS and SV), agreement with the closest conjunct (both with VS and SV), and agreement with the highest conjunct (with SV) (Marušič et al., forthcoming); see example (3a)–(b).

- (3) (a) [Krave in teleta] so se pasli/pasla/pasle.  
 cow.F.PL and calf.N.PL aux REFL graze.M.PL/N.PL/F.PL  
 “Cows and calves grazed.” (From Marušič and Nevins 2010)
- (b) [Teleta in krave] so se pasli/pasla/pasle.  
 calf.N.PL and cow.F.PL aux REFL graze.M.PL/N.PL/F.PL  
 “Calves and cows grazed.” (From Marušič and Nevins 2010)

With regard to number agreement, Modern English DisjPs constitute a typical example of PA with SV (and VS); Cf. example (4a)–(d).

- (4) (a) [Neither that dog nor those cats] are housetrained.  
 (b) [Neither those cats nor that dog] is housetrained.  
 (c) Is [neither that dog nor those cats] housetrained?  
 (d) Are [neither those dogs not this cat] housetrained?  
 (From Marušič et al. 2007, 222)

Based on historical data from number PA in Greek, we have to modify Marušič et al.’s (2007) analysis and note that not only Modern English disjunctions but also several cases of ConjP do not compute number features.<sup>4</sup> In Section 3, we bring data from Early Greek into the discussion and show that Early Greek allows PA both with VS and SV, both with the adjacent (LCA with VS and RCA with SV) and with the highest conjunct (LCA with SV).

4 Cf. Marušič et al. (2007, 224n11): “Unlike ConjP, DisjP lacks an inherent or deterministically-computed number feature.” On the contrary, this must hold for ConjP and number in Arabic dialects, Celtic, Greek, and other languages with PA discussed in Doron (2000).

### 3. Historical Greek Data

CG is an SOV language with PA with VS and SV; higher frequency is attested for PA with VS than with SV. See (5)<sup>5</sup> and (6a–b) (cf. Lavidas [forthcoming] for details on word order in CG).<sup>6</sup>

- (5) Plato
- |                                 |    |
|---------------------------------|----|
| (i) <b>Vsg</b> ConjS1 & ConjS2  | 18 |
| (ii) ConjS1 & ConjS2 <b>Vsg</b> | 5  |
- (6) (a) enantíon            *estìn*            *ho*                    *nómos*                    *kai*  
 opposite.NOM        be.3SG            ART.NOM.SG        convention.NOM.SG        and  
  
*hē*                    *phúsis*  
 ART.NOM.SG        nature.NOM.SG  
 “Convention and nature are opposites.” (Pl. *Grg.* 489b)
- (b) blábēn                *hēdonē*                    *kai*    *lúpē*                    *gennâi*  
 mischief.ACC        pleasure.NOM.SG        and    pain.NOM.SG        generate.3SG  
 “Pleasure and pain generate mischief.” (Pl. *Ep.* 315c)

PA with VS and SV appears in the following stage of Greek, in KG, not only in the translation of the Septuagint (influenced by Biblical Hebrew) or the Biblical Greek of the New Testament but also in non-Biblical and non-translation texts of Polybius; see (7) and (8). Word order in KG, however, is different from that in AG: the unmarked word orders of KG are VSO and SVO instead of SOV (and SVO), which are the unmarked word orders of CG (Kirk 2012; Lavidas, forthcoming).

- (7) (a) Septuagint
- |                                    |   |
|------------------------------------|---|
| (i) <b>Vsg</b> ConjS1 & ConjS2     | 9 |
| (ii)    ConjS1 & ConjS2 <b>Vsg</b> | 7 |

5 In our corpus study, to which we refer here, we have collected no other examples than those with a verb (in the indicative mood, present tense) and a conjoined subject without any intervening element of any type (e.g., object, adverb, PP).

6 Moreover, VS orders in CG can also have a verb in dual number in the case of full agreement. An instance of nonagreement in CG, different from PA, is also the case of singular verbs with neuter plural (nonconjoined) nouns. The correlation between the neuter plural nouns that can coappear with singular verbs and the conjoined subjects with PA remains open for further research.

## (b) New Testament

- (i) **Vsg** ConjS1 & ConjS2 15<sup>7</sup>  
(ii) ConjS1 & ConjS2 **Vsg** 4

## (c) Polybius

- (i) **Vsg** ConjS1 & ConjS2 3  
(ii) ConjS1 & ConjS2 **Vsg** 9

- (8) (a) τί *dúnatai* *proáiresis* *kalokagathikḗ*  
what.ACC be-able.3SG goodwill.NOM.SG honorable.NOM.SG  
*kai* *pístis*  
and faith.NOM.SG  
“(about) what honorable goodwill and faith are able (to achieve).” (Plb. 7.11.9)

- (b) euthéōs *diaphorà* *kai* *stásis* *egennâto*  
at-once disagreement.NOM.SG and sedition.NOM.SG began.3SG  
“Disagreement and sedition at once began to manifest themselves.” (Plb. 1.67.2)

The verb agrees with the closest conjunct, the leftmost conjunct in the case of VS, and constructions such as the one in example (9a) are therefore attested in the corpus: Vsg ConjS1sg & ConjS2pl. In example (9b), we observe a very significant example with agreement with the furthest ConjS1: the verb agrees with the pre-verbal leftmost subject.

- (9) (a) Kai *exêlthen* *ho* *Iēsoûs* *kai*  
and went-forth.3SG ART.NOM.SG and Jesus.NOM.SG and  
*hoi* *mathētai* *autoû*  
ART.NOM.PL disciples.NOM.PL 3SG.GEN.M  
“‘And Jesus and his disciples went forth.’” (Ev.Marc. 8:27)

<sup>7</sup> But there is the case of one sentence (example i) that appears in seven different passages in the New Testament.

- (i) *ekeî* *éstai* *ho* *klauthmòs* *kai* *ho*  
there be.3SG.FUT ART.NOM.SG weeping.NOM.SG and ART.NOM.SG  
*brugmòs* *tôn* *odóntōn*  
gnashing.NOM.SG art.gen.pl tooth.GEN.PL  
“‘There will be weeping and gnashing of teeth in that place.’” (for instance: Ev.Luc. 13: 28)

- (b) *ékstasis*                      *kai*                      *phriktà*                      *egenéthē*                      *epi*  
 astonishment.NOM.SG    and                      shocking.NOM.PL                      happened.3SG                      in  
  
*tês*                      *gês*  
 ART.GEN                      land  
 “Astonishment and shocking things happened in the land.” (LXX. *Je.* 5:30)

The following generalizations can be stated for PA in Early Greek (Pre-KG and KG) (let us recall here that PA, even when it is allowed, is an optional characteristic).

(i) Most of the PA examples are attested with abstract, [−animate], [+3rd-person] nouns. Although almost all examples include 3rd-person conjoined subjects, there are very rare examples of 2nd person.<sup>8</sup>

(ii) VS orders can appear with PA and ConjS1sg, ConjS2pl; VS orders are also attested with PA and ConjS1sg, ConjS2sg. It is notable that the construction Vsg ConjS1pl & ConjS2pl is not attested. Long distance is possible between the first and second conjuncts in many cases—but it is not a requirement for PA.

(iii) Many examples of RCA with SV arise with the verb “be.” All of the pre-verbal conjoined subjects with PA are 3rd-person singular nouns, whereas many examples contain proper nouns. Abstract nouns are also frequent in the examples with PA and SV.

(iv) With regard to number full agreement, most of the SV cases (in our corpus study with no intervening element) are with a plural ConjS1. Most of the examples with VS and full agreement have plural ConjS1 and plural ConjS2. One of the conjuncts can be in singular number in the case of full agreement, and this conjunct can appear as the closest to the verb conjunct but only with SV (the rightmost conjunct) and not with VS; this shows that PA could be a necessary condition with VS in the case of nonintervening elements between V and S.

VS continues to permit PA (LCA) in later Greek (post-KG), but SV does not. Greek changed from a “Hindi” type of language—a verb-final language with PA with VS and SV—into a “Moroccan Arabic” type of language—a verb-initial language with

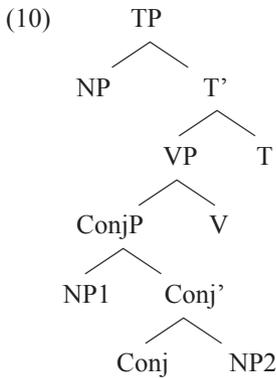
8 Cf. (ii).

- (ii) *ou*                      *poiêseis*                      *en*                      *autêi*                      *pân*                      *érgon*                      *sù*                      *kai*  
 NEG                      do.2SG                      on                      it                      any.ACC                      work.ACC                      2SG.NOM                      and  
  
*hoi*                      *huioi*                      *sou*                      *kai*                      *hē*                      *thugatēr*  
 ART.NOM.PL                      son.NOM.PL                      2SG.GEN                      and                      ART.NOM.SG                      daughter.NOM.SG  
  
*sou*                      *ho*                      *paîs*                      *sou*                      *kai*                      *hē*  
 2SG.GEN                      ART.NOM.SG                      male-servant.NOM.SG                      2SG.GEN                      and                      ART.NOM.SG  
  
*paidiskē*                      *sou*  
 female-servant.NOM.SG                      2SG.GEN  
 “On it, you or your sons or your daughter or your male servant or your female servant shall not do any work.” (LXX. *De.* 5:14)

PA only with VS. Accordingly, the head-final and head-initial question would be of significance.<sup>9</sup> In Section 4, we discuss possible explanations of the change, including the question of the role of the head-initial/final parameter.

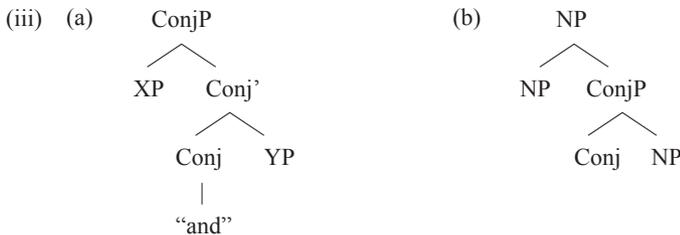
#### 4. Explaining the Change: From PA with VS and SV to PA with VS

The question that arises is whether the loss of PA with SV in later Greek (post-KG) is a result of a change from head-final to head-initial. Modern head-final languages demonstrate instances of PA (RCA) with SV. However, the answer to this question should be in any case negative, mainly because ConjPs do not differ in head-initial and head-final languages (Benmamoun et al. 2010). Even if we consider pre-KG to be a head(verb)-final language, the left conjunct is in a higher position than the right conjunct in head-final languages, as shown in Benmamoun et al. (2010), similar to head-initial languages; see (10).<sup>10</sup>



9 See Taylor (1994), who has analyzed the development of Greek word order as reflecting a change of a language from verb-final to verb-initial.

10 There is a general consensus within the P&P approach and the Minimalist Program that the ConjP is an asymmetric structure with a single head. For most approaches, conjunction is the head of the phrase; see (iiia). For Munn (1999), the head of the conjoined DPs is the first DP conjunct, whereas the second DP is an adjunct; see (iiib).



Accordingly, ConjPs are the same in AG and KG, and ModG. Coordination has an asymmetric structure, and the leftmost element is structurally higher in AG and KG. The relevant evidence comes from: (a) Binding (Munn 1999); see (11), where the first conjunct appears to be in a higher position than is the second conjunct. (b) Extraposition; the conjunction and the rightmost conjunct can be extraposed after the verb in Early Greek—as they can in head-initial languages. See (12a)–(b). Constructions such as (12a’), (12a’), (12b’), and (12b’’) are unattested in Early Greek.

- (11) Adōnias kai pantes hoi  
 Adonijah.NOM.SG and all.NOM.PL ART.NOM.PL  
 klētoi autoū  
 guests.NOM.PL 3SG.GEN.M  
 “Adonijah and all his guests” (LXX. *IKi*. 1:41)

- (12) (a) *eis pūr autòn ébalen kai*  
 into fire.ACC.SG 3SG.ACC threw.3SG and  
*eis húdata*  
 into water.ACC.PL

(a’) \**eis pūr autòn ébalen eis húdata kai*

(a’’) \**eis pūr autòn kai ébalen eis húdata*

“(It) has thrown him into fire or water (to kill him).” (Ev.Marc. 9:22)

- (b) *ho oinos apóllutai kai*  
 ART.NOM.SG wine.NOM.SG be-ruined.3SG and  
*hoi askoí*  
 ART.NOM.PL wineskin.NOM.PL

(b’) \**ho oinos apóllutai hoi askoí kai*

(b’’) \**ho oinos kai apóllutai hoi askoí*

“The wine and the wineskins will be ruined.” (Ev.Marc. 2:22)

Therefore, since the ConjPs are similar in both head-final and head-initial languages, we cannot claim that AG or KG has PA with SV because of the head-final characteristics of the language of the period.

For this reason, we follow Benmamoun et al.’s (2010) approach, according to which not only is the ConjP targeted by Agree for agreement with T (+V), but also linear adjacency determines in PF what part of the ConjP will spell-out the

agreement features. For this approach, Agree establishes the relation with ConjP in Syntax, but adjacency can favor the most adjacent conjunct in PF, when the agreement features are spelled-out.<sup>11</sup> This approach manages to explain in a similar way PA as it appears both in head-final (for instance, in Hindi and Tsez) [with VS and SV] and in head-initial languages (for instance, in Moroccan Arabic and Lebanese Arabic) [with VS].

The data from Early Greek, however, have presented cases with SV and LCA; for this reason, we have to claim that PF respects linear adjacency, but not always (and this claim holds for examples with SV as well). PF in reality chooses the conjunct with which there will be agreement: the conjunct chosen by PF is usually the adjacent conjunct, but this does not mean that there is no access to the furthest but highest-in-structure conjunct. Hence, Agree in Syntax takes place with the whole ConjP—and not with parts of the ConjP. The agreement is satisfied in PF with the spell-out of the features, which can be *optionally* affected by linear adjacency (Benmamoun et al. 2010). The data from historical Greek support this approach to agreement, together with the fact that adjacency is not the only crucial factor, but access both to adjacent and to highest members of the phrase (ConjP) is possible with agreement in PF. First, in the Syntax, the agreement relationship between the verb and the conjoined DPs is established. Then, in PF, this agreement relationship is satisfied with spell-out of the features of either the whole ConjP or the linearly closest conjunct or the highest conjunct in the hierarchy (first in linear order, ConjS1) even with SV—but never of the rightmost ConjS2 with VS; see (13a)–(d). ConjS2 with VS is neither the closest nor the highest conjunct, and it is for this reason that we could not have the construction Vsg-ConjS1pl & ConjS2sg.

- (13) (a) ConjS1sg & ConjS2pl Vsg  
 (b) ConjS1pl & ConjS2sg Vsg  
 (c) Vsg ConjS1sg & ConjS2pl  
 (d) \*Vsg ConjS1pl & ConjS2sg

The questions that arise are why, in ModG, adjacency in PF affects the spell-out of agreement features only with VS, and why and how the shift can happen from a language that allows PA with VS and SV to a language that allows PA only with VS. Of

11 Analyses similar to that of Benmamoun et al. (2010) include Bhatt and Walkow's (2013) proposal: for them, Agree again appears in two steps: (a) Agree-Link, based on hierarchy and establishing a Probe-Goal relationship, and (b) Agree-Copy, which retrieves the values to be copied onto the Probe after Agree-Link.

course, even if we accept that PF is the location of the variation between Early Greek, which allows linear adjacency to play a role in PA in cases of SV, and post-KG, which does not allow linear adjacency to play a role in cases of SV, the question remains of the reason for the change. That is, the question is why the change happened from AG and KG number PA into post-KG number PA.

Doron (2000) has argued that LCA is possible because T does not attract DP in the type of languages with VSO clauses. For Doron, in Biblical Hebrew, full agreement is attested if ConjS appears in Spec, TP and V is beyond TP (to have the order VS) and preceded by some other element (XVS). In addition to Doron's remarks, however, in Biblical Hebrew, PA can also appear with SV (Revell 1993; Holmstedt 2009). Accordingly (see Lavidas, forthcoming), agreement and nonagreement in Biblical Hebrew appear to depend solely on the position of the subject: there is full agreement if the subject is in Spec, TP, and V can be in C, resulting in VS, or V can be in T, resulting in SV. There could be PA if the subject is not in Spec, TP; if the subject is in dV (V-domain) and V is in T or C, the result is a VS order. If the subject is in dC (C-domain) and V is in T or C, the result is a SV order. Badecker (2007) has also argued, for Moroccan and Lebanese Arabic, that the position of the subject is related to PA; for him, PA with SV is not allowed in these languages because a DP in Spec, CP must bear an index (indices for Badecker's OT analysis are responsible for agreement).

Nevertheless, this correlation between the position of the subject and full agreement or PA cannot explain the particular change (from PA with VS and SV to PA only with VS) because the subject can appear in positions other than Spec, TP in ModG, and PA is impossible with SV in ModG. Thus, though the above claim that modifies Doron's analysis can successfully describe the facts for Early Greek, it does not explain the particular change.

Two remarks, based on Benmamoun et al.'s (2010) discussion of Moroccan Arabic, can show an alternative way of explaining the change: (a) It appears that, in ModG, in PF, the agreeing head "re-brackets" only with the elements to the right, because ModG is a head-initial language and VS in the basic/neutral order. (b) Indeed, as claimed by Benmamoun et al. (2010), the pattern of PA "tracks" the head parameter of the languages. We observe that any pattern that does not track the head parameter is marked and vulnerable to be lost. For head-final languages, however, PA is available for both SV and VS and not only for SV orders, a fact that needs further explanation.

On the other hand, Bošković (2009) has argued that the availability of Coordinate Structure Constraint violations (which is based on left-branch extraction) can be a possible reason for the differences between languages with and without RCA. For him, in head-initial languages that do not allow RCA, when there is movement of the subject, the agreement is plural because these languages do not allow Coordinate Structure Constraint violations (Ross 1967). In these languages, the ConjS1 cannot undergo

movement (pied-piping to Spec, IP) and cannot value the N-features of I (Bošković 2009); this fact must result in plural (full) agreement.<sup>12</sup>

CG shows many examples of hyperbaton: that is, cases of displacement and discontinuous constituents. CG hyperbaton does not respect syntactic islands and is a PF movement (Agbayani and Golston 2010). This PF movement appears to be related to the change in another PF phenomenon, in the phenomenon under examination: Agreement of ConjPs in PF resulting in cases of PA. For our question, the most significant case of violation of syntactic islands in CG is the one that shows extraction out of coordinate (conjoined or disjuncted) phrases; see example (14). We should note that, according to Agbayani and Golston (2010), hyperbaton in CG is common and shows “insensitivity” to the Coordinate Structure Constraint; see (15).<sup>13</sup>

(14) hyperbaton around a preposition

|               |       |     |             |
|---------------|-------|-----|-------------|
| aretês        | péri  | kai | kakías      |
| virtue.GEN.SG | about | and | vice.GEN.SG |

“about virtue and vice” (Pl. *R.* 365a) (From Agbayani and Golston 2010, 143)

(15) ho                    khrónos                    gâr    kai                    hē  
 ART.NOM.SG            time.NOM.SG            PRT    and                    ART.NOM.SG

empeiria                tà                            mē    kalôs                    ékhonta  
 experience.NOM.SG    ART.ACC.PL            NEG    well                    have.PTCP.ACC.PL

didáskei                toûs                            anthrópous  
 teach.3SG              ART.ACC.PL                people.ACC.PL

“Because time and experience teach people what is not good.” (Antiphon. *Choreutes.* 2.5) (From Agbayani and Golston 2010, 147)

Following this argument, it appears that the availability of displacement and discontinuous constituents, the availability of such PF movements, and the loss of this availability are connected to the change from Early Greek PA with VS and SV to post-KG PA only with VS. The changes in the position of the subject or the change from verb-final to verb-initial are absolutely correlated to PA but do not appear to form the basis of the particular change.

12 For Bošković, this can happen because plural is the semantically default number (Sauerland 2003), or, alternatively, because movement is compatible only with a null pronoun structure and the null pronoun takes ConjP as its complement, which can yield plural agreement only.

13 See also another case of ConjP with movement in AG: ConjS1sg Vpl & ConjS2sg (“schema Alcmanicum”). Cf. (iv), for instance.

(iv) thársos                moi                    Árēs                    t'                    édosan                kai                    Athēnē  
 courage.ACC.SG        1SG.DAT            Ares.NOM.SG        and                    gave.3PL            and                    Athena.NOM.SG

“Ares and Athena gave me courage.” (Hom. *Od.* 14.216)

## 5. Conclusion

Early Greek demonstrates partial number agreement between verb and subject with both VS (LCA) and SV (RCA), whereas partial number agreement is possible in post-KG only with VS. We have excluded an explanation of this change that is based on transition from a language with head-final characteristics to a language with head-initial characteristics, mainly because ConjPs have the same structure in both head-initial and head-final languages. Similarly, the positions of the subject can be included in a description of the characteristics of the partial number agreement but do not account for the change; the subject can appear in positions other than in Spec, TP in both pre- and post-KG. On the other hand, the role of PF appears to be central in this change: Agree in PF allows verbs to agree with the closest conjunct, whereas the availability of PF movements (resulting in hyperbaton and Coordinate Structure Constraint violations) is correlated to the possibility of PA with SV.

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# Linkers Are Not “Possession Markers” (but “Agreements”)

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**Abstract:** The empirical focus of this work is linkers in Albanian, Aromanian, and Iranian (Persian and Kurdish ezafes). We argue that linkers (at least in the languages considered) are neither copulas nor case assigners, but they are closer to what is usually called agreement. Specifically, the parallel is with the clitic pronouns/determiners of the Romance languages, which are also known to enter agreement (aka doubling) structures. We argue that so-called agreement morphology is interpretable as a partial saturation of argument slots. A cross-linguistic survey of determiners, linkers, and pronominal clitics based on this view is provided; we briefly extend our discussion to pre-genitival linkers, treating genitive case as a lexicalization of the part-whole relation, of which the linker saturates the external argument (the *possessum*).

**Keywords:** linkers; agreement; case; Albanian; Iranian.

## 1. Introduction

In many languages a linker element is inserted between a noun N and an adjective or a complement of N (or a relative clause, not considered here because of its internal complexity). The linker often agrees with the head noun, as shown in (1) and (2) for Kurmanji Kurdish (Bahdînî dialect).

- (1) (a) kurk-(ak-)e:            mazən    jet        het            *Kurmanji*  
          boy-(one)-LNK.M    big        m.sg    come.3SG  
          “A/The big boy is coming.”
- (b) ketʃk-(ak-)a:        mazən    jət        het  
          girl-(one)-LNK.F    big        f.sg    come.3SG  
          “A/The big girl is coming.”

- (c) kurk-e:t/ketʃk-e:t          mazən    jet    hen  
 boy-LNK.PL/girl-LNK.PL    big    pl    come.3SG  
 "The big boys/girls are coming."

- (2) dest-e          kurk-i/ ketʃk-e  
 hand-LNK.M    boy-OBL.M/girl-OBL.F  
 "The hand of the boy/girl."

There is still no general consensus in the literature regarding the nature (and inventories) of linkers. For instance den Dikken and Singhapreecha (2004, n31) explicitly exclude Greek polydefiniteness from their notion of linkers, while Androutopoulou and Español-Echevarría (2007) start from Greek in their survey, and Larson and Yamakido (2008) also include Greek in theirs. As in Greek, in Albanian,<sup>1</sup> pre-adjectival and pre-genitival articles are related to definite inflection (aka post-nominal articles) with which they agree and also often coincide, as shown in (3)–(4).

- (3) (a) ερθ          diaλ-i          i          maθ    Arbëresh-Vena  
 came    boy-NOM.M.DEF    the.M    big  
 "The big boy came."

- (b) ερθ          vazd-a          ε          mað-ε  
 came    girl-NOM.F.DEF    the.F    big-F  
 "The big girl came."

- (c) ερθə          kriatura-tə          tə          mbiðεn-a  
 came    boy-NOM.PL.DEF    the.PL    big-PL  
 "The big boys came."

- (4) (a) ku'tu    å    biʃt-i          i          matʃε-sə  
 here    is    tail-NOM.M.DEF    the.M    cat-OBL.F.DEF  
 "Here there is the tail of the cat."

- (b) kʝə    å    kəmb-a          ε          matʃε-sə  
 this    is    leg-NOM.F.DEF    the.F    cat-OBL.F.DEF  
 "This is the leg of the cat."

<sup>1</sup> Albanian data are mainly from the Italo-Albanian (Arbëresh) variety of Vena di Maida (Calabria). Data concerning Standard Albanian, taken from Turano (2004), are used for comparison. In the text we will generically speak of Albanian; the source of data will be indicated in the examples.

- (c) ερḏə kriatura-tə tə mbiðeɲ-a  
 came boy-NOM.PL.DEF the.PL big-PL  
 “The big boys came.”

In this work we will first show that on the basis of morphological, syntactic, and interpretive evidence, Kurdish *ezafes* and Albanian articles belong to the same class of linkers. Furthermore, currently available formal theories of linkers (as copulas, as case assigners/possessor markers, as means for identity avoidance) face problems when applied to both Albanian and Kurdish.

Our proposal is consistent with Zwart’s (2006) and Philip’s (2012) claim that the difference between so-called linkers and so-called agreement reduces to their structural position (head vs. inflection). However, for Philip (2012) linkers are “semantically vacuous functional heads”—and she extends linker status to a whole series of functional heads, including at least complementizers, prepositions like *of* or *to*, and coordinations as well as linkers proper. Here, on the contrary, we take the view that both lexical and functional elements, including morphemes, externalize (Berwick and Chomsky 2011) interpretive content and that they both concur to project interpreted (meaningful) syntactic relations.

## 2. What Linkers Are Not

In this section we provide arguments as to why currently available formal theories of linkers—as copulas, as case assigners, as means for identity avoidance—face problems when applied to Albanian or Kurdish.

The obvious counterargument to treating the linker as a copula is that in Albanian (5) the copula is independently lexicalized in front of the sequence article—predicative adjective. Similarly in Bahdîni Kurmanji the linker *je(t)/ja*: precedes the sequence adjective—enclitic copula, as in (6).

- (5) (a) eʃt \*(i) maθə/ \*(e) mað-ε *Arbëresh-Vëna*  
 s/he.is the.M big/ the.F big-F  
 “S/he is big.”

- (b) jan \*(tə) traʃ-a  
 they.are the.PL fat-PL  
 “They are fat.”

- (6) (a) av kamis-a jet ʃiʃti-na *Kurmanji*  
 dem.PL shirt-PL EZ.PL washed-are  
 “These shirts are washed.”

(b) au    **je/ja**        mazən-e  
 3sg    EZ.M/EZ.F    big-is  
 “S/he is big.”

(c) au    **jet**        sur-ən  
 3pl    EZ.PL    red-are  
 “They are red.”

For Larson and Yamakido (2008; cf. Samiian [1994] on Persian) linkers are necessary to case licence +N complements of N heads, including adjectives. Yet in Albanian (7a) the article replicates exactly the oblique inflection of the head noun. Why would the article solve any problem with +N embedding that the nominal inflection could not itself solve? Another line of work takes linkers to semantically license the possession relation (Koontz-Garboden and Francez [2010] on Ulwa). Here the problem posed by Albanian is another. The second internal argument of ditransitives has been connected to possessives at least since Kayne (1984). For instance the English sentence *He gave a fright/a book to everybody* corresponds to the attribution of a mental state or a material possession to the dative argument. In (7b) the oblique case morphology of Albanian is perfectly sufficient to support the possession relation in a dative context—why would it not do exactly that in a genitive context?

(7) (a) vajz-ës        së    bukur        *Standard Albanian*  
 girl-OBL.F.DEF    the    nice  
 “To the nice girl.”

(b) ja                dhe    vajz-ës  
 it-to.him/her    I.gave    girl-OBL.F.DEF  
 “I gave it to him/her.”

Similarly, in several West Iranian languages, including Kurmanji, a direct vs. oblique case distinction is morphologically available, and the possessor is marked oblique both in a genitive and in a dative context, as in (8); still the *ezafe* is present in front of the genitive.

(8) (a) dest-e        kurk-i/ ketfjk-e        *Kurmanji*  
 hand-EZ.M    boy-OBL.M/girl-OBL.F  
 “the hand of the boy/girl”

(b) de            qalam-ak-i    dama    ketfjk-e/kurk-i  
 PROGR    pen-one-OBL    give.1SG    girl-OBL.F/boy-OBL.M  
 “I give a pen to the girl/boy.”

A final family of accounts for linkers takes them to be means for identity avoidance (Ghomeshi [1997] on Persian; Richards 2010). However, in Albanian, there is a subclass of nouns—kinship terms—that are accompanied by preposed articles, in addition to their normal definiteness inflections (postposed articles). When kinship terms are embedded as genitives, structures of the type in (9) are created, where the inflected kinship term is preceded by its own agreeing article, which is preceded in turn by the pre-genitival article agreeing with the head noun. The existence of syncretisms in the nominal inflection/article paradigms leads to sequences of not only syntactically, but also morpho-phonologically identical elements. In other words far from avoiding local identity, the linkers system seems to create it.

- (9) mōra kuputsə-tə tə tə nipi-tə *Arbëresh-Vëna*  
 I.took shoes-ACC.PL.DEF the-ACC.PL the-OBL grandchild-OBL.M.DEF  
 “I took the shoes of the/his/her/their grandchild.”

### 3. A Characterization of Linkers

Albanian linkers can either be sensitive to phi-features, as in (10), or to a more complex set of features including definiteness and case, as in (11)–(12).

- (10) Pre-adjectival article in *Vëna*

|      |    |
|------|----|
| SG.M | i  |
| SG.F | ε  |
| PL   | tə |

- (11) Article with definite head noun in *Albanian*

Pre-genitival article with definite head noun in *Vëna*

|     | SG.M | SG.F      | PL       |
|-----|------|-----------|----------|
| NOM | i    | ε         | ε/tə (V) |
| ACC | ε    | ε         | ε/tə (V) |
| OBL | tə   | sə/tə (V) | tə       |

- (12) Article with indefinite head noun in *Albanian*

Pre-genitival article with indefinite head noun in *Vëna*

|     | SG.M     | SG.F     | PL |
|-----|----------|----------|----|
| NOM | i/tə (V) | ε/tə (V) | tə |
| ACC | tə       | tə       | tə |
| OBL | tə       | tə       | tə |

The variation internal to Iranian languages follows the same parameters as the variation between Albanian dialects in (10)–(12). Thus in Kurmanji (3)–(4), the linker has three

realizations namely *e* for the masculine, *a* for the feminine and *et* for the plural, as in *Vena*'s (10). However, in Hawrami Kurdish (Holmberg and Odden 2008), the adjectival *ezafe* has different realizations, *-i*, *-æ*, *-e*, depending on the number and definiteness of the head noun, recalling Albanian (11)–(12). At the same time, Hawrami Kurdish distinguishes the adjectival *ezafe* from the genitival one, since the latter takes the invariable *-u* form; this is reminiscent of the split found in *Vena* between the pre-adjectival paradigm in (10) and the pre-genitival one in (11)–(12). Comparison between Albanian and Iranian varieties confirms then that the article and the *ezafe* have essentially the same morphological make-up, down to fine parametrization.

When it comes to constituency, the Albanian article that appears in front of the adjective or the genitive DP and after the copula in (5) must be part of the structure of the AP/DP, as in (13). For the time being, we make no commitment to the category label of the “article.”

(13) [ $\epsilon$  [<sub>A</sub> mað- $\epsilon$ ]]

The Persian and Kurdish *ezafe*, despite conventional orthography, also forms a constituent with the following adjective or genitive DP. One argument in favor of these structures is that in sequences of more than one modifier, modifiers internal to the sequence are associated with an *ezafe* enclitic, which is absent from the last modifier. If the *ezafe* forms a constituent with the following modifier, as indicated by our brackets in (14), the last modifier of the sequence is correctly predicted to be *ezafe*-free (Yamakido 2005, 121).

- (14) (a) kitêb-ek-[e bas-[e nû]] *Kurmanji*  
 book-INDEF-EZ good-EZ new  
 “a good new book”
- (b) xani-yek-[î bas-[î nû]]  
 house-INDEF-EZ good-EZ new  
 “a good new house”

In recent work, Philip (2012, 37ff.) shows that in Persian, when the head noun is a coordination, there can only be one *ezafe*, next to the modifier. In other words, the *ezafe* is an integral part of the modifier; otherwise we might expect to find a copy of the *ezafe* after each conjunct. Hence, in Iranian adjectival modifiers have exactly the same structure as in Albanian, as in (16).<sup>2</sup> The categorial signature of the “*ezafe*” is once again left open.

2 Thus we claim that the only difference between Albanian and Kurdish is that Albanian articles are prosodically proclitic, while Kurdish *ezafe*s are prosodically enclitic. The same holds for pre-genitival linkers, as in Albanian (39) vs. Kurdish (40). In other words, Kurdish A/N-*e* end up as “one . . . item” (in the words of an anonymous reviewer), only if by the latter we mean

- (15) [kolâh(\*-e) va lebâs][-e Maryam] *Persian* (Philip 2012)  
 hat-EZ and dress-EZ Maryam  
 “Maryam’s hat and dress.”

- (16) [kurkak] [e: [A mazən]]

It remains for us to provide a categorial label for the linker. In Standard Albanian (7), we saw that the (non-syncretic) feminine singular oblique *së* occurs both as the pre-AP/DP article and as a nominal inflection. Crucially, as a nominal inflection, *së* is always interpreted as definite, cf. (17). The same is true of the other syllabic article of Albanian, *të*, which only occurs as a definite inflection/post-nominal article.

- |      |     |                           |     |                          |                 |
|------|-----|---------------------------|-----|--------------------------|-----------------|
| (17) | (a) | “the good boy”            | (b) | “the good girl”          | <i>Albanian</i> |
|      | NOM | <i>djal-i i mirë</i>      |     | <i>vajz-a e mirë</i>     |                 |
|      | ACC | <i>djali-n e mirë</i>     |     | <i>vajz-a e mirë</i>     |                 |
|      | OBL | <i>djali-t të mirë</i>    |     | <i>vajzë-s së mirë</i>   |                 |
|      | (c) | “a good boy”              | (d) | “a good girl”            |                 |
|      | NOM | <i>një djalë i mirë</i>   |     | <i>një vajzë e mirë</i>  |                 |
|      | ACC | <i>një djalë të mirë</i>  |     | <i>një vajzë të mirë</i> |                 |
|      | OBL | <i>një djal-i të mirë</i> |     | <i>një vajzë të mirë</i> |                 |

The pre-adjectival/pre-genitival article set also overlaps with the pronominal object clitic set which includes *i* (oblique singular “to him/her” and accusative plural “them”) and *e/ë* (accusative singular “him/her”), as in (18).

- (18)  $\epsilon$  pɛ (vazdə-nə  $\epsilon$  vɔgiʎə) *Arbëresh–Vena*  
 her I.saw girl-ACC the small  
 “I saw her (the small girl).”

The Persian *ezafe* is often characterized in the literature as semantically vacuous. Despite this, the so-called *ezafe* in Kurmanji Kurdish can occur independently of a head noun in a demonstrative/anaphoric “function,” compatible with a D categorization, as in (19).

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a prosodic word; the same holds of Albanian Art-A/N. Since prosody (and its relation to syntax and the lexicon) is outside the scope of the present work, the relevant differences are taken to hold by stipulation.

(19) (a) **yê** Soro/min/te *Kurmanji* (Haig 2011, 367)  
 EZ.M Soro/me/you  
 “The one of Soros/of mine/of yours.”

(b) **yê** dwē . . . **yê** sēye  
 EZ.M second . . . EZ.M third  
 “the second one . . . the third one”

Aromanian<sup>3</sup> pre-adjectival linkers are excluded in contexts with an indefinite noun, making them more similar to Greek polydefiniteness. What we are interested in is that in Aromanian the linker takes the full form of the demonstrative, as in (20).

(20) ar vənit/ am vəzut *Aromanian*  
 has come/I.have seen

(a) fitʃor-u (a)tse-**u** mar-**u**  
 the boy that-M big-M

(b) fət-a ats-**ε** mar-**ε**  
 the girl that-F big-F

(c) un fitʃor mari/ un fətə mari  
 a boy big/a girl big  
 “There has come/I have seen the big boy/the big girl/a big boy/a big girl.”

Given the above data, we assign the D category to the linker head as in (21)–(22). In the same way, we assign the D category to the object clitic  $\epsilon$  in (18), as well as to the definite inflections  $t\check{e}$ ,  $s\check{e}$  in (17).

(21) [<sub>D</sub>  $\epsilon$  [<sub>A</sub> mað- $\epsilon$ ]]

(22) [kurkak] [<sub>D</sub>  $\epsilon$ : [<sub>A</sub> mazən]]

#### 4. Linkers and Agreement

In German the adjective occurs in a bare (uninflected) form in predicative contexts. When a complex nominal is formed, whereby “man” is modified by “young,” the pre-

<sup>3</sup> Aromanian data have been obtained through field investigations in South Albania, where Aromanian communities are present (cf. Manzini and Savoia 2013).

nominal adjective is obligatorily inflected, as in (23). This is called agreement, and is furthermore sensitive to the (in)definiteness properties of the head noun. The Iranian *ezafe*/Albanian article and adjectival agreement in German form a natural class in more than one respect (DP-internal only, as in standard Persian, definiteness sensitive, as in Albanian or Hawrami Kurdish).

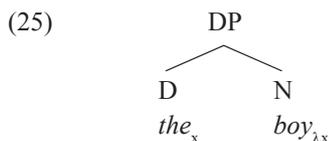
- (23) (a) *der Mann ist jung German*  
           the man is young
- (b) *der jung-e Mann*  
           the young-AGR man
- (c) *ein jung-er Mann*  
           a young-AGR man

In Albanian, Iranian, and Aromanian, linkers are Ds, on the evidence of their also occurring as determiners/demonstratives or as stand-alone pronominal clitics. In fact, definite reference and so-called agreement are carried out by the same lexical items across many languages and structures. For instance, many Romance languages also have clitics with dedicated *l-* morphology, which occur as referring pronouns and determiners, but also as agreement elements, for instance in Italian clitic left dislocation in (24).

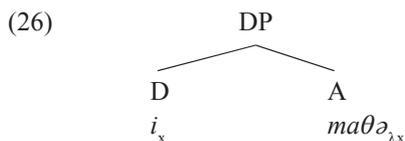
- (24) *La ragazza bionda la vedo Italian*  
       the girl blonde her I.see  
       ‘‘The blonde girl, I see (her).’’

All of this raises the question as to the relation between linkers and agreement—and of the relation between both and pronouns/determiners. Philip (2012) unifies linkers with agreement inflection on predicates, treating both as uninterpretable. However, this forces her to diverge from a standard tenet of minimalism, namely that heads are always interpretable (unlike inflection), since their deletion at LF under Full Interpretation would amount to the destruction of structure (contravening Inclusiveness, cf. Chomsky 1995).

We propose that linkers and agreement have largely identical properties including interpretive ones. We assume that non-eventive nouns are predicates and have an argumental slot (called the R-role) as standard in the literature (Higginbotham 1985; Williams 1994). The saturation of the R-role in English requires a Determiner, as schematically indicated in (25).



If we mechanically apply the analysis of the English D in (25) to the Albanian linker D, we obtain a structure of the type in (26).



This is not to say that the two Ds in (25)–(26) can really be equated (cf. Lekakou and Szendrői 2012). In English, D precedes some quantifiers, as in *the three/many/few children*, and is in complementary distribution with others, as in *the/every/no child*. On the contrary, in Albanian, elements quantifying over the adjective precede D, as in (27).

- (27)  $\text{vʃt}$   $\text{mə/ʃum}$   $\epsilon$   $\text{maðe}$  *Arbëresh–Vëna*  
 is more/much the big  
 “She is bigger/very big.”

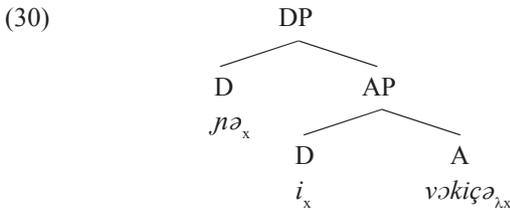
Recall that in Albanian, there is a particular subset of nouns, namely kinship terms, which occur with a preposed article, as in (9). The article of kinship terms behaves like the prenominal D of English, since it precedes numerals and it is mutually exclusive with other quantifiers, as in (28). In other words, prenominal and preadjectival D are different in Albanian as well.

- (28) (a)  $\text{tə}$   $\text{katra}$   $\text{kufiriç-ətə}$  *Arbëresh–Vëna*  
 the four cousins  
 “his/her/their four cousins”
- (b)  $\text{ʃum}$   $\text{kufiriç}$   
 many cousins  
 “many cousins (of his/her/theirs)”

Where the same lexical bases that we have considered so far to be adjectives are nominalized, the linker D can combine with a higher D, bearing in particular indefiniteness properties, as in (29).

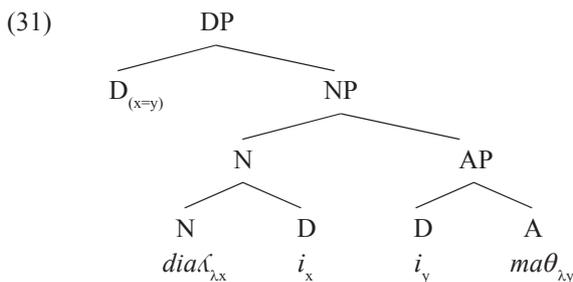
- (29) (a) ερθ    mə    i    mað-i                    *Arbëresh–Vëna*  
 came more the big-NOM.M.DEF  
 “The bigger one came.”
- (b) ερθ    i    vɔgəλ-i/                    ε    vɔgəλ-a  
 came the little-NOM.M.DEF/ the little-NOM.F.DEF  
 “The little one came.”
- (c) ερθ    jə    i    vɔkiçə/    ε    vɔgiλə  
 came a the little-M the little.F  
 “A little one came.”

In (29) the lower D saturates the internal argument of the adjective, according to the schema in (26). However the referential properties of the DP (for instance existential quantification) are determined by the higher D, as in the representation given in (30) for example (29c).



The article instantiated in (i.e., projecting) the highest position of the DP is interpreted as indicating that there is an individual (or set of individuals, or unique/familiar/etc. individual, and so on) on which the properties of the NP predicate and those of the sentential predicate overlap—i.e., as a quantifier in generalized quantifier theory. The lower article values the argument slot of A, awaiting further quantificational closure (namely by the higher D). Both of them, besides being associated with nominal class (gender) and number features, have interpretable (in)definiteness properties. However the lower one is interpreted as a bound variable of the higher one, rather like the determiner and the doubling clitic in Romance (24).

Building on the structure of the English DP in (25), Higginbotham (1985) proposes that its adjectival modification involves the identification of the R-role of the noun with the theta-role of any modifying adjective. Applying the same idea, in structure (31) for Albanian example (3a) there is ultimately a single argument, satisfying both the predicate “boy” and the predicate “big”; the referent denoted by the complex DP correspondingly must have both the “big” and the “boy” properties (D x: x boy and x big [for a boy]).



Copular sentences, e.g. (5a), involve not only the AP and the copula, but also binding of the linker D by a higher D(P), namely *pro*, as in (32). In other words, the *pro* binds the pre-adjectival linker, exactly like the determiner D binds the linker D.

(32) *pro* [<sub>IP</sub> e[*t*] [<sub>AP</sub> i maθə]]

#### 4.1 Linkers, Determiners, Clitics: Parameters of Cross-Linguistic Variation

Given the preceding discussion, there are two parameters in terms of which the various descriptive categories of determiner, linker, and pronominal clitic (referential or doubling) can be systematized. One parameter is interpretive and we notate it as *free* (head of referential chain) vs. *bound* (bound variable within a chain). Determiners and referential pronouns (deictic or anaphoric) are free in the relevant sense of the terms. Linkers and doubling pronouns are bound. A second parameter is *inflection* vs. *independent head*.<sup>4</sup> Determiners, linkers and pronouns are heads; but Albanian also has definiteness inflection (free, infl). Since heads and inflection admit of common lexicalizations, and so do referring and bound pronominal material, we expect that the series of descriptive elements listed for Albanian on the right-hand side in (33) overlap lexically, as they indeed do.

(33) *Arbëresh–Vëna*  
 bound, infl  
 free, infl            *definite inflection*  
 bound, head        *linker, doubling clitic*  
 free, head            *clitic, determiner (definite in kinship terms, indefinite)*

4 Here we seek to define and motivate the first parameter. As remarked by an anonymous reviewer, the second is equally (or more) in need of definition. Importantly, the present discussion of the free vs. bound distinction goes through independently of whether the head vs. inflection distinction turns out to have a theoretical status or to be purely descriptive. The traditional notion that inflection is morphological and heads are syntactic is not available to us, since we implicitly adopt a unified view of morphology and syntax of the type introduced by Distributed Morphology. Structurally, we nevertheless keep to the assumption that merge of heads yields phrasal (XP) projections; merge of inflection yields non-phrasal (X) projections.

In Kurmanji, the data in our possession are sufficient to establish that the morphological series *je, ja, jet* appears not only as a linker/*ezafe* (syntactic heads with semantically bound interpretation), but also as a subject clitic of sorts (the preverbal/tense *ezafe* [cf. Haig 2011]) as well as a determiner (the stand-alone *ezafe* with demonstrative reading), as in (34).

- (34) *Kurmanji*  
 bound, infl  
 free, infl            *indefinite inflection*  
 bound, head        *ezafe/pre-verbal ezafe*  
 free, head         *stand-alone ezafe (demonstrative)/pre-verbal ezafe*

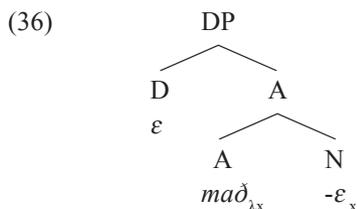
## 4.2 Is “Agreement” Interpretable?

Crossing our parameters in tables (33)–(34), we predict the existence of elements that are inflectional and bound. A natural interpretation of this class of elements is that they correspond to what is ordinarily called agreement, as in the German examples in (23) or the Italian example in (24). This implies that agreement inflection is interpreted, albeit as bound variables of higher, fully referential elements. In turn, this clashes with one of the central tenets of current minimalist theory, namely that agreement on predicate heads is uninterpretable (Chomsky 1995). Yet, quite independently of linker data, there are reasons to be wary of the standard minimalist conception of agreement, at least within DP/AP. D is expected to be a probe in (35), cf. (24), on c-command grounds; but D is argumental according to Higginbotham (1985), and phi-features are always interpretable on arguments. Vice versa, if we associate the N head with uninterpretable features, we are faced with a probe that looks upwards rather than downwards; the same applies if the adjective probes for the referential D.

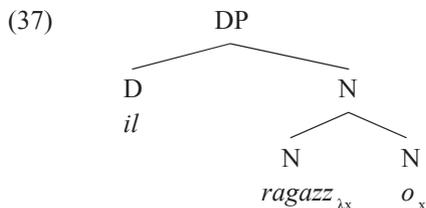
- (35) (a) *la ragazza bionda Italian*  
 “the blonde girl!”  
 (b) [<sub>DP</sub> l-a    [<sub>NP</sub> [ragazz-a]    [biond-a]]]

This type of difficulty has given rise to multidirectional agreement (cf. Béjar and Rezac [2009], among others) in current minimalist research. Nevertheless, probing indifferently upwards and downwards weakens the original minimalist conception of agreement. As outlined by Brody (2006), minimalist agreement differs from other treatments of agreement (including generative ones) in introducing a probe-goal asymmetry. In other words, agreement becomes like movement. If transferred to the domain of movement, the option of probing upward or downward would mean that movement can go down as well as up.

Suppose then we treat agreement inflection as (bound, infl), in the sense of (33)–(34). The Adjective in (5a) has the structure in (36)—i.e., it consists of a lexical base *mad*—denoting the content of the predication (the set of “big” individuals), followed by agreement inflection *-ε*, identified with the N category because of its Nominal class properties (the traditional gender [cf. Harris 1991; Manzini and Savoia 2007]). The possibility that we suggest here, as an avenue for further research, is that the N inflection *-ε* in (36) provides a partial saturation of the argument slot of the nominal predicate, acting as a bound variable of the higher D saturating the same argument.



Suppose that instead of beginning our discussion with English *the boy*, we had introduced it with its Italian counterpart in (37), *il ragazzo*. The predicate *ragazz-* has an argument slot to be satisfied. The N class inflection *-o* provides a partial saturation of it (here gender descriptive content), while the determiner *il* contributes definiteness, shifting the type of the expression.



As we expect, the agreement inflection and the determiner can have an identical lexicalization in many Romance languages, for instance in Portuguese in (38).

- (38) o menin-o;      os menin-os      *Portuguese*  
 the boy-M.SG;      the boys-M.PL

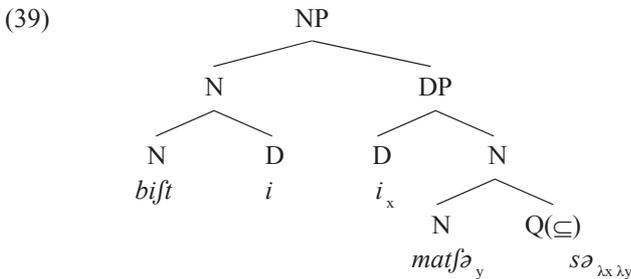
If, as suggested here, all phi-feature bundles are interpretable at least within DPs/APs, Agree can no longer be Match (identity) of uninterpretable features (probe) with interpretable ones (goal) under minimal search. We can still take Agree to be minimal search and Match, but applying to interpretable feature sets. The application of standard minimalist Agree is forced by Full Interpretation, which requires the deletion of

uninterpretable feature prior to the LF interface (though this requires a certain amount of look-ahead). Under the present conception, Agree can equally be forced by Full Interpretation at the LF interface, since it builds the sequences of discontinuous referential material that corresponds to single referents/argument slots.

## 5. Linkers and Genitives: The Relational Content of Oblique Case

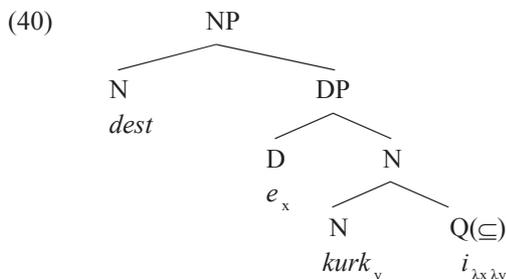
We conclude by briefly considering pre-genitival linkers. We treat genitive case as having a relational content, of the type imputed to it traditionally, roughly “possessor.” As already discussed, it is equally natural to construe ditransitive verbs as events causing a possession to hold (“I give the book to John” as “I cause the book to be in John’s possession” [cf. Kayne 1984]). We take this to be the origin of the widespread so-called syncretism between genitive and dative—holding in Albanian and in those Iranian languages (Kurmanji) which still have a case declension. Following Belvin and den Dikken (1997), writing on the verb “have,” we take the relevant characterization of possession to be an “inclusion” one. Following Manzini and Savoia (2011a, 2011b), we notate it as  $Q(\subseteq)$ . Since relational content inside DPs is carried by Q elements (as in generalized quantifier theory) we further adopt the label  $Q(\subseteq)$  for the oblique case ending. Nothing hinges on this precise category.

The schematic representation for the Albanian Noun-genitive DP in (4a) is then as in (39). The genitive noun is formed by the predicative base *matf*- “cat” merged with the  $Q(\subseteq)$  ending *-sə*. In calling  $Q(\subseteq)$  a possessor/inclusion relation, we imply that it connects two arguments. One is the possessor “(the) cat,” which is provided by the noun (phrase) to which the oblique morphology attaches. The other argument is the head noun (phrase) “the tail,” i.e., the possessum. Before merger of the genitive with the head noun can take place in Albanian, it is nevertheless necessary to provide a (partial) saturation of the external argument of  $Q(\subseteq)$  within the genitive DP itself, namely by the linker D head, *i* in (39), ultimately bound by the head noun with which it agrees.



As in Albanian (39), the  $Q(\subseteq)$  inflection in Kurmanji (40) (cf. example [8a]) introduces a possession/inclusion relation between the noun to which it attaches (the possessor)

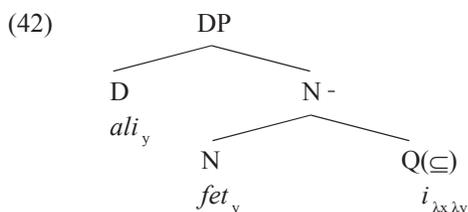
and the head noun (the possessum); the D linker provides satisfaction of the possessum argument within the genitive DP.



Aromanian pregenitival introducers, as in (41), differ from pre-adjectival linkers, illustrated above in (20). They are worth mentioning here in that they agree not with the head noun but with the possessor, not only in case (cf. Toosarvandani and van Urk 2012 for Zazaki), but also in phi-features. In other words, in the structure in (42), *ali* provides D saturation for the internal argument of  $Q(\subseteq)$ , i.e. the possessor “(the) girls.”

(41) (a) *libr-a o fitʃor-u/ ali fet-i Aromanian*  
 the book of the boy/ of the girl  
 “the boy’s/the girl’s/his/her book”

(b) *libr-a o fitʃor-ju/ o fet-uɣu*  
 many of the boys/ of the girls  
 “the boys’/the girls’/their book”



Philip (2012, 49–50), as part of her treatment of linkers as semantically void markers of head-dependent relations, explicitly states that:

Where the sole purpose of a morpheme is to mark a syntactic relationship between two distinct extended projections—that is, a Head-Dependent relationship, we would expect . . . the primary agreement in Dependent-marking should cross-reference features of the head (cf. Nichols 1986, 58; also Zwart 2006, 56–57).

In other words, the Aromanian *o/ali* introducer does not fall under her theory of linkers. In the present approach, whether *ali* in (42) is or is not a linker is a moot point. The macrocategory “linker” has been decomposed into its elementary constituent parts (cf. [33]–[34]), allowing us to capture exactly not only the discontinuity, but also (unlike Philip) the continuity between Albanian/Kurmanji and Aromanian.

## 6. Conclusion

We argued that the linker of Albanian and Kurmanji is best construed as a D head, insuring the satisfaction of an A predicate (the adjective) within the AP; when the AP modifies a head N, the linker functions as an agreement/clitic double of the referential D (the determiner) that closes off the whole DP. This analysis was extended to possessor modification. The possessum-possessor relation is identified with the part-whole relation, notated  $Q(\subseteq)$  and lexicalized in Albanian and Kurmanji by oblique case. The two arguments of the relation are the possessor (the “whole”) and the possessum (the “part”). The linker concurs to the saturation of the external argument of  $Q(\subseteq)$  within the genitive phrase.

Our approach applies to elements which have not necessarily been taken as linkers in the literature (the Aromanian dative introducer). Vice versa, French *de* or English *of*, which have been assimilated to linkers in the literature, can be considered instantiations of the same  $Q(\subseteq)$  relation that is lexicalized in Albanian by case endings (cf. Fillmore 1968). Within the class of linkers as understood here, descriptive terminologies such as article (Albanian), *ezafe* (Iranian) or others capture differences concerning for instance enclitic vs. proclitic status or lexical identity with other agreement/clitic morphology in the language. These are lexical differences, as we might independently surmise on the basis of minimalist ideas about parameters of crosslinguistic variation.

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# English Modals and Late Insertion

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**Abstract:** This paper attempts to do what is not normally attempted: to explain why certain syntactic/semantic features are spelled out by particular phonological exponents. The standard assumption is that the association between features and exponents is arbitrary and hence not explainable. However, in the particular domain of English modal selection, it will be shown that not every aspect is arbitrary and generalizations can be found. It is these generalizations that the paper attempts to account for. Based on Palmer (1987; 2001), using notions of *type*, *degree*, and *tentativeness*, a feature based analysis is proposed. On the basis of this, it is noted that all modals spell out only one *degree* feature, but multiple *type* features. After exploring and rejecting different approaches from the lexicalist and late insertion camps as possible explanations for this generalization, an Optimality Theory based approach is proposed and shown to be superior in a number of ways.

**Keywords:** modal features; lexicalism vs. late insertion, Subset/Superset Principle; Optimality Theory.

## 1. Introduction\*

This paper is concerned with the distribution of English modal auxiliary verbs across the range of meanings they express. There are nine modal auxiliaries and each one is used to express a number of modal meanings. Though their distribution over these meanings demonstrates a complex pattern, it is by no means random and it is these regularities that are the focus of the paper.

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The question of the formal representation of these meanings will not be explored here. Indeed, a non-formal approach will be taken, largely based on Palmer (1987; 2001). Moreover, not all meaning distinctions that modals express will be considered, concentrating instead on just three aspects: *type*, *degree*, and *tentativeness*. These seem to form a core of modal meaning that all modals are specified with respect to.

For simplicity, only assertive contexts will be included in this study. Further complexities are introduced in negative and declarative contexts. For example, while *must* is used to express both epistemic and deontic modality in assertion, it only expresses deontic modality in the scope of negation.<sup>1</sup> The opposite is true with *can*, which is used to express deontic but not epistemic modality in assertive contexts, but can express epistemic modality under negation. In order to establish a basis for accounting for modal distributions, these extra complexities will be set to one side for future work. For the same reason, the semi-modals *need* and *dare* will not be included in the present study, being restricted to non-assertive contexts (e.g., *you needn't go*, *dare I ask?*).<sup>2</sup>

## 2. Aspects of Modality

### 2.1 Type and Degree

Palmer (1987) analyzes the English modals into three *types*: epistemic, deontic, and dynamic. These can be exemplified by the different uses of *could*:

1 As the reviewer points out, when the modal has the wider scope, it can maintain its epistemic interpretation, as in:

- (i) it must not have rained

This is a case of assertion, and so is consistent with the claims of this paper.

2 The case of *ought* is extremely interesting. Its main difference from the other modals is mainly syntactic, in that it usually requires *to* in an infinitival complement. Semantically, however, it is very similar to *should*, expressing tentative deontic and epistemic necessity:

- (i) I ought to/should leave (but I won't)
- (ii) that ought to/should be the right answer (I think)

My own dialect uses *should* to support *ought*, which I take as evidence that the two are similarly specified:

- (iii) he ought to go, shouldn't he
- (iv) you shouldn't ought to do that

Although this is not a common non-standard phenomenon, it seems to me more explicable than the more common non-standard use of *have* for this purpose. Modal *have* is more like *must* in that it is not tentative and so it is strange that it is used to support *ought*:

- (v) I have to/must leave (\*but I won't)
- (vi) that has to/must be the right answer (? I think)

- (1) (a) from what we've found, this could be the solution
- (b) you could attend the ceremony, but only if you have an invitation
- (c) in those days, I could run for miles

In (1a), *could* expresses *possibility* (epistemic), in (1b) *tentative permission* (deontic), and in (1c) *past ability* (dynamic). Palmer argues against the popular view that the last two cases should be collapsed into a single non-epistemic modality<sup>3</sup> on the grounds that they behave differently with respect to their interaction with tense, negation, and voice (e.g., *could* in [1b] does not express a “past permission”).

A slight deviation from Palmer's terminology will be adopted here. Instead of the term *dynamic* to name the modality of volition and ability, *potential* will be used. Palmer's term is slightly unfortunate given that it is also used in the classification of verb types (as opposite to *stative*). The fact that its initial letter “d,” as is that of deontic, is also unfortunate as, in the following, the *types* will be identified by their initial letters for brevity: **E**(pistemic), **D**(eontic) and **P**(otential).

Palmer also distinguishes two *degrees* of modality for each *type*, which he refers to as “necessity” and “possibility.” These terms are taken from the domain of epistemic modality, but the intuition is that the same distinction cuts across all modality *types*.

While it makes some sense to view obligation as “deontic necessity” and permission as “deontic possibility,” the terminology does not really stretch to potential modality. Indeed, due to difficulties in providing a formal account of the meaning of degree across all modal types, some have explicitly denied that there is such a uniform notion. However, Kratzer (1977) argues that *degree* is the core meaning of modality. She claims that the meaning of *must* in (2) is uniform and the epistemic versus deontic difference is due to the “in view of” phrases, which would be unpronounced but understood in most cases:

- (2) (a) in view of what is known, the Maoris *must* have come from Tahiti
- (b) in view of what their tribal duties are, the Maori children *must* learn the names of their ancestors

Without going into Kratzer's theory, we can briefly present her definitions of these core meanings. The core meaning of *must* entails that the proposition it operates on *logically follows from* the set of propositions delivered by the “in view of” phrase, where “logically follows from” means that the proposition is true in every case that the set of

3 Often called “root” modality, a notion Palmer attributes to Hofmann (1976).

propositions is true. For *can*<sup>4</sup> the condition is that its proposition is “compatible with” the set of propositions: i.e., true in at least one case where the set is true.

While Kratzer’s work is not central to the analysis adopted in this paper, it shows that the idea that the *degree* of modality is a uniform notion is not just part of the descriptive tradition. Moreover, Kratzer’s terminology, rather than Palmer’s, will be adopted here. We will identify the different values of *degree* by the initial letters of the terms **F**(ollows from = “necessity”) and **C**(ompatible with = “possibility”). Hence we will be working with the following notions:

|                        |          |                  |                |                  |
|------------------------|----------|------------------|----------------|------------------|
| (3)                    |          | <i>Epistemic</i> | <i>Deontic</i> | <i>Potential</i> |
|                        | <b>E</b> | <b>D</b>         | <b>P</b>       |                  |
| <i>follows from</i>    | <b>F</b> | necessity        | obligation     | volition         |
| <i>compatible with</i> | <b>C</b> | possibility      | permission     | ability          |

There are other reasons to believe that *degree* is a uniform notion cutting across all *types*. First is the fact of the uniformity of the system demonstrated in (3): for every *type* there are two *degrees*. Further, no matter what modality *type* modals express, they always express the same *degree*, indicating that they are associated with a single *degree* feature, independent of their *type* specification.

## 2.2 Tentativeness

There is another aspect of modal classification which Palmer (1987) refers to concerning the distinction between epistemic *may* and *might*:

- (4) (a) he may be in his office  
 (b) he might be in his office

Palmer claims that (4b) is more tentative than (4a). This is not an uncommon claim: traditionally *might* is seen as expressing something more uncertain than *may*.

However, this may also be a distinction which cuts across all modality *types*. Consider the following examples:

- (5) (a) you can leave (if/providing that you’ve finished your work)  
 (b) you could leave \*(if/providing that you’ve finished your work)

4 The use of *can* to exemplify “possibility” is slightly odd here as in English this modal cannot express epistemic possibility in assertive cases, as pointed out earlier. It is possible that what Kratzer has in mind is the German *kann*, which is not so restricted. Many of Kratzer’s examples are in German, though she tends to gloss *kann* with *might*—see, for example, Kratzer (2013).

- (6) (a) he will lend you the money (if you ask nicely/but only when he gets to know you)
- (b) he would lend you the money \*(should he be in a good mood/but only under certain conditions)

In (5) and (6) we see a distinction between the use of *can* and *could* in their deontic sense and between *will* and *would* in their potential sense. It seems that while *can/will* are compatible with conditional modification, for *could/would* this modification is necessary. The conditional places restrictions on the permission granted or the willingness expressed and hence makes them more uncertain, in a way similar to the distinction between *may* and *might* in (4).<sup>5</sup> Thus in addition to *type* and *degree*, we will also claim that *tentativeness* is a major aspect of the meanings expressed by the English modals.

### 3. Analysis and a Generalisation

From the above an obvious feature based analysis suggests itself, using three *type* features ([E], [D], and [P]), two *degree* features ([F] and [C]) and a binary *tentativeness* feature ([±T]). The following table provides an analysis of the English modals using these features:

| (7)      | [E]                                    | [D]                       | [P]        |
|----------|--|---------------------------|------------|
| [F] [-T] | must (2a)<br>will (25c)<br>shall (31a) | must (2b)<br>shall (9b)   | will (6a)  |
| [F] [+T] | should (fn. 2 ii)<br>would (31a)       | should (fn. 6 ii)         | would (6b) |
| [C] [-T] | may (4a)                               | may (18)<br>can (18)      | can (5a)   |
| [C] [+T] | might (4b)<br>could (1a)               | might (26b)<br>could (1b) | could (1c) |

The numbers after the modals in (7) indicate examples in this paper of their uses with these particular meanings.

<sup>5</sup> Historically, the past forms of modals have developed into the tentative forms in Modern English, with the exception of *must*. Interestingly, for *must*, *should* is used as its tentative version. This is shown by the fact that while *must* imposes inviolable obligations, the obligations that *should* imposes are violable:

- (i) ! he must leave, but he won't
- (ii) he should leave, but he won't

That many of the cells in (7) are filled by more than one modal does not mean that these groupings are synonymous. Indeed, only *might* and *could* expressing epistemic modality are difficult to distinguish:

(8) (a) we might be being followed

(b) we could be being followed

In all other cases, however, there are clear differences to be seen. These differences are probably best viewed in terms of secondary features which are restricted to specific *types* of modality. For example the distinction between *must* and *shall* in their deontic sense concerns their orientations: *must* is subject oriented, in that the obligation it expresses falls on the subject, whereas *shall* expresses an obligation which falls on the speaker:

(9) (a) you must go to the party

(b) you shall go to the party

(9a) is a directive, obliging the subject to fulfill a certain requirement, whereas (9b) is a promise made by the speaker to bring about a certain state of affairs. This distinction is absent when these modals express epistemic modality.<sup>6</sup> Another case in point concerns *may* and *can* in their deontic uses. The distinction here appears to be one of formality. The tentative versions of these modals, *might* and *could* also inherit this distinction with deontic *might* being more formal than deontic *could*. However, this distinction is absent in the use of these modals to express epistemic modality—neither of the examples in (8) is more formal than the other. In the rest of this paper we will not focus on these secondary features, only returning to them when necessary.

The distribution of the English modals, as described in (7), is complex. Every modal form is used to express at least two combinations of features and one, *could*, appears three times in the table. However, this distribution is not random and a general pattern can be discerned. Reading *across* the rows of the table, we find multiple occurrences of modal forms: *must* appears twice in the first row, as do *shall* and *will*, etc. However, reading *down* the columns, each form appears only once. In other words, each modal form is

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6 (i) he must have come in through the back door

(ii) we shall know the answer tomorrow

The restriction to the first person for *shall* may have something to do with its speaker orientation, though clearly this is not the spelling out of this feature. This use of *shall* is on the decline and instead *will* is used by many. Both *will* and *shall* are distinguished from *must* in that they are predictive in epistemic contexts rather than deductive. This is another secondary feature.

used to express different *types* of modality, but they always express the same *degree* and *tentativeness* values. These generalizations are expressed in (10a) and (b):

- (10) (a) Every modal form expresses at least two *types* of modality (epistemic, deontic, potential);
- (b) Every modal form expresses only one *degree* of modality (necessity, possibility) and one value of *tentativeness*.

These generalizations obviously require an explanation. In the next sections we will explore a number of different approaches in an attempt to find an account for these observations.

#### 4. Lexicalism and Structural Position

A standard view takes lexical items to be bundles of phonological, syntactic, and semantic features, which the syntax manipulates as unanalyzed units. Which features are bundled together is arbitrary. From this perspective, the amount of homonymy demonstrated by the English modal system is disturbing. While the accidental combination of a single phonological form with more than one set of semantic features is possible, the fact that this happens with every English modal requires some explanation. However, the arbitrary nature of the lexicon will make such explanations difficult and an explanation of the generalizations in (10) even more so.

There is, however, a proposal for a possible solution to this problem.<sup>7</sup> Based on Cinque's (1999) claim that epistemic modals universally precede tense while root modals follow it, Hacquard (2013) proposes that modals have two possible positions: one at the VP level, with root interpretation, and one at the TP level, with epistemic interpretation.<sup>8</sup> Modals are specified in the lexicon for *degree*, but their *type* is determined by their syntactic position. Hacquard makes no distinction between deontic and potential modality, and to be able to account for the full range of meanings it would be necessary to extend it further. Nauze (2008) claims that potential modality is always positioned below deontic and so it would seem that Hacquard's approach might be extended in the relevant way using a site lower than the full VP for potential modals. Under current structural views of a richly articulated VP, presumably it would not be difficult to accommodate these.

Unfortunately there remain a number of problems which Hacquard's proposals leave unsolved. If modals are specified only for *degree* in the lexicon, it is puzzling why

<sup>7</sup> My thanks to David Adger for pointing out this possibility to me.

<sup>8</sup> One problem for this suggestion is the "speaker orientation" of the deontic modal *should*, which as a root modal scopes over the VP event, which presumably excludes speech event notions such as speaker.

there are so many of them. The system would be able to function with just two: one [F] and one [C]. But there are nine. Moreover, if *type* interpretation is just a matter of structural position, with no reason to expect that any modal cannot occupy any relevant position, all modals should be able to express any modality *type*. But, as we know, this is far from the truth. In order to account for this, the lexical entry for each modal must contain restrictions determining which positions it can occupy. Yet, this would be tantamount to specifying which *types* each modal is capable of expressing, which is exactly the situation that these proposals were made to avoid. Finally, although assumptions about the structural positions of a modal can account for certain aspects of its interpretation, it is difficult to see how *type* distinctions follow from different positioning. Why would modals which are structurally associated with the VP have to be interpreted as expressing obligation or permission, or those associated with a more embedded structure as expressing willingness and ability? It is easier to see why something which expresses obligation or permission should scope over event structure rather than, for example, the proposition. But the fact that if a modal has a given *type* interpretation, it will take a certain scope (and hence occupy a certain position) does not entail that if it has a certain scope, it will be interpreted as expressing a certain *type*. We cannot therefore dispense with the lexical marking of *type* and hence the problems associated with the lexicalist position identified at the beginning of this section still remain to be solved.

In conclusion the lexicalist position proves to be unsuitable for accounting for the distribution of the English modals over the range of meanings they express. This is not particularly surprising given that the notion of a lexicon assumed by this position is that of an arbitrary association of forms and meanings and on the basis of this it is impossible to account for generalizations about them.

## 5. Late Insertion: Subset and Superset Principles

A more recent view of the association between phonological exponents and semantic features is adopted by proponents of Distributed Morphology (Halle and Marantz 1993) and Nanosyntax (Starke 2009).<sup>9</sup> Essentially the idea is that the syntax operates on units smaller than lexical items, i.e., the features that are traditionally seen to be bundled in a lexical entry. Only after the grammatical arrangement of these is established are the phonological exponents selected to spell them out. Of specific interest here is the assumption that exponents are not selected on the basis of being associated with exactly the set of target features but instead on the basis of being their “best” realization. This entails that the same exponent may spell out a range of target feature sets: if it is the best one available for the purpose in each case. The approach therefore offers a new perspective on ambiguous forms, which may be of help for the present paper.

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<sup>9</sup> The approach has its present roots in the work of Anderson (1992) though the idea was also proposed much earlier by McCawley (1968).

Much rests on how an exponent is determined to be the “best” spell out of a target set of features. There have been two main strategies discussed in the literature. The proponents of Distributed Morphology tend to opt for a strategy which sanctions against overspecification. Thus, if an exponent is specified for any feature which is not part of the target set, it is automatically rejected. Underspecification is allowed, as long as there is no more fully specified exponent which could also spell out the target set. This selection procedure is called the Subset Principle, stated as follows:

(11) *The Subset Principle*

Select the exponent associated with the largest subset of features of the target set.<sup>10</sup>

To give a brief example, suppose that the target is {[a], [b]} and further suppose the following two lexical items:

- (12) *exp1* ↔ [a] [b] [c]  
*exp2* ↔ [a]

According to the Superset Principle, as *exp1* is overspecified with respect to the target, it will be rejected. On the other hand, *exp2* is a possible contender. Providing there is no lexical item associated with the target features exactly, then *exp2* will be selected.

Attempting to apply this method to the case of the English modals, however, runs into problems fairly early on. From this perspective, if a modal is specified for any *type* feature, it will be overspecified for spelling out any other. The fact that all English modals are used to spell out more than one *type* feature (10a) means that none of them can be specified for any *type* and their lexical entries must be as follows:

- |      |               |   |          |  |              |   |          |
|------|---------------|---|----------|--|--------------|---|----------|
| (13) | <i>must</i>   | ↔ | [F] [-T] |  | <i>can</i>   | ↔ | [C] [-T] |
|      | <i>will</i>   | ↔ | [F] [-T] |  | <i>could</i> | ↔ | [C] [+T] |
|      | <i>would</i>  | ↔ | [F] [+T] |  | <i>may</i>   | ↔ | [C] [-T] |
|      | <i>shall</i>  | ↔ | [F] [-T] |  | <i>might</i> | ↔ | [C] [+T] |
|      | <i>should</i> | ↔ | [F] [+T] |  |              |   |          |

It is obvious that these assumptions are empirically inadequate in that, as no modal is specified for *type* features, all of them can spell out any *type*.

The consequence is similar to the lexicalist position, which assumes that the *type* of modality is determined by its structural position: both assume that *type* is unspecified in

10 If two lexical items are associated with subset features of the target set but do not stand in a subset relationship to each other, then some other method would need to be adopted. This will not concern us here.

lexical entries and so neither can account for how particular modals are associated with a particular range of *type* interpretations. Subsequently the Subset Principle approach suffers from exactly the same problems faced by Hacquard's lexicalist one.

In fact, the situation is worse here. (13) claims that there are only four different modals: those specified for the sets {[F], [-T]}, {[F], [+T]}, {[C], [-T]} and {[C], [+T]}. Recall however that modals are also differentiated in terms of a set of secondary features. But these features are restricted to situations where modals express a particular *type*: *may* is only "formal" when expressing permission and *should* is only "speaker oriented" when expressing obligation. It therefore follows that no modal can be specified for these secondary features either, otherwise they would be overspecified in situations where they do not spell such features out. Therefore it should be the case that any modal can be used to spell out any secondary feature, which is blatantly contrary to fact.

The second procedure for determining the best exponent for a target set of features, adopted by proponents of Nanosyntax, is based on the Superset Principle. As its name suggests, this is the opposite of the Subset Principle. Under this assumption, underspecification is excluded, and the exponent associated with the minimal amount of overspecification is considered the best.

(14) *The Superset Principle*

Select the exponent associated with the smallest superset of features of the target set.

To exemplify, we can consider again the earlier hypothetical case with the target features being {[a], [b]} and the competing lexical items repeated as (15):

- (15) *exp1* ↔ [a] [b] [c]  
*exp2* ↔ [a]

This time, *exp2* is rejected, as it is underspecified with respect to the target. Therefore *exp1* will be selected, providing there is no competitor specified exactly for the target set.

From this perspective, exponents must be specified for all features they are used to spell out. Hence the lexical entries will be as follows:

- |      |               |   |                  |              |   |                      |
|------|---------------|---|------------------|--------------|---|----------------------|
| (16) | <i>must</i>   | ↔ | [F] [-T] [E] [D] | <i>can</i>   | ↔ | [C] [-T] [D] [P]     |
|      | <i>will</i>   | ↔ | [F] [-T] [E] [P] | <i>could</i> | ↔ | [C] [+T] [E] [D] [P] |
|      | <i>would</i>  | ↔ | [F] [+T] [E] [P] | <i>may</i>   | ↔ | [C] [-T] [E] [D]     |
|      | <i>shall</i>  | ↔ | [F] [-T] [E] [D] | <i>might</i> | ↔ | [C] [+T] [E] [D]     |
|      | <i>should</i> | ↔ | [F] [+T] [E] [D] |              |   |                      |

This is better than the previous approach, as it accurately accounts for the fact that different modals are associated with different sets of *type* features: *must* is associated with epistemic or deontic, *will* with epistemic or potential, etc. However as *could* is associated with all three *type* features, it is associated with more features than any other modal. This is problematic as the Superset Principle predicts the exclusion of *could* in situations where it is actually used. Both *could* and *might* are used to spell out the feature sets {[C], [+T], [E]} (tentative epistemic possibility) and {[C], [+T], [D]} (tentative deontic possibility). But as the specification for *might* is a subset of that for *could*, *might* and not *could* will be selected. Under these assumptions *could* will only be used to spell out {[C], [+T], [P]} (tentative potential possibility), as it is the only lexical item specified for this set.

A similar potential problem arises concerning the secondary features, which extend the lexical specification for every modal associated with each one. The more such features a modal is associated with the bigger its specification and the worse it will do in competition with those associated with fewer secondary features.

Besides these problems, it is not entirely clear how the Superset approach is better than the lexicalist position which assumes a large degree of homonymy. The Superset approach simply shifts the ambiguity from the lexicon to the individual lexical entries with no discernible advantage. Just as with the lexicalist position, these lexical entries are arbitrary associations of exponents with the features they spell out and therefore they offer no explanation for the distribution of the modals over these sets of features. There is clearly no account here of the generalization (10b).

In conclusion, despite the promise of the late insertion approach, it surprisingly turns out to yield results remarkably similar to the lexicalist approaches. None of these approaches seems to be capable of accounting for the facts, and therefore we are in need of some other way to approach the problem.

## 6. Targeted Underspecification

The proposal forwarded here is based on a late insertion strategy which allows for both over and underspecification and therefore rejects both the Subset and Superset Principles. It works on the idea that target features ideally should be spelled out, though overspecification is not penalized. In this way it has something in common with the Superset Principle. However, the underspecification of certain selected features is sanctioned, if necessary, and hence the Superset Principle is not strictly adhered to. The competition for selection takes place in an Optimality Theory framework, which will be introduced later in this section. However, there is some preliminary set up work to be carried out before we turn to the selection procedure.

The first thing to establish is the non-trivial feature specification of the modals. Given that we will be assuming a late insertion approach in which exponents compete against each other for selection, we will take those cases where there is only one winner for a particular

set of features to indicate that these modals are specified for at least these features. Based on the distributions established in (7), we can identify these cases as follows:

| (17)     | [E] (epistemic) | [D] (deontic) | [P] (potential) |
|----------|-----------------|---------------|-----------------|
| [F] [-T] |                 |               | will            |
| [F] [+T] |                 | should        | would           |
| [C] [-T] | may             |               | can             |
| [C] [+T] |                 |               | could           |

We know that all of these modals are used to spell out other features sets and so the next point to address is how this is possible. To see what is at stake, consider the case of *may* and *can*. Both of these are used to spell out non-tentative deontic possibility ( $\{[C], [-T], [D]\}$ ):

(18) you can/may leave now

One condition that must hold for this to be so is that there can be no modal better specified with respect to this target set, otherwise this would be selected instead of *may* and *can*. The second condition is that, no matter what else they are specified for, both *may* and *can* must be equally specified for the [D] feature: either both are specified for this feature or they are both not specified for it. If we take the first option, then both modals are specified for every feature they are used to spell out and we are back to the Superset Principle position. Therefore, we will take the second option as correct, and assume the following specifications for *may* and *can*:

(19) *may*  $\leftrightarrow$  [C] [-T] [E]  
*can*  $\leftrightarrow$  [C] [-T] [P]

When these modals spell out ( $\{[C], [-T], [D]\}$ ), both match the *degree* and *tentativeness* features [C] and [-T] but not the *type* feature [D].

We have concluded that there can be no modal specified for  $\{[C], [-T], [D]\}$ , but what if there is another which is specified for these *tentativeness* and *type* features but not the *degree* feature? A modal specified for  $\{[F], [-T], [D]\}$  would, *ceteris paribus*, be equivalent to *may* and *can*: specified for two of the target features but not the third. In fact, *must* has exactly this specification, which we will demonstrate shortly. As *may* and *can* are selected to spell out this target, and not *must*, we conclude that all things are not equal. It must be more important to match with the *degree* feature than it is with the *type* feature, and this seems to match the preliminary empirical generalization (10). We will see how this can be achieved in the next section.

## 6.1 Optimality Theory

Optimality Theory is a competition based model designed for selecting the “best” out of a set of competitors. It does this through evaluating the set with a series of conditions, some of which are more important than others. A competitor can be optimal even if it violates one or more conditions, providing that: i) the violation of these conditions ensures the satisfaction of more important conditions; and ii) no other competitor is more optimal.

A brief example will serve to illustrate. Suppose there are three conditions of which A is more important than B which in turn more is important than C. Thus the conditions are ranked in the following order:

$$(20) A > B > C$$

Now suppose a set of competitors which violate these conditions in the following ways:

(21)

|              | A | B | C |
|--------------|---|---|---|
| competitor 1 | * |   |   |
| competitor 2 |   | * | * |
| competitor 3 |   | * |   |

The table presents the competitors in the first column and the following columns list the conditions in rank order. The cells under each condition show the violation pattern for each competitor. So, competitor 1 violates condition A but not conditions B or C, etc. The evaluation of the competitors proceeds as follows: starting with the highest ranked condition (i.e., A), if any candidate satisfies it, then eliminate any competitor which violates it. In our example, competitor 1 is therefore eliminated. This is known as a “fatal violation”: a violation which results in a competitor’s elimination. This can be contrasted with non-fatal violations seen in the next step of the evaluation, where the same procedure is applied to the next highest condition. In this case, as candidate 1 has been eliminated, there are no competitors left which satisfy condition B. Therefore neither remaining competitor is eliminated and their violations of condition B are non-fatal. Both go on to be evaluated by the final condition (C). Here, competitor 2 fatally violates condition C as competitor 3 satisfies it. Hence competitor 3 is deemed optimal.

We can more explicitly demonstrate this process with the addition of a few symbols:

(22)

|              | A  | B | C  |
|--------------|----|---|----|
| competitor 1 | *! |   |    |
| competitor 2 |    | * | *! |
| competitor 3 |    | * |    |

☞

The exclamation marks after asterisks indicate a fatal violation and the pointy finger to the left of the table indicates the optimal competitor.

## 6.2 An OT Analysis of Modal Selection

In order to provide an OT based account of the selection of modals we need to establish the conditions on which each modal will be evaluated. These will simply be a set of “matching” conditions which are violated by any modal which is not specified for a particular target feature. The conditions are:

- (23) **MATCH DEGREE** violated if the degree feature specified for the competitor does not match the target degree feature
- MATCH TENT** violated if the tentativeness feature specified for the competitor does not match the target tentativeness feature
- MATCH TYPE** violated if the type feature specified for the competitor does not match the target type feature

The rank order of these conditions is as indicated above, with **MATCH DEGREE** the highest and **MATCH TYPE** the lowest.

With this in place, we can now return to the question of how *may* and *can* are selected to spell out  $\{[C], [-T], [D]\}$  and why *must* is not. The competition is represented in the following:

(24)

|   | <b>MATCH DEGREE</b> | <b>MATCH TENT</b> | <b>MATCH TYPE</b> |
|---|---------------------|-------------------|-------------------|
| target features   | <b>[C]</b>          | <b>[-T]</b>       | <b>[D]</b>        |
|  <i>may</i> ↔ [C] [-T] [E] |                     |                   | *                 |
|  <i>can</i> ↔ [C] [-T] [P] |                     |                   | *                 |
| <i>must</i> ↔ [F] [-T] [D]  | *!                  |                   |                   |

Given that *must* violates the highest ranked condition and *may* and *can* do not, the former is eliminated from the competition at the first hurdle. As there is no condition which one of the surviving competitors satisfies that the other violates, they are both deemed optimal.

It is the low ranking of **MATCH TYPE** that is responsible for the generalization (10a). By ranking this lower than **MATCH DEGREE** and **MATCH TENT**, it is ensured that every modal will be used to spell out the *degree* and *tentativeness* features it is specified for, but the target *type* feature may go unrealized. Modals specified for one *type* can optimally spell out others and hence we have a principled account of the generalization.

Moreover, under these assumptions there is no need for ambiguously specified lexical entries. This will be made more obvious when we look at the specifications

of the other modals. However, the reasoning behind this claim is clear from the discussion so far. Given that modals are able to spell out *type* features that they are not specified for, they need only be specified for at most one such feature. The assumption that there can be no ambiguous lexical entries also plays a role in accounting for generalization (10b): if multiple specification were possible for any kind of feature, we would not be able to account for why each modal spells out only one degree and tentativeness feature.

### 6.3 The Other Modals

Assuming the modals listed in (17) are specified exactly for the features indicated there, we now discuss the remaining three. As already mentioned, *must* is specified for [F], [-T] and [D]. This can be determined from the fact that it competes with *will*, which is specified for [F], [-T] and [P], according to (17). The use of these modals is demonstrated below:

- |          |                                   |               |
|----------|-----------------------------------|---------------|
| (25) (a) | he will lend you the money        | = willingness |
|          | he must lend you the money        | ≠ willingness |
|          | (b) he will deliver the message   | ≠ obligation  |
|          | he must deliver the message       | = obligation  |
|          | (c) that will be the right answer | = necessity   |
|          | that must be the right answer     | = necessity   |

Clearly both *must* and *will* are specified for [F] and [-T] as they always spell out these features. However, only *will* spells out “necessary potential” (i.e., willingness), therefore *must* cannot be specified for [P]. Moreover, both *must* and *will* spell out epistemic necessity, thus both are equally specified for [E]. As *will* is specified for [P] it cannot be specified for [E] and so neither can *must*. Finally, out of the two, only *must* spells out deontic necessity (obligation) and therefore it must be specified for [D]. We therefore derive the feature specification for *must* given below:

- (26) *must* ↔ [F] [-T] [D]

The modal *should* appears in the same contexts as *must* which means that it is specified for the same features. Therefore we conclude that *should* is also specified for [F], [-T], and [D].

Finally, *might* is in competition with *could*, which is specified for [C], [+T], and [P] (see [17]). The uses of these modals are exemplified in the following:

- (27) (a) in those days I could run faster = ability  
           in those days I might run faster ≠ ability
- (b) you could/might join the team, but only if . . . = permission
- (c) he could/might be in his office = possibility

As *could* is the only modal to spell out tentative “possible potential” (ability), we know that *might* is therefore not specified for [P]. However, both *might* and *could* spell out deontic and epistemic possibility ( $\{[C], [+T], [E]\}$  and  $\{[C], [+T], [D]\}$ ), which means that *might* is specified for neither [E] nor [D]. Therefore it is specified for no *type* feature at all.

The full lexical specifications for all English modals we arrive at are presented below:

- (28) *must* ↔ [F] [-T] [D]      *can* ↔ [C] [-T] [P]
- will* ↔ [F] [-T] [P]      *could* ↔ [C] [+T] [P]
- would* ↔ [F] [+T] [P]      *may* ↔ [C] [-T] [E]
- shall* ↔ [F] [-T] [D]      *might* ↔ [C] [+T]
- should* ↔ [F] [+T] [D]

As promised earlier, there are no ambiguous lexical entries: each modal is specified for at most one *degree*, one *tentativeness* and one *type* feature.

We will now demonstrate how the Targeted Underspecification procedure works, using the complete set of modals. In (29), the target feature set is  $\{[C], [+T], [E]\}$ , i.e., tentative epistemic possibility:

(29)

|                               | MATCH DEGREE | MATCH TENT | MATCH TYPE |
|-------------------------------|--------------|------------|------------|
| target features               | [C]          | [+T]       | [E]        |
| <i>must</i> ↔ [F] [-T] [D]    | *!           | *          | *          |
| <i>will</i> ↔ [F] [-T] [P]    | *!           | *          | *          |
| <i>would</i> ↔ [F] [+T] [P]   | *!           |            | *          |
| <i>shall</i> ↔ [F] [-T] [D]   | *!           | *          | *          |
| <i>should</i> ↔ [F] [+T] [D]  | *!           |            | *          |
| <i>can</i> ↔ [C] [-T] [P]     |              | *!         | *          |
| ☞ <i>could</i> ↔ [C] [+T] [P] |              |            | *          |
| <i>may</i> ↔ [C] [-T] [E]     |              | *!         |            |
| ☞ <i>might</i> ↔ [C] [+T]     |              |            | *          |

Here, as the target *degree* feature is [C], all those modals not specified for this are immediately excluded. MATCH TENT excludes *can* and *may* as they are not specified for [+T], and as neither *could* and *might* satisfy MATCH TYPE, both survive and are deemed optimal.

Next let us consider the case where the target is non-tentative epistemic necessity ({[F], [-T], [E]}), a case where three modals are selected:

(30)

|   |                              | MATCH DEGREE | MATCH TENT | MATCH TYPE |
|---|------------------------------|--------------|------------|------------|
|   | target features              | [F]          | [-T]       | [E]        |
| ☞ | <i>must</i> ↔ [F] [-T] [D]   |              |            | *          |
| ☞ | <i>will</i> ↔ [F] [-T] [P]   |              |            | *          |
|   | <i>would</i> ↔ [F] [+T] [P]  |              | *!         | *          |
| ☞ | <i>shall</i> ↔ [F] [-T] [D]  |              |            | *          |
|   | <i>should</i> ↔ [F] [+T] [D] |              | *!         | *          |
|   | <i>can</i> ↔ [C] [-T] [P]    | *!           |            | *          |
|   | <i>could</i> ↔ [C] [+T] [P]  | *!           | *          | *          |
|   | <i>may</i> ↔ [C] [-T] [E]    | *!           |            |            |
|   | <i>might</i> ↔ [C] [+T]      | *!           | *          | *          |

MATCH DEGREE eliminates all the modals not specified for [F] and MATCH TENT eliminates those not specified for [-T]. The remaining three all violate MATCH TYPE and so none are eliminated and all three are optimal.

There are twelve possible combinations of the primary modal features, listed below in (31). For six of these, there are modals with exactly these specifications. In (24), (29) and (30) we have demonstrated the competitions for a further three feature sets. The reader is left to determine the accuracy of the system for the remaining three cases, indicated in bold and exemplified in (32):

- (31) {[F], [-T], [E]} must, will, shall  
 {[F], [+T], [E]} **would, should**  
 {[F], [-T], [D]} **must, shall**  
 {[F], [+T], [D]} should  
 {[F], [-T], [P]} will  
 {[F], [+T], [P]} would  
 {[C], [-T], [E]} may  
 {[C], [+T], [E]} could, might  
 {[C], [-T], [D]} can, may  
 {[C], [+T], [D]} **could, might**  
 {[C], [-T], [P]} can  
 {[C], [+T], [P]} could

- (32) (a) from past experience of the director, this *should* be a good film {[F], [+T], [E]}  
 given what we all know about him, he *would* say that,  
 wouldn't he
- (b) you *must* have a degree to teach at the university {[F], [-T], [D]}  
 you *shall* have your money
- (c) according to the regulations, he *could/might* join the regi- {[C], [+T], [D]}  
 ment, but only if he passes a medical

## 7. Some Further Issues

In this final section a few remaining issues will be discussed, namely how Targeted Underspecification copes with secondary features and questions about language variation.

### 7.1 Secondary Features in Targeted Underspecification

Presumably modals are specified for the secondary features that they spell out. As such features are only relevant for certain contexts, the modals are overspecified with respect to these features in the rest of their uses. We have seen that this causes problems for both the Subset and the Superset Principle approaches.

From the Targeted Underspecification approach one might think that the best way to deal with secondary features is to rank a secondary feature matching condition low. But this is not necessary. It is never the case that a target secondary feature does not get spelled out. On the other hand, modals specified for a secondary feature can be used in cases where that feature is not part of the target set. The problem is therefore one of the overspecification of modals rather than the non-realization of target features.

When a modal specified for one *type* spells out another, there are two mismatches: the target feature is not spelled out and the modal is overspecified. The low ranking of the MATCH TYPE takes care of the first mismatch. The overspecification of the modal is simply ignored. As overspecification itself is not penalized, secondary features are not a problem.

### 7.2 Language Variation

One point that inevitably comes up in an OT analysis is the question of variation. Variation is achieved by re-ranking conditions: one ranking deems one competitor optimal while another ranking selects a different competitor. The immediate questions for the present paper are what predictions are made by the re-ranking of the matching conditions and whether these are upheld in the cross-linguistic data.

At first, one might think that ranking MATCH DEGREE low would have a similar effect to the low ranking of MATCH TYPE. This should produce languages with homonymous

forms for expressing possibility and necessity but differentiated expressions of *types*. This does not sound very likely. Indeed, while van der Auwera and Ammann (2005) report that out of 207 languages investigated, 102 demonstrate some amount of homonymy in expressing modality *type*, they do not mention any language with homonymous forms expressing *degree*.

However, Targeted Underspecification does not make this prediction and so conforms to the available evidence. To see why this is so, consider a situation in which a language has two lexical items both specified for [E] *type* but differing in their *degree* specification:

- (33)  $exp1 \leftrightarrow [F] [E]$   
 $exp2 \leftrightarrow [C] [E]$

The following tables demonstrate the competition between these items for spelling out {[F], [E]} and {[C], [E]} when MATCH DEGREE is ranked below MATCH TYPE:

(34)

|                 |                                | MATCH TYPE | MATCH DEGREE |
|-----------------|--------------------------------|------------|--------------|
| target features |                                | [E]        | [F]          |
| ☞               | $exp1 \leftrightarrow [F] [E]$ |            |              |
|                 | $exp2 \leftrightarrow [C] [E]$ |            | *!           |

(35)

|                 |                                | MATCH TYPE | MATCH DEGREE |
|-----------------|--------------------------------|------------|--------------|
| target features |                                | [E]        | [C]          |
|                 | $exp1 \leftrightarrow [F] [E]$ |            | *!           |
| ☞               | $exp2 \leftrightarrow [C] [E]$ |            |              |

The low ranking of MATCH DEGREE does not result in the same choice for expressing different *degrees*. The reason for this is that we only get the selection of a mismatching lexical item in the absence of one that is an exact match. This means that we would only get a language with one form for different *degrees* if the lexicon contained no items which were distinguished in terms of *degree* features, which would make the ranking of MATCH DEGREE irrelevant.

Of course, the issue still remains as to why languages appear not to make this particular choice, but this is not something that the Targeted Underspecification approach can, or indeed, should answer. One might speculate that if *degree* is the core meaning of modality, as Kratzer suggests, then it would be too important a distinction not to mark in the lexicon.

## 8. Conclusion

As the lexicon is an arbitrary association between phonological exponents and syntactic/semantic features, it is not often one sees an attempt to “explain” why certain features are realised by particular exponents. Indeed, in this paper the exact feature specifications of particular modals has not been, and probably cannot be, explained. However, what we have noted here is that not every aspect of this is arbitrary and generalisations are possible. It is these that we have set out to account for. Some approaches are better suited than others to do this. Purely lexical theories predict that every aspect of lexical insertion is arbitrary. Hence a lexicalist theory cannot account for generalisations such as (10). Late insertion approaches at least distance the feature specification of lexical element from their actual use. Yet surprisingly the two main procedures for lexical selection, the Subset and Superset Principles, turn out to be hardly any different to the lexicalist approach. The Optimality Theory based approach of Targeted Underspecification has been demonstrated to fare better in this regard, offering a principled account for the fact that modals which are specified for certain values of targeted features can be used to spell out different values of those features. We have seen that the approach also allows an account of the homonymous nature of the English modals without assuming underlying ambiguity. In this way the full potential of a late insertion approach is made use of.

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# Restructuring across the World

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**Abstract:** This paper provides an overview of restructuring in 23 typologically diverse languages. The distribution of three restructuring properties (long passive, clitic climbing, inter-clausal scrambling) shows that there is no simple “restructuring parameter,” but that two types of restructuring need to be distinguished: *voice restructuring*, which regulates long passive, and *size restructuring*, which regulates clitic climbing and scrambling. Although the distribution of restructuring shows significant variation across languages, I show that there are systematicities which justify a unified, yet flexible enough account to cover the six (possibly eight) types of languages attested. An account is proposed which builds on the existence/absence of a particular *voice* head and the properties of the target position of scrambling and clitic movement. The conclusions reached have consequences for theories of clause structure and locality, the make-up of the *voice* domain, as well as the syntax of clitic constructions and scrambling.

**Keywords:** language variation; infinitives; clitic climbing; scrambling; long passive.

## 1. Introduction

Since the seminal works Rizzi (1976; 1978) and Aissen and Perlmutter (1976; 1983) many important studies of restructuring/clause union have been provided in various generative frameworks. Due to the variability of contexts that allow restructuring (both within and across languages), most studies are restricted to specific languages and the conclusions reached in those works are often contradictory. For instance, restructuring infinitives [RIs] have been analyzed as bare V heads undergoing some incorporation process with the matrix verb, as reduced VP or vP complements, and even as clausal TP or CP complements. One question arising from this diversity of analyses is whether the choice of structure proposed is simply a theory-internal matter or whether the restructuring phenomena indeed differ significantly across languages. This paper contributes to this debate by comparing restructuring in 23 (typologically diverse) languages and providing (the outline of) a unified account.

As we will see, rather than a single restructuring “parameter” there are specific points of variation that conspire to create different degrees of restructuring. I show that despite the initial diversity, certain generalizations emerge that allow us to separate language-specific points of variation from the contribution of UG that restricts this variation in predictable ways. Concretely, I argue that the cross-linguistic diversity of restructuring is derived from the existence/absence of a special *voice* head and the location, A vs. A'-status and featural composition of the target position of scrambling and clitic movement.

## 2. The Diversity of Restructuring

In this section, I provide the main distribution of restructuring (Table 1 below). Languages are classified according to three restructuring criteria (long object movement [LOM], clitic climbing [CC], scrambling [SCR]), and three semantic/structural properties (tenseless [-TNS], future [+FUT], CP) to be explained below. LOM is illustrated in (1).<sup>1</sup> As shown in (1a), LOM arises in constructions where the embedded object is promoted to matrix subject, due to passive of the matrix but crucially not the embedded predicate. (1b) is an example of LOM in Spanish.

(1) (a) [<sub>Matrix</sub> object.NOM SE/VP.PASS [<sub>Embedded</sub> VP.ACT/DEFAULT object ]]

(b) Estas paredes están siendo terminadas de  
 these walls were being finished to  
 pintar (por los obreros)  
 paint (by the workers)

Lit. “These walls were being finished to paint (by these workers).”

“They (the workers) were finishing painting these walls.” (Aissen and Perlmutter 1983, 390; [P32b])

CC and SCR refer to movement of clitics or XPs outside the infinitival complement as shown in (2) from Polish.

(2) (a) Marek ją zdecydował się przeczytać t<sub>CL</sub>  
 Mark it decided REFL read.INF t<sub>CL</sub>  
 “Mark decided to read it.” (Bondaruk 2004, 154; [57a])

(b) Marek tę książkę zdecydował się przeczytać t<sub>SCR</sub>  
 Mark this book decided REFL read.INF t<sub>SCR</sub>  
 “Mark decided to read this book.” (Bondaruk 2004, 155; [57b])

<sup>1</sup> Due to space limitations, I cannot provide examples for all languages, but will only be able to give one representative example for each construction/claim in this article. The reader is referred to [http://wurmbbrand.uconn.edu/Susi/In\\_progress.html](http://wurmbbrand.uconn.edu/Susi/In_progress.html) where a file with all the data (including source references) is posted. The file will be updated regularly to include further languages.

[+FUT] infinitives are cases such as (3a) in which the time of the embedded predicate is understood as being situated temporally after the matrix time (which can be expressed via future adverbs like *tomorrow*). [-TNS] infinitives, on the other hand, are cases such as (3b), which do not allow a temporal split (cf. the impossibility of *tomorrow*), but where the embedded predicate is interpreted as occurring simultaneously with the matrix event. Lastly, CPs are assumed to be present when an item which is uncontroversially a complementizer occurs in the infinitive or when the embedded complement is finite.<sup>2</sup>

(3) (a) Leo decided/planned/promised to leave tomorrow.

(b) Leo tried/began/managed to leave (#tomorrow).

Table 1 summarizes these properties in 23 languages. Languages are classified in four groups (A, B, C, D) according to the availability of CC and SCR, and in two further subgroups (1, 2) according to the availability of LOM. Languages which allow LOM (even if it is restricted) are classified as Type #1, languages that prohibit LOM are of Type #2. I will return to the distribution of LOM below.

| Type | Languages   | Long object movement |      | Clitic climbing, scrambling |      |                |
|------|---|----------------------|------|-----------------------------|------|----------------|
|      |   | -TNS                 | +FUT | -TNS                        | +FUT | CP             |
| A1   | European Portuguese, Italian, Romanian, Spanish, Takibakha Bunun, Acehnese <sup>3</sup> | ✓                    | *    | ✓                           | *    | *              |
| A2   | possibly languages with only long <i>se</i> passive (or only functional restructuring)  | *                    | *    | ✓                           | *    | *              |
| B1   | Chamorro, Czech, German, Isbukun Bunun, Kannada, Mayrinax Atayal                        | ✓                    | *    | ✓                           | ✓    | *              |
| B2   | Dutch, Mandarin, Polish, Tagalog  | *                    | *    | ✓                           | ✓    | *              |
| C1   | Japanese, Slovenian   | ✓                    | *    | ✓                           | ✓    | ✓ <sup>4</sup> |
| C2   | Korean, Serbo-Croatian  | *                    | *    | ✓                           | ✓    | ✓              |
| D1   | May or may not exist  | ✓                    | *    | *                           | *    | *              |
| D2   | Brazilian Portuguese, English, French   | *                    | *    | *                           | *    | *              |

**Table 1.** Restructuring cross-linguistically

2 Furthermore, certain types of infinitives, specifically propositional and factive infinitives, may also involve a CP domain (see Wurmbbrand 2014). Due to space reasons, I have to set aside those infinitive in the current paper.

3 Acehnese allows LOM, but I do not have information regarding cc/scr.

4 The table simplifies things to some extent. Like in Type B languages, cc is also blocked across CPs in Type C languages. This will be discussed in Section 4.2

Setting LOM aside for now, we find four types of languages regarding the (im)possibility of CC and SCR. Type A languages allow CC/SCR only from [-TNS] infinitives. An illustration is given in (4) from Italian.

- (4) (a) Piero ti verrà a parlare di parapsicologia  
 Peiro to.you will.come to speak.INF about parapsychology  
 “Piero will come to speak to you about parapsychology.” (Rizzi 1982, 1; [1a–b])
- (b) \*Piero ti deciderà di Parlare di parapsicologia  
 Piero to.you will.decide to speak.INF about parapsychology  
 “Piero will come to speak to you about parapsychology.” (Rizzi 1982, 1; [1c–d])

Group B languages allow CC/SCR from [-TNS] and [+FUT] infinitives (as we have seen in (2) from Polish already), but not from finite clauses (cf. [5a] for CC, [5b] for SCR).

- (5) (a) \*Piotr je powiedział że Marek czytał  
 Peter them said that Mark read.PAST.IMPERF  
 “Peter said that Mark was reading them.” (Marcin Dadan, pers. comm.)
- (b) \*Piotr te książki powiedział że Marek czytał  
 Peter these books said that Mark read.PAST.IMPERF  
 “Peter said that Mark was reading these books.” (Marcin Dadan, pers. comm.)

Group C languages, on the other hand, also allow CC/SCR out of a [+FUT] infinitive as in (6a) from Slovenian (cf. *order someone to do something tomorrow*), but in contrast to Type B languages also allow long-distance SCR from finite clauses (henceforth LDS; see Saito [1985] among many others), as shown in (6b) (but see Note 4 and Section 4.2 for CC).

- (6) (a) Ukazal mi ji je [<sub>INF</sub> reči da sem bolan ]  
 ordered me her aux [<sub>INF</sub> say.INF that aux ill ]  
 “He ordered me to tell her that I am sick.” (Marušič 2005, 128; [57a])
- (b) Janeza se je Peter odločil da mora naučiti manir  
 Janez.ACC se AUX Peter decided that must teach.INF manners  
 “Peter decided that he has to teach Janez some manners.” [SW]  
 (Marušič 2005, 129; [60c])

Finally Group D languages prohibit CC/SCR from all types of infinitives, which is illustrated by Brazilian Portuguese in (7).

- (7) (a) João tentou me ver  
 João tried me see.INF  
 “João tried to see me.” (Cyrino 2010, 9; [38])
- (b) \*João me tentou ver  
 João me tried see.INF  
 “João tried to see me.” (Cyrino 2010, 9; [38])

Let us now bring LOM into the picture. As shown in Table 1, a simple restructuring vs. non-restructuring classification is not adequate, neither for characterizing languages nor for restructuring within one language. B2 and C2 languages are restructuring for the purpose of CC/SCR, but not for LOM. This is illustrated by the Dutch examples in (8). Example (8a) shows that Dutch allows SCR from a RI; (8b) shows that Dutch allows impersonal passive of *try* (+infinitive); however, in contrast to German, cf. (8c), LOM is excluded in Dutch as shown in (8d).

- (8) (a) dat Jan dat boek geprobeerd heeft te lezen  
 that Jan that book tried has to read  
 “that John tried to read that book” (Broekhuis 1992, 39; [77a])
- (b) dat (er) geprobeerd werd dat boek te lezen  
 that (there) tried was that book to read  
 “that they tried to read that book” (Beata Moskal, pers. comm.)
- (c) weil der Roman zu lesen versucht wurde  
 since the.NOM novel to read tried was  
 “since they tried to read the novel”
- (d) \*dat (er) dat boek geprobeerd werd te lezen  
 that (there) that book tried was to read  
 “that they tried to read that book” (Broekhuis 1992, 39; [77b])

Similarly, in B and C languages, [+FUT] infinitives count as restructuring for CC/SCR but not for LOM, as the examples in (9) from German and (10) from Japanese illustrate. The (a) examples show that these languages allow LOM, thus are Type #1 languages (note that despite the translation in (10a), the example involves matrix passive, and no embedded passive, i.e., LOM). The (b) examples show that CC/SCR is possible out of [+FUT] infinitives. Lastly, the (c) examples show that LOM is impossible from such future infinitives.

- (9) (a) weil der Wagen zu reparieren versucht wurde  
 since the.NOM car to repair tried was  
 “since they tried to repair the car”
- (b) weil ihn/den Wagen der Hans zu reparieren plante  
 since it.ACC/the.ACC car the.NOM John to repair planned  
 “since John planned to repair it/the car”
- (c) \*weil der Wagen zu reparieren geplant wurde  
 since the.NOM car to repair planned was  
 “since they planned to repair he car”
- (10) (a) Sono-shisutemu-ga tsukai hajime-rare-ta  
 new-system-NOM use begin-PASS-PAST  
 “The system began to be recognized.” (Fukuda 2007, 175; [32b])
- (b) ?Dare<sub>i</sub>-o soitu<sub>i</sub>-no hahaoya-ga Michael-ni  
 who<sub>i</sub>-ACC he<sub>i</sub>-GEN mother-NOM Michael-DAT  
 PRO t<sub>i</sub> kubunisu-ru yoo(ni) tanon-da no  
 PRO t<sub>i</sub> fire-NONPAST YOO ask-PAST Q  
 Lit. “Whom, his mother asked Michael to fire.”  
 “His mother asked Michael who to fire.” [SW] [Nemoto 1993, 45; [35b)]
- (c) ?\*Taroo-ga Jiroo-ni kubinisu-ru yoo(ni) tanom-are-ta  
 Taro-NOM Jiro-DAT fire-NONPAST YOO ask-PASS-PAST  
 “They asked Jiro to fire Taro.” [Koji Shimamura, pers. comm.]

In the next sections, I lay out an approach that covers the diverse distribution in Table 1. Given the non-uniformity of LOM and CC/SCR, I propose that there are two types of restructuring—*size restructuring* and *voice restructuring*, which are in no implicational relation (but see below). Whereas, hypothetically, *size restructuring*, which involves the omission of certain clausal projections in an infinitival complement, is available universally, *voice restructuring* involves a language-specific *voice* head which is or is not part of the lexical inventory of a language. I will show that this approach is justified given the idiosyncratic behavior of LOM cross-linguistically.

As a final observation regarding the distribution of restructuring in Table 1, note that of the eight possible combinations (given the divergence of LOM and CC/SCR), six language types are attested. So far, I have no (clear) examples of Type A2 and Type D1 languages. Languages of Type A2 would be like Italian or Spanish in allowing CC/SCR from [−TNS] infinitives, but different in prohibiting LOM. The system I propose will

predict such languages to exist. In fact, some of the languages classified as LOM languages may fall into this category if the only passive allowed is reflexive (*se*) passive. In contrast to analytic (periphrastic) passive, *se* passive could involve a configuration in which the *embedded* verb is *se*-passivized, followed by CC of *se*, giving the (false) impression of LOM. I leave this issue open here.

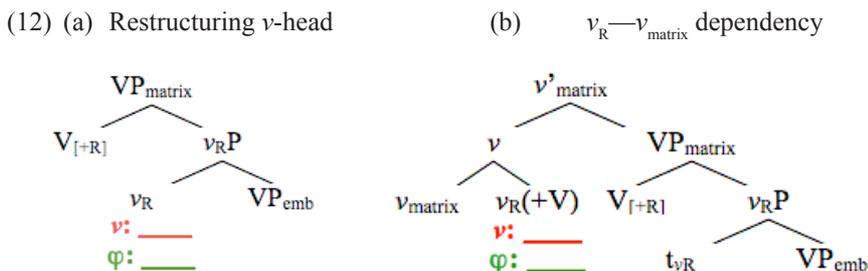
The existence of Type D1 languages would be theoretically more interesting. Among the languages investigated so far, there appears to be an implicational relation: if LOM is possible, CC/SCR is possible as well (but not vice versa). In an approach such as Wurmbrand (2001), this could be seen as the result of different degrees of restructuring. LOM requires the largest degree of clause-union, which is analyzed there as bare VP-complementation (the embedded clause lacks all functional projections, including *vP*). CC/SCR, on the other hand, which can escape even from [+FUT] infinitives in certain languages, does not require restructuring to such an extent; it could be assumed, for instance, that CC/SCR is blocked across CPs, and in some languages TPs, but not across *vPs* (however those distinctions are derived). This then entails that whenever LOM is possible, CC/SCR should be possible as well, since the contexts allowing the former (bare VPs) are a subset of the contexts allowing the latter (VPs, *vPs*, %TPs). To capture the entire distribution in Table 1, however, some crucial questions would remain: How is the difference between Type #1 and Type #2 languages derived? How is CC/SCR across [+FUT] infinitives allowed and why only in some languages? How are Type D languages handled? Depending on the answer to these questions, an implicational relation between LOM and CC/SCR may or may not be expected. The account I propose in this article will be compatible with the existence of D1 languages, thus making LOM and CC/SCR entirely independent of each other. Further empirical research will show whether this direction is warranted.

### 3. Voice Restructuring

In this section, I provide a summary of the analysis of voice restructuring which is argued for in more detail in Wurmbrand (2013). In order to derive LOM, the embedded predicate should not involve structural Case for the embedded object, nor any embedded subject intervening between the object and the matrix Case assigner. As I now show, a VP-complementation structure (Wurmbrand 2001) straightforwardly achieves this. However, such an analysis leaves open the following questions: (i) why is LOM not available in all languages (see the difference between Dutch and German in (8), for instance); (ii) why is LOM often restricted to certain matrix verbs (e.g., in Spanish *finish* allows LOM as shown in (11a), but *try* does not, (11b), although a *try*-infinitive allows CC in Spanish as shown in (11c), and, as we have seen in (8c), (9a), *try* allows LOM in German); and (iii) how does the control interpretation arise (i.e., in LOM contexts, the implicit matrix agent must also be understood as the agent of the embedded predicate)?

- (11) (a) Las casas fueron acabadas de pintar ayer  
 the houses were finished to paint yesterday  
 “They finished painting the houses yesterday.” [SW]  
 (Aissen and Perlmutter 1983, 391; [P33b])
- (b) \*Las paredes fueron tratadas de pintar ayer  
 the walls were tried to paint yesterday  
 “They tried to paint the walls yesterday.” [SW]  
 (Aissen and Perlmutter 1983, 391; [P36b])
- (c) Luis las trató de comer  
 Luis them tried to eat  
 “Luis tried to eat them.” (Aissen and Perlmutter 1983, 363; [12b])

The analysis provided in Wurmbrand (2013) takes as a starting point the observation that in restructuring constructions in many Austronesian languages the embedded predicate obligatorily occurs with voice marking. Furthermore, in Chamorro (Chung 2004), the RI also displays subject agreement and separate transitivity marking from the matrix predicate (e.g., the matrix predicate inflects as an intransitive whereas the embedded predicate inflects as a transitive, or vice versa). Assuming that such morphology is associated with syntactic heads, there is strong evidence that restructuring complements involve a functional projection, specifically a voice projection. The analysis given there is illustrated in (12).



As shown in (12a), RIs involve a  $v$ -head ( $v_R$ ), however a  $v_R$  which is unspecified for  $j$ - and  $v$ -values. As a consequence  $v_R$  cannot select a subject (only a  $v_{AGENT}$  can introduce an explicit subject) nor assign ACC case, which I assume is also tied to a  $v_{AGENT}$  feature. Thus, like the bare VP-complementation approach, my  $v_R$  approach straightforwardly provides the structural context for LOM. It improves on the VP-complementation approach, however, in allowing  $v$ -material, in providing a way to implement the

idiosyncratic properties of LOM, and in deriving the shared subject interpretation. The presence of two  $v$ -heads thus immediately accounts for the possibility of voice and transitivity marking in RIs.<sup>5</sup> Since  $v_R$  is a lexical item, it is expected that it is not available in all languages, which accounts for the difference between Type #1 and #2 languages:  $v_R$  is available in the former but not the latter.

Furthermore, since the matrix  $V$  selects  $v_R$ , it is expected that the verbs which do so vary cross-linguistically. Thus German *versuchen* ‘try’ would be equipped with the  $v_R$  selecting feature/property, whereas Spanish *tratar* lacks it. The variation, however, is not entirely arbitrary. Since selection is a local process, matrix  $V$ s selecting  $v_R$  must combine with  $v_R P$  directly. Therefore, only  $V$ s that are semantically compatible with a  $[-TNS]$  complement can merge with  $v_R P$ , and matrix verbs that require a  $[+FUT]$  infinitive exclude a bare  $v_R P$  complement, and as a consequence LOM.<sup>6</sup> Selection of  $v_R$  thus accounts for the general unavailability of LOM from future infinitives (cf. Table 1).

To see how the shared subject interpretation arises, consider the next steps of the derivation following (12a). To acquire valued features,  $v_R$  must enter a local dependency with the matrix  $v$  and matrix subject, which I represent here as  $v$ -incorporation, (12b) (I leave open here whether incorporation must take along the matrix  $V$  or can skip it).

At this point, the embedded and matrix  $v$ -heads act like a single head, in that they share all features and thematic associations (see Wurmbbrand [2013] for a comparison of this approach with traditional clause union approaches involving complex head formation). For instance, if the matrix  $v$  is active, it is valued as AGENT and the  $j$ -features of both  $v$ 's are valued by the NP which is subsequently merged with  $v'_{matrix}$ , thereby associating both predicates with the same agent subject. Similarly, if the matrix  $v$  is passive, it can be assumed following Legate (2010; 2012), that the matrix  $v$  is inserted with lexically valued  $j$ -features corresponding to the features of an (implicit or oblique) agent. The embedded  $v_R$  then inherits those features from matrix  $v$  via feature valuation, and a shared subject interpretation is again derived.

In sum, the *voice restructuring* approach is a hybrid account incorporating core features of a complex head approach and a VP-complementation approach to restructuring. This allows us to encode the idiosyncratic properties of LOM, achieve a larger empirical coverage than previous accounts (e.g., the account extends to languages with voice marking in a RI), and also improve in several respects on the theoretical details of previous analyses (such as the derivation of the subject interpretation).

5 See Wurmbbrand (2013) for the difference between voice matching and default voice marking languages.

6 This implication is based on the assumption that future is represented syntactically (see Wurmbbrand [2014] for motivation).

## 4. Size Restructuring

To account for the distribution of CC and SCR, I propose that infinitives can involve a truncated structure, which I will refer to as *size restructuring*. Concretely, there are two ways in which an infinitive can differ from a finite clause: infinitives can project only up to  $vP$ , omitting TP; and infinitives can omit the  $A'$ -domain above TP. While CPs are uncontroversial  $A'$ -projections (cf. the  $A'$ -properties of movement targeting CPs, such as *wh*-movement or topicalization), the  $A/A'$ -status of the landing sites of SCR/CC is less obvious. But in any case, both options appear to be available cross-linguistically. A difference in the  $A/A'$ -status of SCR/CC then has interesting consequences for *size restructuring*, which I argue affects only the  $A'$ -domain of the clause. This will be discussed in the next subsection.

Not projecting a TP is only possible in  $[-TNS]$  infinitives, since future infinitives require a structurally present TP-head such as T or Mod (see Wurmbrand [2014] for arguments for the syntactic presence of a future modal element in  $[+FUT]$  infinitives). Infinitives such as (1c) can thus be bare  $vPs$  (or  $AspPs$ ), which immediately accounts for the transparency of those infinitives in Type A, B, C languages (in what follows Types A–D refer to the classifications in Table 1). I assume that size restructuring (such as not projecting a TP) is available universally, thus also in Type D languages, but in these languages CC/SCR is blocked even from  $vP$  infinitives. I return to the reason for the unavailability of CC/SCR and motivation for *size restructuring* in Type D languages in Section 4.3.

### 4.1 Type A vs. Types B, C Languages: $\Sigma P$ Is an A or an $A'$ -Projection

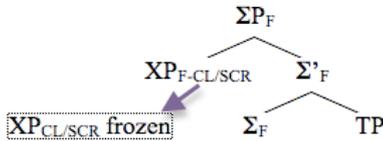
Assuming that future is encoded in a TP,  $[+FUT]$  infinitives must project at least up to TP, whereas  $[-TNS]$  infinitives can project only to  $vP$  as shown in (13a) (I use the symbol  $\gg$  to indicate the projection line of an infinitive). *Size restructuring* in  $[+FUT]$  infinitives then has the effect that any  $A'$ -projection above TP can be omitted. I argue that the crucial property distinguishing Type A from Type B and C languages is the A vs.  $A'$ -nature of TP-external clitic/scrambling positions, which I label  $\Sigma P$  here (see below for details). In Type B, C languages,  $\Sigma P$  is an  $A'$ -projection, and it can hence be omitted together with CP as shown in (13b). In Type A languages, on the other hand,  $\Sigma P$  is an A-projection part of the TP-domain, and thus cannot be omitted in  $[+FUT]$  infinitives.

- (13) (a)  $[-TNS]$ :  $vP \gg VP$  (all)
- (b)  $[+FUT]$ :  $(CP \gg \Sigma P_{A'}) \gg TP_{FUT} \gg vP \gg VP$  (B, C)
- (c)  $[+FUT]$ :  $(CP) \gg [* (\Sigma P_A) \gg TP_{FUT} ] \gg vP \gg VP$  (A)

Following Sportiche (1996), I propose that clitics are base-generated (roughly) in their surface positions, as the head of  $\Sigma P$ , and licensed by a *pro* argument moving to Spec,

$\Sigma P$ . The base-generated clitic and the moved  $pro_{\text{Clitic}}$  enter a mutual feature dependency, and as a consequence,  $\Sigma$ ,  $\Sigma P$ , and XP in Spec,  $\Sigma P$  are identical in their feature content as shown in (14). More specifically, I assume that the XPs ( $pro_{\text{Clitic}}$  and, as we will see below, also scrambled XPs) are inserted in their base-positions without j-values, whereas  $\Sigma$  is inserted with j-values but no referential or theta-values/relations. A mutual feature valuation dependency between XP and  $\Sigma$  is thus necessary to (semantically) associate XP with j-values and  $\Sigma$  with an argument position.

(14) Future infinitives in Type A languages



Furthermore, I assume that such identity in semantic features between a specifier and the dominating projection as in (14) creates an A-over-A or freezing configuration for the XP in the specifier, which, following Rizzi (2006), I refer to as criterial freezing.<sup>7</sup> The specific derivation of criterial freezing is not crucial for this article; what is important is that clitics (and scrambling) involve a semantic feature dependency which leads to a configuration in which further movement of the involved element is impossible. This has the desired effect for blocking CC from [+FUT] infinitives in Type A languages: [+FUT] entails the presence of a TP, and since  $\Sigma P$  is part of the TP A-domain, it must be projected together with TP. The obligatory presence of the criterial  $\Sigma P$  in [+FUT] infinitives entails that clitics and  $pro_{\text{Clitic}}$  movement target the infinitive-internal  $\Sigma P$  which then freezes  $pro_{\text{Clitic}}$  in this position as shown in (14).

In Type B, C languages, on the other hand, it is possible to not project  $\Sigma P$  in an infinitive, since  $\Sigma P$  is an A'-projection, which is part of the CP-domain.  $\Sigma P$ -associated XPs then move to the matrix  $\Sigma P$ , yielding CC<sup>8</sup> or inter-clausal SCR. The A/A'-difference is motivated, among other factors, by parasitic gaps, which, as shown in (15a), are licensed by CC (also SCR) in a Type B language like Dutch, but not in a Type A language like Italian as in (15b).

<sup>7</sup> Feature sharing between a specifier and a head (and thus dominating projection) does not always lead to freezing (e.g., successive cyclic *wh*-movement, which in many accounts is triggered by a feature in C, is possible, as long as the embedded C is not interrogative—i.e., as long as no semantic features are shared; see also Note 10).

<sup>8</sup> Although the account here technically does not involve clitic climbing (only the associated  $pro$  undergoes movement), I will continue to use the term CC for inter-clausal clitic placement and  $pro_{\text{Clitic}}$  movement.

- (15) (a) dat ik ze [zonder in te kijken] aan Jan doorverkoop  
 that I them [without in to look] to Jan on.sell  
 “that I sold these books without looking into (them)” (Moskal, pers. comm.)
- (b) \*Glieli dobbiamo far mettere nello scaffale  
 them.him we.must make put on.the shelf  
 invece di lasciare sul tavolo  
 instead of leaving on.the table  
 “we must make him put them on the shelf instead of leaving (them) on the table” (Chomsky 1982, 65, [89b]; Sportiche 1996, 256, [60b])

Furthermore, negation embedded in a RI is possible in the Type B languages German and Polish (Sabel 2001; Wurmbrand 2001) but not in the Type A language Italian (Cardinaletti and Shlonsky 2004; see the online data file for examples). This follows if Neg(ation) is dependent on TP (see among others Zanuttini 1991): Neg entails TP and TP entails  $\Sigma$ P in Type A but not Type B languages. Hence, embedded negation and cc are incompatible in the former ( $\Sigma$ P creates a freezing effect), but not in the latter.

Lastly, European Portuguese provides interesting evidence for the account given in this essay. As shown in (16a), [+FUT] infinitives prohibit cc. However, cc becomes available when the clitic is an adjunct as in (16b). Given that adjuncts are A'-projections,  $\Sigma$ P<sub>Adjunct</sub> would also be an A'-projection, even in a Type A language. Hence *size restructuring* allows omitting  $\Sigma$ P<sub>Adjunct</sub>, which in turn allows cc.

- (16) (a) \*Não o decidi convidar  
 Not him.ACC I.decided invite.INF  
 “I didn’t decide to invite him.” (Barbosa 2009, 104; [in text])
- (b) Eu só lá decidi ir nesse dia  
 I only there I.decided go.INF this day  
 “I only decided to go there that day.” [SW] (Costa 2004, 47; [15a])

#### 4.2 Type B vs. Type C Languages: scr Is or Is Not Feature Driven

As indicated in (14), I assume, again following Sportiche (1996), that scr in Type A and Type B languages also targets Spec,  $\Sigma$ P ( $\Sigma$  being phonologically empty in this case). As a result, scr, like cc, is blocked whenever the presence of  $\Sigma$ P is forced in the embedded clause. In Type B languages, one such context is given by embedded finite clauses which, as we have seen in (5), prohibit cc/scr across the CP. In finite clauses no *size restructuring* takes place and the A'-domain (CP» $\Sigma$ P) must hence be projected (cf. [17a]). Scrambling, like movement of *pro*<sub>Clitic</sub>, involves a mutual feature dependency

between  $XP_{SCR}$  and  $\Sigma$ , which creates an A-over-A/criterial freezing configuration. Since scrambled XPs are frozen in Spec,  $\Sigma P$ , no further long-distance SCR is possible from finite clauses in Type B languages (cf. [17b]).<sup>9</sup>

(17) (a)  $CP_{FIN} \gg \Sigma P \gg TP_{FUT} \gg vP \gg VP$

(b)  $[_{CP-FIN} *SCR [_{\Sigma P-F} SCR_F/CC_F \gg TP_{FIN} \gg vP \gg VP ]]$

Although Type B languages do not allow LDS from finite clauses, other types of A'-movement are available in these languages, illustrated by the topicalization examples in (18) from German and Polish (corresponding examples with LDS are impossible; see the data file). Given that SCR is A'-movement in Type B languages (cf. Grewendorf and Sabel 1994; 1999; Szczegielniak 2001), the puzzle has been why certain types of A'-movement can escape a CP but others cannot.

(18) (a) Den Frosch hat der Hans geglaubt  
 the.ACC frog has the.NOM John believed  
 habe nur die Maria geküsst  
 has.SUBJ only the Mary kissed  
 "The frog, John believes only Mary (has) kissed."

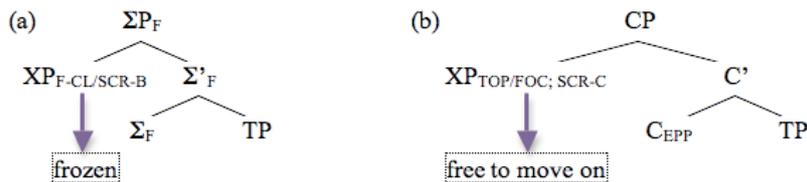
(b) Żabę to Jan chciałby żeby tylko Maria pocałowała  
 frog.ACC TOP John want.SUBJ that.SUBJ only Mary.NOM kissed  
 "The frog, John would like only Mary to kiss." [Marcin Dadan, pers. comm.]

The freezing approach proposed here accounts for this difference as follows: SCR creates semantic feature identity between the specifier and dominating projection in Type B languages as in (19a), hence freezing arises. However, topicalization does not involve a semantic feature dependency between the XP undergoing topicalization and the moved to head (i.e., contra Rizzi [1997] *et seq.*, topic projections do not involve "criterial" features). Following much recent work (for instance Neeleman and Koot [2008], Fanselow and Lenertová [2011], among many others), information structure properties (such as "topic," "focus") cannot be seen as being formally responsible for movement. Rather, I agree with these works, which argue that topicalization is movement to Spec, CP formally triggered by an EPP/EDGE feature of C requiring a specifier (see Frey 2005, Fanselow and Lenertová 2011). Since in a configuration like (19b) no semantic feature dependency is involved in the CP,

<sup>9</sup> Due to the mutual feature dependency that  $XP_{SCR}$  and  $\Sigma$  must enter,  $XP_{SCR}$  can also not move directly to Spec, CP, skipping Spec,  $\Sigma P$ , since it cannot be licensed by C.

no A-over-A/criterial freezing configuration is created, and hence topic/focus XPs can pass through Spec, CP.<sup>10</sup>

(19)



This brings us to Type C languages, which allow SCR out of [+FUT] infinitives, but in contrast to Type B languages, also allow LDS across finite CPs (cf. [6b]). The structures I propose for finite and non-finite embedded clauses in Type C languages are given in (20).

(20) (a) Finite:  $[_{CP} SCR [_{\Sigma P-F} CC_F \gg TP.FIN \gg vP \gg VP ]]$

(b) Infinitive:  $(CP \gg \Sigma P \gg) TP.FUT \gg vP \gg VP$

I will discuss (20a) first and return to (20b) below. As shown in (20a), SCR in Type C languages, like topicalization in Type B languages, is “free” in that it does not involve a semantic feature dependency in  $\Sigma P$ . Put in terms of features, scrambled XPs are always inserted with j-values in Type C languages. Thus, whether movement proceeds through Spec,  $\Sigma P$  or not (I leave open details of the locality within the left periphery), no freezing effect arises in  $\Sigma P$ , and (further) movement to Spec, CP is possible as in (20a), which can be followed by LDS to the matrix clause.

To motivate the difference between SCR in Type B vs. Type C languages, it may be tempting to assume that Type C languages lack  $\Sigma P$  altogether. For languages like Korean or Japanese, which do not have clitics, this may indeed be the most appropriate structure. However, Serbo-Croatian and Slovenian provide evidence for a structure such as in (20a), that is, a structure in which SCR does not target  $\Sigma P$  (is not triggered by semantic features) despite  $\Sigma P$  being present in the language.

Since the notion of finiteness is controversial in Serbo-Croatian, I only discuss Slovenian here (the following points have all been made in Marušič [2005] already). As shown in (21a,b) (also [6a]), Slovenian allows CC and SCR out of [+FUT] infinitives.

10 Embedded interrogative CPs are, of course, different since in these cases there is semantic feature identity between C and the *wh*-phrase in Spec, CP (*wh* and/or Q features are interpretable), leading to an A-over-A/freezing configuration. Cases such as *\*What do you wonder \_\_ Bill bought?* are then correctly excluded.

Furthermore, SCR is possible out of finite complements (see [21c] and [6b]). However, in contrast to SCR, CC is prohibited across a finite clause boundary as shown in (21d). Thus, CC, but not SCR shows the familiar  $\Sigma$ P freezing effect, which follows under the structure in (20a): *pro*<sub>Clitic</sub> targets Spec,  $\Sigma$ P which creates a freezing configuration; SCR, on the other hand is not driven by a semantic feature (does not target  $\Sigma$ P), and hence can pass through/across Spec,  $\Sigma$ P to Spec, CP.

- (21) (a) Peter se ga je odločil naučiti manir  
 Peter REFL him AUX decided teach.INF manners  
 “Peter decided to teach him some manners.” (Marušič, pers. comm.)
- (b) Janeza se je Peter odločil naučiti manir  
 Janez.ACC SE AUX Peter decided teach.INF manners  
 “John, Peter decided to teach some manners.” (Marušič, pers. comm.)
- (c) ?Janeza se je Peter odločil da nauči manir  
 Janez.ACC SE AUX Peter decided that teach manners  
 “John, Peter decided that he would teach some manners.” (Marušič, pers. comm.)
- (d) \*Peter se ga je odločil da nauči manir  
 Peter SE him AUX decided that teach manners  
 “Peter decided that he would teach him some manners.” (Marušič, pers. comm.)

The account proposed here derives the observation that CPs generally block CC (see, for instance, Bondaruk [2004] for Polish, Marušič [2005] for Slovenian, Dotlačil [2006] for Czech). CPs do not directly block CC, but rather the presence of CP is an indication that no *size restructuring* has taken place, which then necessitates a  $\Sigma$ P in the embedded clause, which, in turn, creates a freezing configuration, thus blocking CC. The fact that CPs do not necessarily block SCR but always block CC (again indirectly) suggests that clitics always involve a feature dependency in  $\Sigma$ P.

Type C languages like Slovenian are interesting for another reason: they provide evidence for *size restructuring* as a mechanism available in infinitives cross-linguistically, i.e., the structure in (20b). Given that Type C languages allow LDS across finite clauses, a reasonable conjecture would be to assume that in these languages, CPs are not domains (e.g., not phases) in the same way as in Type B languages. The fact that CC is possible out of infinitives in Type C languages could then be treated as just another case of CPs being permeable in these languages. However, this would not account for the difference in the availability of CC between finite clauses and infinitives. CC across a finite CP is impossible in Slovenian, thus, CPs do constitute domains in the relevant sense. On the other hand, if *size restructuring* is available in all languages, this

difference is expected: only if restructuring applies as in (20b)—i.e., if the A'-domain is not projected—can CC escape from an embedded clause. In all other cases where a CP is mandatory,  $\Sigma P$  is required as well, and CC is prohibited due to the freezing effect arising in  $\Sigma P$ .

A final piece of evidence for this approach, in particular the structure in (20b) comes from a well-known observation about scrambling from infinitives in Type C languages. While LDS from finite clauses is necessarily A'-SCR, SCR from infinitives can be A-SCR in Type C languages. This can be seen, for instance, by the different behavior of SCR regarding WCO effects. As shown in (22a) from Slovenian, LDS from finite clauses yields a WCO violation (see also, among others, Saito [1985], Nemoto [1993] for Japanese, Bošković [1997] for Serbo-Croatian).

(22) (a) Janez<sub>i</sub> je njegov<sub>j/\*i</sub> oče reku da ne igra golmana  
 Janez<sub>i,NOM</sub> AUX his<sub>j/\*i</sub> father said that not play goalie  
 "John<sub>i</sub>, his<sub>j/\*i</sub> father said doesn't play goalie." (Marušič 2005, 15; [22a])

(b) Janeza<sub>i</sub> je njegov<sub>i</sub> oče sklenil poslati v semenišče  
 Janez<sub>i,ACC</sub> AUX his<sub>i</sub> dad decided send<sub>INF</sub> to theological.seminary  
 "His<sub>i</sub> father decided to send John<sub>i</sub> to the theological seminary."  
 (Marušič 2005, 15; [24a])

Scrambling from infinitives as in (22b) (see also [10b] from Japanese), on the other hand, is fully grammatical under the interpretation given. The WCO violation in (22a) arises since the embedded clause is a CP, and SCR has to be successive cyclic A'-movement. Movement to Spec, CP must be A'-movement, and further A-movement would be excluded as *improper movement*. The situation is different in infinitives which can have the structure in (20b). The lack of a WCO violation then follows: *Size restructuring*, which is possible in infinitives but not in finite clauses, truncates the embedded clause to its A-domain. Thus movement from the embedded clause to the matrix vP can be A-movement, which does not create a WCO configuration and allows binding of the moved XP into the matrix subject at this stage of the derivation (further movement to matrix  $\Sigma P$  is then again A'-movement).

### 4.3 Types A, B, C vs. Type D Languages

The remaining variation in Table 1 concerns languages which do not allow CC/SCR from any kind of infinitive. I propose that this, too, is attributed to the properties of  $\Sigma P$ , in this case the location of  $\Sigma P$ . Cardinaletti and Shlonsky (2004) show that Italian has two clitic positions—one within the vP, one above TP. When the lower position is chosen, no CC takes place. Since the lower  $\Sigma P$  is within the vP-domain, it is necessarily an A-projection. I propose that in Type D languages, only the low position is available,

yielding the structure in (23a). Assuming that RIs always involve a *v*-head (see Section 3 and Wurmbrand 2013), Type D languages must project  $\Sigma P$  in infinitives, even in infinitives that do not project a TP. Since infinitives always involve a  $\Sigma P$ , freezing occurs and CC is prohibited from any type of infinitive.

(23) (a) [-TNS]:  $vP \gg *(\Sigma P) \gg VP$

(b) [+FUT]:  $TP_{FUT} \gg vP \gg *(\Sigma P) \gg VP$

As shown in (23a) vs. (23b), I assume that *size restructuring* can nevertheless apply in infinitives in Type D languages. Although this in itself does not allow CC/SCR (due to the obligatorily low position of  $\Sigma P$ ), we do expect to still find effects of restructuring. And this is indeed the case. Whereas [+FUT] infinitives (and finite clauses) constitute opaque domains, [-TNS] infinitives are transparent for various dependencies cross-linguistically (e.g., scope, NPI-licensing, negative concord). An example is given from Brazilian Portuguese.

(24) (a) \*A Lina (não) decidiu sair nunca (mais)  
 The Lina (not) decided leave.INF never (more)  
 “Lina decided/didn’t decide never to leave.” (Modesto 2013, 14; [16a,b])

(b) A Lina decidiu não sair nunca (mais)  
 The Lina decided not leave.INF never (more)  
 “Lina decided never to leave.” (Modesto 2013, 14; [16c])

(25) (a) A Lina não tenta ajudar nunca à sua mãe  
 The Lina not tries help.INF never to her mother  
 “Lina never tries to help her mother.” (Modesto 2013, 14; [17a])

(b) A Lina não começa a estudar nunca  
 The Lina not start to study.INF never  
 “Lina never starts to study.” (Modesto 2013, 14; [17b])

As shown in (24), a [+FUT] infinitive allows NPIs such as *nunca* “never” only when negation occurs in the embedded clause. On the other hand, NPIs in [-TNS] RIs such as (25), can be licensed by negation in the matrix clause. Assuming that the NPI domain in Brazilian Portuguese is the TP, this difference follows: while [+FUT] infinitives are TPs and hence embedded NPIs need to be licensed within the embedded clause, [-TNS] infinitives can be *vPs* which makes the matrix TP the closest TP and thus the domain for embedded NPI licensing.

## 5. Conclusion

In this article, I have summarized the distribution of restructuring in 23 languages. I have shown that six (possibly eight) types of languages have to be distinguished regarding the distribution of LOM, CC, and SCR. I have proposed that there are two types of restructuring (*voice* and *size restructuring*) and, more specifically, that the cross-linguistic diversity is derived from the following four properties: (i) a language has (Type #1) or does not have (Type #2) a restructuring *v*-head; (ii) clitics and/or scrambling always target an A-projection (A, D) or can also target an A<sup>2</sup>-projection (B, C); (iii) a language has (A, B, C) or does not have (D) a *v*P-external  $\Sigma$ P (i.e., clitic/scrambling projection); and (iv) scrambling is (A, B, D) or is not (C) driven by semantic features. The conclusions reached in this work have consequences for theories of clause structure, locality and the make-up of the *voice* domain, as well as the syntax of clitic constructions and scrambling.

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# **Linguistic Structure: Focus on Slavic**



# Against a Unified NP-Deletion Analysis of Pronouns: Evidence from Demonstratives in Czech

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**Abstract:** We argue that not all demonstrative pronouns are of type *e*. Instead, some of them may be of type  $\langle e, t \rangle$ . While  $\langle e, t \rangle$  pronouns are a grammatical realization of elided nP/NP, where nP/NP denotes a maximal nominal projection lacking D', pronouns of type *e* may come about via two distinct routes: (i) either they are an overt realization of an elided DP in the sense of Postal (1969), Elbourne (2005), etc. (with the caveat that the actual functional projection may represent a different set of  $\phi$ -features, see Déchaine and Wiltschko [2002], among others); or (ii) they are a morphological realization of a more complex structure, namely, nP/NP + variable structure introduced by movement.

**Keywords:** internal structure of DP; pronouns; variable binding; Czech.

## 1. The Puzzle

This paper investigates the syntactic distribution and morphological and semantic properties of the Czech demonstrative pronoun *to*, with “it” being its closest English equivalent.<sup>1</sup> The generalized form of the pronoun is *t-a*, where *t-* roughly corresponds to the English *th-* (as in *this, that, there, then . . .*), while *-a* reflects  $\phi$ -features of the actual surface form of the pronoun. Thus, we get a set of distinct surface forms based on this pattern, such as *t-en* (M.SG), *t-a* (F.SG), *t-o* (N.SG), *t-i* (MA.SG), etc.<sup>2</sup>

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2 We use the following abbreviations: M: masculine, F: feminine, N: neuter, MI: masculine inanimate, MA: masculine animate, SG: singular, PL: plural, PP: past participle, AUX: auxiliary, IMP: imperative, REFL: reflexive clitic, NOM: Nominative, INSTR: Instrumental, CL: 2nd position clitic.

The observation we begin our investigation with is that the surface morphological form of *TO* depends on where the pronoun appears in the syntactic structure. If it appears at the left periphery, then the pronoun may agree in  $\phi$ -features with its linguistic antecedent. However, if the pronoun appears lower in the structure (for the lack of a better term, let us call the position “middle-field”), the form of the pronoun is invariable *TO*, i.e., *N.SG*, irrespective of the  $\phi$ -features of its antecedent. Note that in Czech *N.SG* is the default morphological realization of weather predicates, i.e., a morphological default associated with failed Agree, instead of a morphological default associated with markedness. Our main empirical focus will be *TO* in so-called specificational copular clauses (Mikkelsen 2005; among others), though we will briefly touch upon other syntactic structures as well.

### 1.1 Invariable *To*

Examples in (1)–(2) demonstrate the basic distributional pattern of invariable *TO*. The examples in (1) show that if *TO* is in the middle-field, it may surface only in its invariable form. Agreement with its linguistic antecedent, here *kniha* “book.F.SG,” is not possible.

- (1) Dopsali           jsme           naši           knihu.  
 finished.PP       are.1PL       our           book.F.SG  
 “We have finished writing our book.”

- (a) Byl               to           román.  
 was.3.M.SG       TO.N.SG   novel.M.SG  
 “It was a novel.”

- (b) \*Byla           ta           román.  
 was.3.F.SG       TO.F.SG   novel.M.SG  
 [intended: *TO*: the book]

- (c) \*Byl           ta           román.  
 was.3.M.SG       TO.F.SG   novel.M.SG  
 [intended: *TO*: the book]

The examples in (2) further demonstrate that *TO* in the middle-field is fundamentally insensitive to the form of its linguistic antecedent. As the examples show, the form of the pronoun remains unaltered, irrespective of the gender and number of the antecedent, be it masculine singular as in *manžel* “husband” in (2a), feminine singular as in *dcera*

“daughter” in (2b), neuter singular as in *dítě* “child.M.SG” in (2c), or masculine animate plural,<sup>3</sup> if the pronoun refers to all of them as in (2d).

- (2) Představila nám svého manžela, svou dospělou  
 introduced-she to-us her husband.M.SG her adult  
 dceru, a její malé dítě.  
 daughter.F.SG and her small child.N.SG  
 “She introduced her husband, her adult daughter, and her little child to us.”

- (a) Byl to statný čtyřicátník.  
 was.M TO.N.SG well-built man-in-his-forties.M  
 “He was a well-built man in his forties.”

- (b) Byla to vynikající studentka.  
 was.F TO.N.SG excellent student.F  
 “She was an excellent student.”

- (c) Byl to moc milý chlapeček.  
 was.M TO.N.SG much sweet little-boy.M  
 “He was a really sweet little boy.”

- (d) Byli to moc příjemní lidé.  
 were.MA.PL TO.N.SG much nice people.MA.PL  
 “They all were really nice.”

Before we proceed to the second part of the pattern, note that in the examples we have considered so far the copular verb never agrees with invariable TO. Instead, it strictly agrees with the full DP in Nominative, as witnessed by (3).

- (3) (a) Byl to moc milý chlapeček.  
 was.M TO.N.SG much sweet little-boy.M  
 (b) \*Bylo to moc milý chlapeček.  
 was.N TO.N.SG. much sweet little-boy.M

3 In Czech if a plurality contains a referent in masculine animate, then it triggers masculine animate agreement, irrespective of the gender of other entities included in the plurality.

## 1.2 Agreeing *To*

The basic distribution of *TO* in the left periphery is shown in (4). As we see, if *TO* refers to its linguistic antecedent, here *kniha* ‘‘book. F.SG,’’ it must agree with it, as in (4a). In contrast, if the form is *TO.N.SG*, then the pronoun must refer to a situation, not to the linguistic antecedent, as seen in (4b). Examples in (5) demonstrate the same contrast for a masculine singular antecedent (*projekt* ‘‘project.M.SG’’).

- (4) Dopsali                      jsme                      naši                      knihu.  
 finished.PP                      are.1PL                      our                      book.F.SG  
 ‘‘We have finished writing our book.’’
- (a) Ta                              byla                              naším                              úkolem.  
 TO.F.SG.                              was.3.F.SG                              our                              task.M.SG  
 ‘‘It (= the book) was our task.’’  
 [TO: OK the book; \*event; \*situation]
- (b) To                              bylo                              naším                              úkolem.  
 TO.N.SG.                              was.3.N.SG                              our                              task.M.SG  
 ‘‘It (= that we finished writing the book) was our task.’’  
 [TO: \*the book; \*event; OK situation]
- (5) Dokončili                      jsme                      projekt.  
 finished.PP                      are.1PL                      project.M.SG  
 ‘‘We finished a/the project.’’
- (a) Ten                              byl                              naším                              zadáním.  
 TO.M.SG.                              was.3.M.SG                              our                              assignment.N.SG  
 ‘‘It was our assignment.’’  
 [TO: OK: the project; \*event; \*situation]
- (b) To                              bylo                              naším                              zadáním.  
 TO.N.SG.                              was.3.N.SG                              our                              assignment.N.SG  
 ‘‘It was our assignment.’’  
 [TO: \*the project; \*event; OK situation]

The glosses to (4) and (5) make a distinction between the antecedent being a situation or an event. The rationale for making this distinction is demonstrated by examples in (6). As we see in (6a), if the pronoun is in the middle-field, it cannot refer to the situation of finishing writing the book. Instead, it refers to the event of writing the book,

irrespective of whether the event is finished or unfinished. In contrast, if the pronoun is in the left periphery, as in (6b), we obtain the opposite interpretation.

- (6) Dopsali                   jsme                   naši                   knihu.  
 finished.PP           are. 1PL           our                   book.F.SG  
 “We have finished writing our book.”

- (a) Bylo                   to                   naším                   úkolem.  
 was.3.N.SG           TO. N.SG           our                   task.M.SG  
 OK: the event of writing a book (not finishing writing a book)  
 \* the situation of finishing writing the book

- (b) To                   bylo                   naším                   úkolem.  
 TO.N.SG.           was.3.N.SG           our                   task.M.SG  
 \* the event of writing a book (not finishing writing a book)  
 OK: the situation of finishing writing the book  
 “It was our task.”

Even though the difference is subtle, examples in (7)—a variant of (6) enriched by contextual information—highlights the interpretive difference. Since the middle-field invariable TO in (7a) refers to the event of writing the book, the continuation with the boss objecting to us finishing the book is felicitous. In contrast, since the left-peripheral variant of the pronoun, as in (7b), strictly requires the whole proposition (or more precisely, the minimal situation established by the proposition) as its antecedent, the same continuation becomes contradictory.

- (7) (Context: our task was to write a book but we were explicitly asked not to finish it in order to extend the funding)  
 We have finished writing our book.

- (a) Bylo                   to                   naším                   úkolem,  
 was.3.N.SG           TO. N.SG           our                   task.M.SG  
 OK: ale šéf se na nás teď zlobí, protože jsme to neměli dopsat.  
 “but our boss is upset because we were not supposed to finish it.”

- (b) To                   bylo                   naším                   úkolem,  
 TO.N.SG.           was.3.N.SG           our                   task.M.SG  
 # ale šéf se na nás teď zlobí, protože jsme to neměli dopsat.  
 “but our boss is upset because we were not supposed to finish it.”

Before we further proceed with investigating the paradigm, let us make a comment on the form of the full DP in Czech copular clauses. The reader familiar with the Slavic morphology might have noticed that the case of full DPs in our examples switches between Nominative and Instrumental. Though we do not fully understand what governs the distribution of case, what matters is that the case form seems to be optional, at least in a subset of examples we are interested in. For instance, the Instrumental DP in (6) (*naším úkolem*) can freely be replaced with its Nominative counterpart *naš úkol*, as in (6') below, without any change in the meaning and the properties of the pronoun.

(6') Dopsali                      jsme                      naši                      knihu.  
 finished.PP                      are.1PL                      our                      book.F.SG  
 "We have finished writing our book."

(a) Byl                      to                      náš                      úkol.  
 was.3.M.SG                      TO. N.SG                      our                      task.NOM.M.SG  
 OK: the event of writing a book (not finishing writing a book)  
 \* the situation of finishing writing the book

(b) To                      byl                      náš                      úkol.  
 TO.N.SG.                      was.3.M.SG                      our                      task.NOM.M.SG  
 \* the event of writing a book (not finishing writing a book)  
 OK: the situation of finishing writing the book  
 "It was our task."

The reason we chose Instrumental in the previous examples is because that if we use Nominative, the agreement of the copula changes. As the examples in (6) and (6') illustrate, if TO agrees with its linguistic antecedent in its  $\phi$ -features, then the copula agrees with the  $\phi$ -features of TO. Otherwise the copula agrees with the full DP in Nominative. In contrast, if there is no noun phrase the copula could agree with (either full DP in Nominative, or agreeing TO), then the copula surfaces with default  $\phi$ -feature agreement (N.SG).

### 1.3 Neuter Is Special

As we have seen in (4) and (5), TO agrees in  $\phi$ -features with its linguistic antecedent, be it feminine, or masculine, only if TO is in the left periphery. Crucially, the pattern changes if the antecedent is in neuter, as in (8). As these examples demonstrate, if the linguistic antecedent is in neuter singular, the left peripheral TO cannot agree with it. The conclusion holds irrespective of whether the copular verb is in neuter and the full DP is in Nominative, as in (8a), or whether the copular verb agrees with the DP in Nominative as in (8b), or whether the DP is in Instrumental and the copula is in neuter

as in (8c). Even though (8b) is slightly better than the other two examples, none of the logically possible combinations is fully grammatical.

- (8) Přivedla do obchodu malé dítě.  
 brought-she to store small child.N  
 “She brought a small child to the store.”
- (a) \*To bylo její synovec.  
 TO.N.SG. was.N her nephew.M.NOM
- (b) ??To byl její synovec.  
 TO.N.SG. was.M her nephew.M.NOM
- (c) \*To bylo jejím synovcem.  
 TO.N.SG. was.N her nephew.M.INSTR

Interestingly, the pattern in (8) does not result from a general ban on TO in neuter to refer to a linguistic antecedent. If TO is the subject of an adjectival predicate, or an argument of a non-copular verb, it may freely refer to a linguistic antecedent. As we see in (9a), if TO is the subject of an adjectival predicate and if it surfaces at the left periphery, it may either refer to the neuter antecedent *dítě* “child.N,” or it may refer to the situation of bringing the child to the store. (9b) exemplifies that TO as the subject of a non-copular verb may refer to a neuter antecedent as well.

- (9) Přivedla do obchodu malé dítě.  
 brought-she to store small child.N  
 “She brought a small child to the store.”
- (a) To bylo smutné.  
 TO.N.SG was.N sad.N  
 “(S)he was sad./It was sad.”  
 [TO: OK the child; OK the situation]
- (b) To plakalo.  
 TO.N.SG cried.N.SG  
 “(S)he cried.”

Note that there is no interesting difference between the linguistic antecedent being animate or inanimate. As (10) shows, we obtain the same contrast with inanimate objects. If TO is the subject, (10a), or the object, (10b), of a non-copular verb, it may refer to an

inanimate neuter antecedent. If, however, TO appears in a copular clause of the type we saw before, it cannot refer to its antecedent anymore, (10c–d).<sup>4</sup>

(10) Paní            přijela            do            obchodu            autem, . . .  
 Lady            arrived            to            store            car.N.INSTR  
 “The lady drove to the store . . .”

(a) Ale            to            se            rozbilo.  
 But            TO.N.SG            REFL            broken.N  
 “but it (= the car) broke.”

(b) Ale            to            cestou            zpátky            rozbila.  
 But            TO.N.SG            way            back            she-broke  
 “but she broke it on the way back.”

(c) \*To            bylo            nový            model.  
 TO.N.SG            was.N            new            model.M  
 “it was a new model.”

4 In (i) and (ii) we see possible continuations of (9) and (10), respectively, that seem to violate the generalization we put forward in the main text. In these examples, the full DP is a proper name (or a rigid designator like *mother* or *father*), i.e., a DP which must be referential (type *e*), unlike the full noun phrases we have considered so far.

(i) To            byla            Marie.  
 TO.N.SG            was.F            Marie.F  
 “It was Mary.”

(ii) To            byl            Mercedes.  
 TO.N.SG            was.M            Mercedes.M  
 “It was Mercedes.”

As we will argue in Section 2, the behavior of TO depends on its semantic type, and the examples in (i) and (ii) are crucially different from the core cases of specificational copular clauses discussed in the main text precisely in this respect. (ii) is an example of an equative clause, which has been argued to contain two referential arguments (Mikkelsen 2005; among others). Consequently, TO is semantically an argument similar to TO in (9b). In contrast, TO in (i) refers to a minimal situation involving a child being brought to the store by the woman. For reasons of space, we cannot go into more detail to support this claim; hopefully it may suffice if we point out that unlike the other cases we have considered in which TO referring to a child must have been translated to English as *he* or *she*, here the appropriate pronoun is *it*, which in English refers either to an inanimate object or a situation, but never to an animate antecedent.

|                       |       |      |         |
|-----------------------|-------|------|---------|
| (d) ??To              | byl   | nový | model.  |
| TO.N.SG               | was.M | new  | model.M |
| “it was a new model.” |       |      |         |

To summarize our observations so far, there are two main properties that need to be accounted for. First, if TO agrees with its linguistic antecedent in  $\phi$ -features, then TO must be in the left periphery. Second, there is an unusual restriction on the agreement properties of TO in the left periphery, namely, in specificational copular clauses TO may agree with a linguistic antecedent in masculine or feminine, but never in neuter. Interestingly, the restriction on agreement seems to hold only in copular clauses. There is no such restriction on neuter antecedents if neuter singular TO refers to a situation, or if it is an argument of an adjectival predicate or a non-copular predicate, or if it appears in an equative copular clause.

In this paper, we focus on the syntax and semantics of two TOS, namely, left-peripheral TO, as seen in (4), (5), (8), and (9), and invariable TO, which occurs in the middle-field, (1)–(2). We will argue that there are two types of left-peripheral TO: one of them agrees with its linguistic antecedent, while the other one refers to a minimal situation established by the previous discourse. We will argue that agreeing TO arises via movement of invariable TO. For reasons of space, we will leave invariable TO referring to events, and the difference between TO referring to a minimal situation and TO referring to an event, (6)–(7), for future research.

## 2. Untangling the Puzzle: *e* vs. $\langle e, t \rangle$

In order to analyze the proposed pattern, we will proceed in two steps. First, we will address the question of the difference between invariable TO and agreeing TO in an argumental position. With that being our baseline, we will then proceed to the question of the difference between agreeing TO in the left periphery and agreeing TO in an argumental position.

### 2.1 Towards a Morpho-semantic Generalization

We start with the observation that a definite noun phrase in an argumental position semantically denotes an individual (type *e*). This is not necessarily the case in copular clauses. In specificational and predicational copular clauses, nominal phrases, including definite ones, may denote a property (type  $\langle e, t \rangle$ ) (Mikkelsen 2005; Pereltsvaig 2007; Rothstein 2012; among others). Based on this observation, we can conclude that if neuter TO agrees with its linguistic antecedent, then it is of type *e* (but see note 4). The question that interests us is what this conclusion might mean for the structure of such a pronoun.

Before we can answer this question, let us consider agreement properties of invariable TO. First, as we have seen, invariable TO in copular clauses cannot agree with its linguistic antecedent. Second, invariable TO cannot trigger agreement on the copular

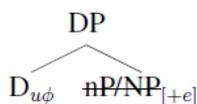
verb. We argue that this follows if invariable TO is  $\phi$ -feature deficient: as such it cannot get its  $\phi$ -features valued, neither can it value  $\phi$ -features of a potential goal. If this is a correct conjecture, it follows that there is a correlation between semantic type and agreement properties of TO, namely, only TO of type *e*, i.e., TO in an argumental position, agrees with its linguistic antecedent. In contrast, we argue that neuter TO in copular clauses<sup>5</sup> is of type  $\langle e, t \rangle$ , and consequently it cannot trigger Agree.<sup>6</sup>

If this generalization is correct, what is it about pronouns of type  $\langle e, t \rangle$  that makes them  $\phi$ -feature deficient?

In order to answer this question we will adopt two assumptions: (i) For a pronoun to be able to agree in  $\phi$ -features with its linguistic antecedent, such a pronoun must have unvalued  $\phi$ -features in the structure. (ii) Only D may introduce unvalued  $\phi$ -features to the structure.<sup>7</sup> It follows from these two assumptions that only a structure which contains D' projection may agree in  $\phi$ -features with its linguistic antecedent.

Taking this conclusion into account, we argue that only argumental pronouns of type *e* have D' projection, i.e., they are elided DPs in the sense of Postal (1969) and Elbourne (2005).<sup>8</sup> More precisely, it is the nP/NP part of the tree which is elided because it has a linguistic antecedent, and consequently it carries a [+e] feature in the sense of Merchant (2001), i.e., a feature that instructs phonology not to pronounce the structure if and only if an identical syntactic structure can be identified in the previous discourse. The actual morphological insertion is determined by the valued features on D and the [+e] feature that we argue is the source of the definiteness marking on the pronoun (i.e., the *t*-part of the pronoun). The corresponding syntactic structure is given in (11). What appears to be a neuter singular form is a result of the lack of  $\phi$ -features in the representation.

(11) The proposed structure of argumental TO:



5 We put aside situation-referring TO for now but will come back to it later.

6 See Hellan (1986), Rullmann and Zwart (1996), Danon (2012), and den Dikken (2014), among others, for a similar empirical generalization.

7 In principle, idiosyncratic  $\phi$ -features might occasionally come valued from the lexicon, and consequently appear on lower functional heads (Kramer 2009; Kučerová 2014), but since pronominal  $\phi$ -features must start as unvalued, they are introduced by D.

8 For instance, if the discourse contains  $[_{DP} \text{ a } [_{nP/NP} \text{ girl}]]$ , then the pronoun *she* corresponds to  $[_{DP} \text{ the } [_{nP/NP} \text{ girl}]_{[+e]}]$ , with only the nP/NP having an identical antecedent because D is indefinite in the antecedent but definite in the latter structure. Consequently, the lexical content of NP is not realized by the PF module. Instead, it is only the  $\phi$ -features on D in the context of the elided NP that are morphologically realized as a pronoun.

In contrast, we argue that invariable *TO* lacks the D'-layer which is necessary for the pronoun to be able to agree with its linguistic antecedent. This type of pronoun contains only the nP/NP projection that gets elided because of the presence of the [+e] feature. More precisely, the pronoun is a default morphological realization of [+e] in a nominal context.

(12) nP/NP<sub>[+e]</sub> ⇒ invariable *TO*

The proposed distinction gives us the relevant correlation between agreement and semantic types. If we assume that D' is necessary for the pronoun to be interpreted as an individual (Winter 2001; among others), and if D is the structural source of unvalued  $\phi$ -features, only a structure that contains D can agree with its antecedent. Since invariable *TO* is nP/NP, it follows that it cannot agree with a linguistic antecedent because it does not have D, i.e., it does not have  $\phi$ -features that could be valued. Furthermore, only argumental neuter *TO* has D, i.e., it contains  $\phi$ -features that can be valued, and consequently it can trigger agreement on the verb.

## 2.2 The Second Part of the Puzzle: Agreeing *To* in the Left Periphery

Recall that if *TO* appears in the left periphery it may agree with its linguistic antecedent, but only if it is masculine or feminine.<sup>9</sup> This pattern raises at least two questions. First, is agreeing *TO* of type *e*, i.e., the same type as an argumental pronoun? Second, if so, why does the left-peripheral *TO* agree with its antecedent in masculine and feminine, but not in neuter?

To answer the first question is not straightforward. In some respects, this pronoun shares distributional properties with other noun phrases denoting individuals. For instance, it may be an argument in a predicative copular clause, as in (13a), i.e., it may appear in a syntactic position which can be occupied by a personal pronoun, as in (13b), a definite individual denoting DP, as in (13c), but not by its invariable counterpart, as witnessed by (13d–e). The problem is that we cannot be sure that the pronoun in (13a) is not the argumental version of *TO*. Unfortunately, we do not really know at this point how to tell the two types apart. Even though the correlation is suggestive, it is far from conclusive.

|                                     |       |       |              |
|-------------------------------------|-------|-------|--------------|
| (13) Představila                    | nám   | svého | manžela.     |
| introduced.PP.F.SG                  | to-us | her   | husband.M.SG |
| “She introduced her husband to us.” |       |       |              |

<sup>9</sup> Putting aside the situational and argumental versions, of course.

- (a) Ten                      byl                      chytrý.  
 TO.M.SG                      was.M.SG                      smart.M.SG  
 “He is/was smart.”
- (b) On                      byl                      chytrý.  
 He                      was.M.SG                      smart.M.SG  
 “He is/was smart.”
- (c) Její                      manžel                      byl                      chytrý.  
 Her                      husband                      was.M.SG                      smart.M.SG  
 “Her husband is/was smart.”
- (d) \*Bylo                      to                      chytré.  
 was.N.SG                      TO.N.SG                      smart.N.SG  
 (intended: “He is/was smart.”)
- (e) \*Byl                      to                      chytrý.  
 was.M.SG                      TO.N.SG                      smart. M.SG  
 (intended: “He is/was smart.”)

Even though we cannot determine for sure the semantic type of the left peripheral agreeing TO, there are distributional facts we can establish with more certainty. The fact crucial for the analysis to be proposed is that agreeing TO is rather high in the structure. Specifically, it is higher than TP and most likely higher than CP. For concreteness, we propose that agreeing TO is in Top(ic)P. The evidence comes from the observation that agreeing TO cannot, unlike its invariable counterpart, be embedded in exclamative clauses, which disallow CP recursion. At the same time, it may appear in imperatives with a very similar meaning. We see the contrast in (14). (14a) is the baseline, with the target antecedent *podporu* “welfare.F.SG” realized as a full DP. (14b) shows that if the full DP is replaced with invariable TO, the exclamative clause is grammatical. If, however, we attempt to replace the full DP with agreeing TO, as in (14c), the sentence becomes ungrammatical. That there is no intrinsic semantic problem with having agreeing TO in the structure is demonstrated by (14d); since the imperative structure in (14d) does not impose restrictions on embedding the way (14c) does, agreeing TO in the imperative structure is grammatical.

- (14) (a) Ne    abys                      zase    utratil    všichni    podporu.  
 Not    that-AUX.2SG    again    spent    all    welfare.F.SG  
 “Just don’t spend the whole welfare payment again.”

- (b) Ne            abys                    to            zase            utratil.  
 Not            that-AUX.2SG            TO.N.SG            again            spent  
 “Just don’t spend it again.”
- (c) \*Ne            abys                    tu            zase            utratil.  
 Not            that-AUX.2SG            TO.F.SG            again            spent  
 “Just don’t spend it again.”
- (d) Tu            zase                    ne-utrat’.  
 TO.F.SG            again                    not-spend.IMP  
 “Don’t spend it again!”

As for situation-referring TO, since it is not at the center of our investigation, we only note that it is not subject to the same restrictions on embedding. Furthermore, since situation referring TO precedes 2nd position clitics and follows complementizers,<sup>10</sup> we assume it resides in the TP domain. More precisely, we assume that situation referring TO is overt morphological mapping of a situational pronoun on T (Percus 2000; von Stechow and Heim 2007/2011). However, a full analysis supporting this claim will have to wait for another occasion.

### 3. Variables in Morphology

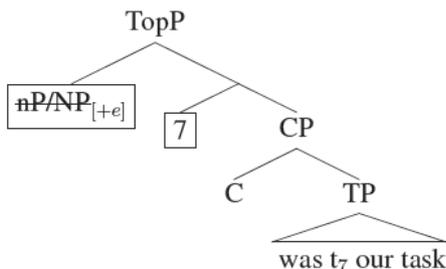
We argue that agreeing TO is an overt realization of a structure that arises via movement to TopP, as in (15). To be more precise, agreeing TO is a morphological exponent of the moved pronominal nP/NP<sup>11</sup> and a  $\lambda$ -abstraction structure created by movement, analogically to relative pronouns in relative clauses (Hulsey and Sauerland 2006; among others). The boxes in the structure in (16) indicate which part of the structure agreeing TO is the overt realization of. We follow the notation in Heim and Kratzer (1998); the number 7 corresponds to the index created by  $\lambda$ -abstraction triggered by movement of invariable TO, i.e., the elided nP/NP<sub>[+e]}</sub> structure indicated by the higher box.

10  
 (i) Petr            se                    rozešel            s                    Marií,  
      Petr            refl                broke-up            with                Marie  
      ale            to                    se                    mi                    nelíbilo.  
      but            TO.N.SG            refl.cl            me.CL            not-liked  
      “Petr broke up with Marie but I didn’t like it.”

11 Prenominal nP/NP would have been realized as invariable TO, if it did not undergo movement to the left periphery.

(15)  $\text{to } \lambda x . x \text{ was our task}$

(16) The morphological mapping of agreeing *to*



We assume that for mapping to take place, there needs to be a trace-conversion-like mechanism in the structure (Fox 1999; 2003; Sauerland 2005; Elbourne 2005), followed by a variable insertion. The actual morphological realization is effectively a determiner replacement in the sense of the work cited above.

(17) Trace conversion mechanism

- (a) variable insertion:  $(\text{Det}) \text{ Pred} \rightarrow (\text{Det}) [\text{Pred } \lambda y (y=x)]$
- (b) determiner replacement:  $(\text{Det}) \text{ Pred} \rightarrow \text{the} [\text{Pred } \lambda y (y=x)]$

The work on trace conversion argues that after movement takes place, a variable is inserted in the position of the trace. In the next step, the structure is enclosed by a determiner that introduces the obligatory definite interpretation. Our proposal is different in that we are not concerned with the trace in and of itself, but instead we concentrate on the morphological mapping of the variable structure created by movement. Thus, we combine the insight of work on the interpretation of traces with insight on the morpho-syntactic nature of relativizers in relative clauses.

Notice that adopting the trace-conversion mechanism in and of itself does not explain the agreement properties of the moved pronoun. Even though the determiner replacement provides the relevant semantic interpretation, it does not create a D node in the sense of a  $\phi$ -feature bundle. Consequently, since there is no D in the structure, there is no direct source of valuable  $\phi$ -features. We argue that the only possible input for agreement mapping is the variable induced by movement.

This, of course, raises a non-trivial question of whether a variable can be morphologically realized. We argue that variables may indeed be overtly morphologically realized in a way parallel to  $\phi$ -feature Agree, but it may be done only by  $\phi$ -features that are semantically modeled as variables, i.e., features with a representation accessible to the interpretive component.

Recall that the empirical question we investigate is why agreeing TO may agree with its linguistic antecedent in masculine and feminine but not in neuter. While such a distinction is unexpected under a standard theory of  $\phi$ -feature Agree, modeling the pronoun as an overt realization of a variable structure opens the possibility of finding a difference in the featural representation of gender features that might be relevant for the semantic component. In other words, we need to ask whether there is any interesting difference between masculine and feminine vs. neuter that might be relevant for the pattern we investigate.

The most straightforward solution would be to posit that neuter is  $[-\text{GENDER}]$  and  $[-\text{GENDER}]$  cannot be probed by a head that searches for  $\phi$ -features. The obvious problem is that if TO appears in an argumental position then there is no problem with TO agreeing with  $\phi$ -features of its antecedent, so this cannot be correct. Furthermore, we cannot attribute argumental agreement to something like  $[\text{+PERSON}]$ , because as we have seen in (10a–b), neuter argumental TO may refer to objects as well. Instead, we propose that the relevant distinction needs to take into account both  $[\text{GENDER}]$  and  $[\text{PERSON}]$ . The feature geometry we assume for Czech is given in (18).

(18) Proposed feature geometry

- (a) F:  $+\text{GENDER}$  ( $? \pm\text{PERSON}$ )<sup>12</sup>
- (b) N:  $-\text{PERSON}$
- (c) MI:  $-\text{PERSON}$ ,  $-\text{GENDER}$
- (d) MA:  $+\text{PERSON}$ ,  $-\text{GENDER}$

We argue that there is a fundamental difference between  $\text{PERSON}$  and  $\text{GENDER}$  which is relevant for the pronouns we investigate here. While,  $\text{GENDER}$  features are semantically interpreted as variables, i.e., their interpretation strictly depends on their semantic assignment (Heim 2008; Sudo 2012; among others),  $\text{PERSON}$  features are crucially different in that they are interpreted as an index, i.e., they do not correspond to a variable in the same sense as  $\text{GENDER}$  features do.

We argue that this interpretive distinction has a morpho-syntactic consequence. Since only a  $\text{GENDER}$  feature is a variable, only a  $[\pm\text{GENDER}]$  feature can morphologically realize a variable induced by movement. Consequently, masculine and feminine features are a possible morphological realization of a variable induced by movement. In contrast, neuter cannot morphologically realize a variable induced by movement because technically it is not a  $\text{GENDER}$  feature, but  $[-\text{PERSON}]$  feature. It follows that left-peripheral TO can agree with its linguistic antecedent in masculine and feminine but not

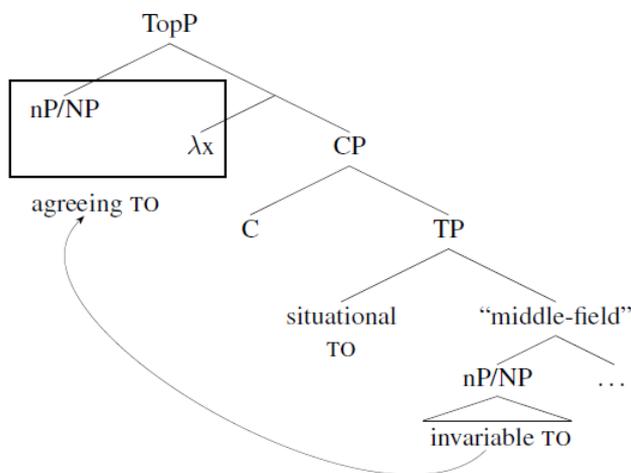
12 We are not aware of any data that would make it clear whether both  $[\pm\text{PERSON}]$  features are necessary for the representation of feminine, in parallel to the representation of masculine. It is possible that having  $[-\text{PERSON}]$  feature is sufficient. Crucially, either of these two representations makes the same prediction for the case in hand.

in neuter, as only masculine and feminine correspond to a feature representation that may morphologically realize a variable.

#### 4. Conclusion

We have investigated the syntactic distribution of the Czech pronoun *to* which as we argued corresponds to three distinct syntactic structures. The distinctions are schematized in (19). While we assume that *to* referring to a situation is located in the TP domain, invariable *to* and agreeing *to* are related by movement. While invariable *to* is an overt realization of nP/NP elided in the middle-field, agreeing *to* is a result of overt morphological mapping of such a deleted nominal structure and a variable structure induced by movement to the left periphery.

(19) *Structural representation of the three distinct to*



The proposal has two major theoretical consequences. First, we argue that pronouns can be of varied semantic types, and the semantic distinctions correlate with distinct syntactic structures. This conclusion goes against the idea put forward by Postal (1969) and Elbourne (2005), namely, that pronouns are uniformly based on elided DPs. We provided empirical evidence that only a subset of pronouns may be derived in this way. Crucially, some pronouns are based on definite nP/NPs. Consequently, there is more than one derivational strategy to derive demonstrative pronouns, even within one language. Second, we have seen that referential and predicative definites/pronouns are at least in some instances related by movement, which opens the possibility of compositional treatment of at least some cases of type shifting in the nominal domain.

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# Feature Resolution and Agreement with Coordinated Subjects in Polish

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**Abstract:** The aim of this paper is to present the patterns of subject-verb agreement that arise in the context of coordination in Polish and to analyze them within the Agree framework of Chomsky (2001). The paper focuses on the phenomenon of Single Conjunct Agreement with both pre-verbal and post-verbal subjects and provides an account for the generalization that such an agreement pattern arises mainly with mass and abstract nouns. The realization of agreement on the verb depends on the interaction of features within the conjuncts and computation of these features on the coordination head. Most instances of singular verbal agreement with coordinated subjects result from agreement with the coordination phrase as a whole, and the only instance of true Single Conjunct Agreement arises in the context of abstract nouns, resulting from post-syntactic agreement with the closest conjunct.

**Keywords:** agreement; Single Conjunct Agreement; Polish; coordination.

## 1. The Phenomenon

Languages that exhibit the phenomenon of agreement between subjects and verbs have different strategies available for computing agreement in cases when the subject is a coordinated phrase. They can agree with the conjunction phrase as a whole (full agreement), with only one of the conjuncts (conjunct-sensitive agreement), or they can choose not to agree at all and opt for default agreement. If a language chooses the full agreement option, any feature mismatch between the conjuncts is resolved according to resolution rules (Corbett 1991; 2000). The partial agreement option entails agreeing with the closest available conjunct, whether structurally (the highest) or linearly (the closest). These choices, however, are dependent on a variety of syntactic and semantic

properties such as word order or the feature composition of the conjoined nominals. However, the most widespread syntactic correlation in partial agreement patterns is that subjects in VS word orders tend to agree with the First Conjunct, while subjects in SV word orders tend to agree with the Last Conjunct (Munn 1999; Aoun et al. 1994 and 1999 for Arabic; Benmamoun et al. 2010 for Hindi; Babyonyshev 1996 for Russian; van Koppen 2007 for Dutch; Kiss 2012 for Hungarian).

## 2. Conjunct-Sensitive Agreement in Polish

### 2.1 Overview of Gender and Number Agreement in Polish

Polish nouns can be divided into five agreement classes according to their grammatical gender (Laskowski 1988):

- (1) Polish gender agreement system:
  - (a) M1—masculine personal—e.g., *mężczyzna* (man), *aktor* (actor)
  - (b) M2—masculine animate—e.g., *pies* (dog), *byk* (bull)<sup>1</sup>
  - (c) M3—masculine inanimate—e.g., *stół* (table), *zegar* (clock)
  - (d) F—feminine—e.g., *kobieta* (woman), *lampa* (lamp)
  - (e) N—neuter—e.g., *dziecko* (baby) *krzesło* (chair)

Polish verbs show person and number agreement in the present and future tenses, as well as agreement for gender in the past tense. Past tense verbs (*l*-participles) distinguish three genders in the singular—masculine, feminine, and neuter, and two in the plural—masculine personal (M1) gender (traditionally known as “virile”) and otherwise (M2, M3, F, N) (“non-virile”). The appropriate verb endings are given in Table 1.

| Singular |        | Plural                              |        |
|----------|--------|-------------------------------------|--------|
| Gender   | Ending | Gender                              | Ending |
| M1       | -∅     | M1 (Virile)                         | -i     |
| M2       |        | Otherwise<br>(Non-Virile<br>(nvir)) | -y     |
| M3       |        |                                     |        |
| F        | -a     |                                     |        |
| N        | -o     |                                     |        |

**Table 1.** Polish past tense agreement (*l*-participles).

<sup>1</sup> There are, however, some inanimate nouns in this class, such as *papieros* “cigarette” or *komputer* “computer.”

In the context of coordinated animate subjects, Polish resorts to feature resolution whenever the verb shows full agreement, i.e., agreement with the coordinated phrase as a whole. Person features are resolved according to person hierarchy (1st person > 2nd person > 3rd person; cf. Corbett 1991). If one of the conjuncts has features which are higher in the hierarchy, they determine the whole feature specification of the coordinated phrase. Whenever conjuncts of different genders are conjoined, gender resolution rules are applied (Corbett 1991, 284–86). The most general resolution rule states that if the subject includes a masculine personal conjunct, the predicate will be in the virile form (2); otherwise the verb will be in the non-virile form (3):

(2) Brat i siostra weszli do Pokoju.  
 brother.M1 and sister.F went.VIR.PL in room  
 “A brother and a sister went into the room.”

(3) Siostry i matka weszły do Pokoju.  
 sisters.F and mother.F went.NVIR.PL in room  
 “The sisters and their mother went into the room.”

However, there are also exceptions to this general rule. If the subject includes the masculine and personal features, whether these are syntactic or semantic, the predicate may be in the virile form (4). If the subject includes a masculine animate conjunct, the predicate may be in the masculine personal form (5). Otherwise the predicate will be in the non-masculine personal form (6) (examples [4]–[6]: Corbett 1991, 285–86).<sup>2</sup>

(4) Mama, córeczka i wózek ukazali/ukazały się nagle.  
 mother.F daughter.F and pram.M3 showed.VIR/NVIR.PL refl suddenly  
 “A mother, a daughter and a pram suddenly appeared.”

(5) Pies i kot jedli/jadły na podwórzu.  
 dog.M2 and cat.M2 ate.VIR/NVIR.PL on yard  
 “The dog and the cat were eating in the yard.”

2 As an anonymous reviewer pointed out, the possibility of the masculine human agreement form in examples (4) and (5) questions the validity of postulating the category “virile.” Indeed, as Willim (2006, 106) points out, virile (or masculine human) might not form a gender in its own right, but might be “a label over a semantically defined class, which belongs with the so-called masculine animate gender category.” However, as a result of space constraints, I will continue to use the traditional “virile” vs “non-virile” distinction in marking the plural agreement forms, while bearing in mind that they are not entirely accurate.

- (6) Siostry i matka czytały.  
 sisters.F and mother.F read.NVIR.PL  
 “The sisters and their mother were reading.”

## 2.2 Post-verbal Context

Agreement with coordinated subjects appearing post-verbally follows two main patterns. The verb can either show full agreement with the coordination phrase as a whole, or it can agree with the first conjunct only. This is possible for all types of verbs and singular [7], plural [8], concrete countable [9], and mass nouns [10], as well as abstract nouns [11].

- (7) Do pokoju weszli/wszedł chłopiec i dziewczynka.  
 in room came.V.PL/.M.SG boy.M1 and girl.F  
 “Into the room came a girl and a boy.”
- (8) Turniej zdominowały/li tenisistki i tenisisci.  
 tournament dominated-NVI.PL/VIR.PL tennis-players.F and  
 tennis-players.M1  
 “Female and male tennis players dominated the tournament.”
- (9) W pokoju stało/stały krzesło i stół.  
 in room stood-N.SG/NVIR.PL chair.N and table.M3  
 “A chair and a table stood in the room.”
- (10) Z ulicy dobiegał/dobiegały śpiew i muzyka.  
 from street run.M.SG/NVIR.PL singing.M3.SG and music.F  
 “Singing and music came from the street.”
- (11) Na ulicy panował/panowały strach i panika.  
 on street ruled.M/SG/NVIR.PL fear.M3 and panic.F  
 “Fear and panic ruled the street.”

However, the resolved agreement pattern becomes unavailable whenever one of the conjuncts includes a “5 & up” numeral. In such cases, only agreement with the closest conjunct is possible (12):

- (12) Do pokoju weszła/\*weszli dziewczynka i pięciu chłopców.  
 in room came.F.SG/\*VIR.PL girl.F and five boys.M1  
 “A girl and five boys came into the room.”

## 2.3 Pre-verbal Context

In a context where the subject appears in its canonical pre-verbal position, the pattern becomes more complicated. Whenever two personal (13) or concrete countable (14) nouns are conjoined, the verb must appear in the plural resolved form, and singular agreement with either of the conjuncts becomes ungrammatical:

- (13) Dziewczynka i chłopiec weszli/\*weszła/\*wszedł do pokoju.  
 girl.F and boy.M1 came.VIR.PL/\*F.SG/\*M.SG in room  
 “A girl and a boy came into the room.”

- (14) Krzesło i stół stały/\*stał/\*stało w pokoju.  
 chair<sub>N.SG</sub> and table<sub>M3.SG</sub> stood.NVIR.PL/\*M.SG/\*N in room  
 “A chair and a table stood in the room.”

If mass nouns are conjoined, however, singular agreement becomes possible when both conjuncts are of the same gender (15) or the verb does not show gender agreement (16):

- (15) Kurz i pył podniósł/podniosły się z nawierzchni.  
 dirt<sub>M3</sub> and dust<sub>M3</sub> rose.M.SG/NVIR.PL self from surface  
 “Dust and dirt rose from the surface.” (Zbróg 2012, 100)

- (16) Śpiew i muzyka rozwesela/\*rozweselała serca.  
 singing.M3.SG and music.F amuses.SG/\*amused.F.SG hearts  
 “Singing and music amuses the heart.” [NKJP: *Dziennik Polski*]

The most varied pattern can be seen in the case of coordinated abstract nouns. They allow for both resolved plural agreement and singular agreement with the closest conjunct, with nouns of either the same (17) or of different genders (18), (19).

- (17) Miłość i prawda zwycięża/zwyciężyła/zwyciężyły.  
 love.F.SG and truth.F wins.SG/won.F.SG/NVIR.PL  
 “Love and truth will win / won.”

- (18) Ciekawość i zniecierpliwienie rośnie/rosło/rosły.  
 curiosity.F and impatience.N grew.N.SG-VIR.PL  
 “Curoosity and impatience are/were growing.”

- (19) Jej głos i zachowanie jest/było/były odpychające.  
 her voice.M3 and behavior.N is<sub>SG</sub>/was.N.SG/VIR.PL repulsive  
 “Her voice and behavior are/were repulsive.” [NKJP: *Przekraczając światło*]

Last Conjunct Agreement pattern is also available with coordinated phrases containing “5 & up” numerals, even if the nouns are personal (20):

- (20) Pięciu mężczyzn i kobieta weszła do pokoju.  
 five men.M1 and woman.F. came<sub>F.SG</sub> in room  
 “Two women and five men came into the room.”

## 2.4 Summary of the Data

The following pattern emerges from the data presented in Sections 2.1–2.3: full agreement (agreement with &P as a whole) is possible in both pre-verbal and post-verbal contexts and with all types of nouns. Singular (or partial) agreement, on the other hand, is available in the following instances: in post-verbal contexts with all types of nouns; in pre-verbal contexts: with mass nouns, provided that both conjuncts have the same gender or the verb does not show gender agreement (in the present tense), and with abstract nouns, with both the same and different genders and with verbs showing gender agreement. The results for the singular agreement pattern are given in Table 2:

|                | Present tense |                   | Past tense  |                   |
|----------------|---------------|-------------------|-------------|-------------------|
|                | same gender   | different genders | same gender | different genders |
| Personal nouns | impossible    | impossible        | impossible  | impossible        |
| Mass nouns     | possible      | possible          | possible    | impossible        |
| Abstract nouns | possible      | possible          | possible    | possible          |

**Table 2.** Singular agreement in pre-verbal contexts.

## 3. Previous Analyses

First Conjunct Agreement with post-verbal subjects in Polish is analyzed in Citko (2004). She proposes two different structural configurations for possible agreement patterns in post-verbal contexts. The first structure is a Bare &P structure headed by coordination [<sub>&P</sub> DP1 [<sub>&</sub> & DP2]], while the second is a Plural Pronoun &P structure, where the coordination phrase is embedded in an empty plural pronoun phrase [<sub>DP</sub> *pro*<sub>PL</sub> [<sub>D'</sub> [<sub>&P</sub> DP1 [<sub>&</sub> & DP2]]]. The first possibility gives rise to a singular First Conjunct Agreement pattern, while the second one results in plural resolved agreement on the verb. Citko's (2004) analysis predicts, however, that Last Conjunct Agreement (LCA) in Polish should not be possible, contrary to fact.

Conjunct-sensitive agreement patterns for Serbo-Croatian and Russian are analyzed in Bošković (2009; 2010). He proposes a mechanism for deriving First

and Last Conjunct Agreement based on Chomsky's (2001) Agree and a number of additional assumptions. Following Pesetsky and Torrego (2007), he assumes that uninterpretable features can be both valued and unvalued, and that unvalued features must be deleted before they enter semantics. Grammatical gender in Serbo-Croatian and Russian is assumed to be an uninterpretable feature, while semantic gender (present on personal nouns) is an interpretable feature. Furthermore, he follows the Matching/Valuation distinction and argues that in some cases Matching can fail to result in Valuation. Crucially, he assumes that uninterpretable features can be deleted either after Valuation or at the point of Spell-Out, if they never undergo Matching in the first place and simply enter the derivation as valued. What is more, he relies on the possibility of T probing for features more than once, resulting in a Primary and Secondary Agree operation (Béjar 2003; Rezac 2004). Under these assumptions it is possible for him to subsume both First Conjunct Agreement [FCA] and Last Conjunct Agreement [LCA] phenomena under the mechanism of Agree.

In Serbo-Croatian, the &P does not compute the gender feature, while in Russian it can also be optionally specified for number. The FCA agreement pattern in Serbo-Croatian is derived via Agree, where the Part Probe targets (21a) both the &P, valuing number and person, and the first conjunct, valuing gender (21b).

- (21) a) Part [n: g:]                      [<sub>&P</sub>[n:PL] NP1 [n:PL g:VAL1] [<sub>&</sub> & NP2[n: VAL g: VAL2] ]]
- 
- b) Part [n: PL g: VAL1] [<sub>&P</sub>[n:PL] NP1 [n:PL g:VAL1] [<sub>&</sub> & NP2[n: PL g: VAL2] ]]

Crucially, FCA is not available in coordination contexts where the first conjunct is singular, as it would result in conflicting features with &P, which is always plural.

LCA, on the other hand, relies on a Primary and Secondary Agree mechanism. The participial probe initiates Agree with both &P and the first conjunct. In cases involving movement, however, this operation results in Matching, but, crucially, not valuation. According to Bošković (2009; 2010), first conjuncts in Serbo-Croatian are available for extraction, and that makes them viable for pied-piping. He also assumes that valutors determine pied-piping. This results in a “lethal ambiguity” (McGinnis 1998) situation, where the Part Probe targets both the &P as a whole and the first conjunct, and both of them are available for pied-piping. Following Béjar (2003), Bošković assumes that a failure in pied-piping leads to a failure in valuation. The first Agree operation fails (no valuation of either number or gender on the Part Probe) However, the gender feature on the first conjunct, being uninterpretable and valued, is deleted. The Part Probe initiates Secondary Agree and values its gender feature on the next closest element—the second conjunct. This operation is successful, as the



sentences indicate that Single Conjunct Agreement with pre-verbal subjects is actually Last Conjunct Agreement, and not Second Conjunct Agreement.<sup>3</sup>

Aoun et al. (1994; 1999) focus on Single Conjunct Agreement in Arabic and analyze it in terms of clausal reduction. What appears to be agreement with a single conjunct of coordinated phrasal constituents is in fact agreement with a single, non-coordinated subject. Such sentences are analyzed as involving coordination of clauses with subsequent reduction (ellipsis) in the first clause.

This analysis predicts that Single Conjunct Agreement on the verb would be impossible with such modifiers as *together*, or with predicates such as *collide with each other*, which require plural subjects. As (24) and (25) show, both the modifier and the predicate can appear in sentences where one of the conjuncts is singular, which is impossible under clausal reduction analysis:

(24) Razem do pokoju Weszły dwie dziewczynki i chłopiec.  
 together in room came.NVIR.PL two girls<sub>F</sub> and boy.M1  
 “Two girls and a boy came into the room together.”

(25) Jeden rowerzysta i cztery rowerzystki  
 one cyclist.M1 and four cyclists<sub>F</sub>  
 zderzyły się ze sobą.  
 collided.NVIR.PL REFL with self  
 “One male and four female cyclists collided with each other.”

Marušič et al. (2012) analyze the different agreement patterns available in Slovenian. Coordinated phrases in Slovenian always trigger plural agreement, so Marušič et al. (2012) assume that &P always computes the number feature. If both conjuncts are singular, the output feature on &P is dual; if one of the conjuncts is [-singular] &P surfaces as plural; if, however, one or both of the conjuncts do not have any phi-features (as in the case of 5 & up numerals), the number feature is undefined. However, &P in Slovenian lacks the ability to compute the gender feature.

3 The unavailability of agreement with the closest possible noun phrase in (i) and the possibility of agreement with the last conjunct show that agreement is still sensitive to the internal structure of the conjunction phrase and targets the closest available conjunct, not the closest available noun.

(i) Zniecierpliwienie I Irytacja czekaniem na film  
 impatience.N and irritation<sub>F</sub> waiting for movie.M3  
 rosta/rosły/\*rósł z Minuty na minutę.  
 grew<sub>F</sub>.SG/NVIR.PL/M.SG from Minute to minute

They propose three strategies of computing agreement with the coordination phrase, which are dependent on the interplay of two competing principles—No-Peeking (where the grammar prefers not to look inside the &P and respects hierarchical structure) and No-Default (where the grammar prefers the option of looking beyond the maximal &P projection and agreeing with one of the conjuncts). The first option is for the Agree operation to target the &P on its own, resulting in default masculine agreement (as &P in Slovenian does not compute the gender feature). The second option is to agree with the hierarchically closest conjunct, resulting in Highest Conjunct Agreement in pre-verbal contexts. The last option is to agree with the linearly closest conjunct, resulting in Last Conjunct Agreement in pre-verbal contexts. The choice between the last two options depends on whether the actual copying of features from one of the conjuncts happens pre- or post-syntactically (cf. Bhatt and Walkow, forthcoming; Benmamoun et al. 2010).

#### 4. Theoretical Assumptions

In order to derive the existing agreement patterns in Polish, I propose that a coordination phrase can be specified for all  $\phi$ -features, including number and gender. However, this specification is optional, depending on the type of the nominals involved. Following Willim (2000; 2006) and Bošković (2009), I assume that the semantic gender on personal nouns is an interpretable feature, while the grammatical gender is uninterpretable. What is more, I assume (after Willim [2006]) that mass nouns have an underspecified number feature (NUMBER:  $\emptyset$ ), which is subject to a morphological realization rule that spells it out as singular. I propose two generalizations that account for the attested patterns of coordination agreement:

- (26) A coordination phrase can optionally be interpreted as plural if all the nouns within the phrase have an underspecified number feature. Otherwise plural interpretation is obligatory.
- (27) A coordination phrase can optionally be underspecified for gender if all the nouns within the phrase have an uninterpretable gender feature. Otherwise gender specification is obligatory.

The interplay of these two generalizations and different types of coordinated nouns will be explained in detail in Section 6. Subject-verb agreement is established via an Agree operation (Chomsky 2000; 2001), with the probe T valuing its features against a local goal. The operation proceeds in steps, where the probe first Matches the goal, while the valuing of the features can be postponed until after spell-out (after Marušič et al. 2012; cf. Benmamoun et al. 2010).

I assume a standard analysis of coordinated phrases, with the coordination (&) as the head of the phrase, taking the second conjunct as its complement, and with the first conjunct in the specifier position (cf. Johannessen 1998; Zhang 2010).

## 5. First Conjunct Agreement

Whenever a coordinated subject appears in the post-verbal position, the verb has an option of realizing either full agreement or Single Conjunct Agreement with the closest nominal phrase. This variability is due to the fact that the T probe has two potential equidistant goals—either the maximal projection or the first conjunct in the specifier position. Targeting the maximal projection results in full plural agreement, while targeting the specifier gives First Conjunct Agreement. This option is independent of the status of the nominals in question—personal, concrete, or abstract nouns can all trigger this type of agreement pattern.<sup>4</sup>

- (28) Do pokoju weszła/weszli Maria i Jan.  
 in room came<sub>F.SG/VIR.PL</sub> Mary<sub>F</sub> and John<sub>M1</sub>  
 “John and Mary came into the room.”

## 6. Last Conjunct Agreement

### 6.1 Personal and Concrete Countable Nouns

Personal and animate nouns have both interpretable gender and a specified number feature and so the conjunction of such nouns must always be specified both for gender and for plural number, following (26) and (27).

T targets the coordination phrase, which bears a full set of phi-features and it pied-pipes the whole &P subject to satisfy the EPP.

- (29) Chłopiec i dziewczynka weszli/\*weszła do pokoju.  
 boy<sub>M1</sub> and girl<sub>F</sub> came<sub>VIR.PL/\*F.SG</sub> in room  
 “A boy and a girl came into the room.”

What is more, (26) predicts that the presence of a personal noun will force the coordination phrase to compute plural number, even if one of the conjuncts is underspecified for number (e.g., a mass noun). This prediction is borne out:

- (30) Maria i tłum ludzi weszli/\*weszł do pokoju.  
 Maria<sub>F</sub> and crowd<sub>M</sub> people came<sub>VIR.PL/\*M.SG</sub> in room  
 “Mary and a crowd of people entered the room.”

<sup>4</sup> The choice of the agreement target seems to be due to speaker variation; however, both choices are made available by the grammar.

A similar situation arises in the context of inanimate, concrete, countable nouns. In contrast to personal nouns, they bear the uninterpretable gender feature; however, their number feature is still specified, and so it must always be computed on the coordination phrase (following [26]). Again, singular agreement is out of the question:

- (31) Stół i krzesło stały/\*stało/\*stał w pokoju.  
 table.M3 and chair<sub>N</sub> stood.NVIR.PL/\*N.SG/\*M.SG in room  
 ‘‘A table and a chair stood in the room.’’

## 6.2 Mass and Abstract Nouns

The agreement pattern diverges in the context of the coordination of two mass or abstract nouns. As they both have uninterpretable gender and can bear underspecified number features, both generalizations (26) and (27) come into play when agreement patterns in the coordination of these nouns are being determined. Mass nouns cannot appear in the plural, they cannot be modified by numerals, and they always trigger singular agreement on the verb. Following (26), the coordination of such nouns can optionally bear plural number, or it can project the underspecified number feature inherited from the conjuncts and trigger singular agreement. Similarly, most abstract nouns are uncountable and therefore bear underspecified number features as well. Furthermore, both of them contain nouns with uninterpretable (grammatical) gender and therefore the coordination of these nouns can optionally be specified for gender. They differ, however, in the implementation of the generalization in (27)—the coordination of mass nouns computes the gender feature, while the coordination of abstract nouns does not.

In the case of two coordinated mass nouns of the same gender &P can either bear the plural number and resolved gender, or it can project the underspecified number feature and the gender common to both conjuncts. The first instance results in plural agreement and the second one results in singular agreement:

- (32) Kurz i pył podniósł/podniosły się z nawierzchni.  
 dirt.M3 and dust.M3 rose.M.SG/NVIR.PL refl from surface  
 ‘‘Dust and dirt rose from the surface’’ (Zbróg 2012, 100).

When the coordinated phrases have two different gender features, as in (33), and the T head does not probe for gender (as in the present tense), the grammar either interprets &P as plural, or inserts the default singular available for underspecified number,  $\emptyset$ :

- (33) Śpiew i muzyka rozwesela serca  
 singing.M3.SG and music<sub>F</sub> amuses.3.SG hearts  
 ‘‘Singing and music amuses the heart’’ [NKJP: *Dziennik Polski*]

However, if the T head probes for gender, the &P is obligatorily interpreted as plural to ensure resolution of the conflicting features computed on the coordination phrase. Only non-virile gender, available in the plural, can resolve masculine inanimate, feminine, and neuter genders (see Table 1). Singular agreement is, therefore, impossible in these cases, and the verb has to surface in the resolved plural form:

- (34) Trawa i zboże rosły/\*rosło na polu.  
 grass.F and wheat<sub>N</sub> grow.NVIR.PL/N.SG on field  
 “Grass and wheat grow in the field.”

Similarly to mass nouns, abstract nouns also fall under the “optionality” scenarios in (26) and (27). However, they do allow for true Last Conjunct Agreement, that is, singular agreement in the presence of two nominals with different genders. The derivation of examples with conjuncts of the same gender proceeds in the same fashion as for mass nouns. When conjuncts have different genders, however, the coordination phrase is specified for person, but underspecified for number and for gender. If T does not probe for gender features (e.g., present tense), it targets the coordination phrase as a whole. The 3rd person feature is valued and the underspecified number feature is spelled out as singular:

- (35) Miłość i szacunek zawsze zwycięża.  
 love<sub>F</sub> and respect<sub>M3</sub> always wins.3.SG  
 “Love and respect always win.”

However, if T does probe for gender, it targets the coordination phrase but it cannot value its gender features against it and the Agree operation fails. Gender is then valued post-syntactically with the linearly closest conjunct (following Marušičet al. [2012]) and the LCA pattern arises, as in (36).<sup>5</sup>

- (36) Głód i nędza zmusiła ją do kradzieży.  
 hunger<sub>M3</sub> and poverty<sub>F</sub> forced<sub>F.SG</sub> her to theft  
 “Hunger and poverty forced her to steal.”

Interestingly, the generalization in (26) predicts that the coordination of an abstract and a concrete countable noun should trigger plural agreement only. This prediction is confirmed in (37). Even though both nouns have feminine gender, singular agreement is impossible in this case:

<sup>5</sup> In both examples (35) and (36) there is the option of plural resolved agreement, which is the result of &P choosing the option of being specified for gender. Conflicting gender features can only be resolved through inserting the plural (as in mass nouns).

- (37) Brawura i zepsuta kierownica przyczyniły/\*przyczyniła  
recklessness.F and faulty steering wheel.F contributed.NVIR.PL/F.SG  
sie do tego wypadku samochodowego.  
self to this accident car  
“Recklessness and a faulty steering wheel contributed to this car accident.”

### 6.3 Numeral Phrases

Last Conjoint Agreement is, however, possible not only with abstract nouns but also with coordinated phrases where one of the conjuncts is a “5 & up” numeral. These numerals can be considered defective goals, as they trigger the default 3rd person singular neuter agreement when they appear on their own, instead of the predicted virile plural agreement:

- (38) Pięciu chłopców zjadło/\*zjedli śniadanie.  
five boys.M1 ate.N.SG/\*VIR.PL breakfast  
“Five boys ate breakfast.”

To account for their ability to appear in LCA constructions, I propose that a coordinated phrase containing a “5 & up” numeral phrase has an empty feature set, forcing the T probe to value its features post-syntactically against the closest conjunct:

- (39) Pięciu mężczyzn i dwie kobiety weszły do pokoju.  
five men.M1 and two women.F came.NVIR.PL in room  
“Five men and two women came into the room.”

If the linearly closest conjunct happens to be a “5 & up” numeral itself, the grammar is forced to resort to the default agreement, and the 3rd person singular neuter agreement appears:

- (40) Dwie kobiety i pięciu mężczyzn weszło do pokoju.  
two women.F and five men.M1 came.N.SG in room  
“Two women and five men came into the room.”

The absence of features on the coordinated phrase in the presence of a “5 & up” numeral explains their behavior in post-verbal contexts as well. Whenever a “5 & up” numeral appears in the coordinated phrase, resolved plural agreement is impossible and the verb agrees with the first conjunct instead:

- (41) Do pokoju weszła/??weszli dziewczynka i pięciu chłopców.  
in room came.F.SG/??VIR.PL girl.F and five boys.M1  
“A girl and five boys came into the room.”

The &P, being featureless, is not a viable goal for T, and the Probe targets the specifier instead. As in LCA, if this conjunct happens to be a “5 & up” numeral, it triggers the default agreement:

- (42) Do pokoju weszło/\*weszli pięciu chłopców i dziewczynka.  
 in room came.N.SG/\*VIR.PL five boys.M1 and girl<sub>F</sub>  
 “Five boys and a girl came into the room.”

## 7. Conclusions

In this paper, I have presented an account of Polish subject-verb agreement patterns arising in the context of coordination. Both singular and plural agreement are possible with subjects in pre-verbal and post-verbal positions and the choice of the verb depends on the feature composition of the conjuncts involved. In the post-verbal context, FCA is made possible by the equidistance of both the &P and the first conjunct, while in pre-verbal subjects, what on the surface seems to be agreement with the single mass or abstract conjunct is in fact agreement with the coordination phrase as a whole, which bears the features of both conjuncts. The difference in the availability of singular agreement with personal or countable and mass or abstract nouns relies on the interpretability of their gender and the availability of an underspecified number feature. Only abstract nouns exhibit true Last Conjunct Agreement, as they optionally allow for both their gender and their number to be (under)specified on the coordination phrase.

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# Characterizing and Defining Predicational Clauses in Polish

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**Abstract:** The paper aims to show that it is necessary to split Polish predicational clauses into two distinct subclasses—characterizing and defining. The split was first proposed by Roy (2006; 2013) for French, Russian, Irish, and Spanish. It is first shown that Polish has three distinct structural types of predicational clauses, namely Type 1, featuring the verbal copula *być* “to be,” followed by the predicate in the instrumental, Type 2, in which *być* is followed by the nominative case marked predicate, and Type 3, which hosts the pronominal copula *to* with or without *być*. It is argued that Types 2 and 3 pattern together as regards the tests proposed by Roy (2006; 2013), and can thus be taken to represent a defining class. Type 1 sentences show properties distinct from Types 2 and 3, and can therefore be classified as a characterizing class.

**Keywords:** copula; predicational clauses; Polish; characterizing clauses; defining clauses.

## 1. Introduction

The aim of the paper is to show that Polish has three distinct types of predicational clauses, which share a number of properties, but also differ in some systematic ways, which makes it possible to posit a new distinction within the Polish predicational class. The distinction in question has first been put forward for French, Irish, Spanish, and Russian by Roy (2006; 2013), and consists in distinguishing two subtypes of predicational clauses, namely characterizing and defining.

The paper consists of five sections. Section 2 introduces the three types of predicational clauses to be examined in the paper. Section 3 presents Roy’s (2006; 2013) arguments in favor of splitting the predicational clauses in French into characterizing and defining. Section 4 demonstrates how the tests postulated by Roy (2006; 2013) can be applied to Polish data. Section 5 concludes the paper.

## 2. Three Types of Predicational Clauses in Polish and Their Basic Characteristics

Higgins (1979) postulates a typology of copular clauses in English and distinguishes four classes, namely predicational, specificational, equative (identity), and identificational copular clauses. Since this paper analyzes only predicational clauses, attention is limited to just this class and not the remaining three classes of copular clauses, unless necessary (for a detailed description of all four types of copular clauses in English see, for instance, Mikkelsen [2005]; a complete typology of Polish copular clauses can be found in Bondaruk [2012; 2013]). Higgins (1979) specifies that predicational sentences ascribe a property to a subject. In English there is only one type of predicational clause, containing the copula verb *to be*; as illustrated in (1) below, the property of being *a skillful worker* is predicated of the subject *Jack*:<sup>1</sup>

- (1) Jack is a skillful worker.

In Polish, Citko (2008) distinguishes two types of copula, namely the verbal one, *być* “to be,” and the pronominal one, *to*.<sup>2</sup> The verbal copula can be found in two types of predicational clauses, differing just in the case marking of the post-verbal predicate. Most commonly, the predicate is marked for the instrumental, as in Type 1 clauses, such as (2) below, but it can sometimes surface in the nominative, as in Type 2 clauses, such as (3) below:

- (2) Marek        jest    szefem.<sup>3</sup>    *być* + DP<sub>INSTR</sub>    Type 1  
 Mark-NOM    is       boss-INSTR  
 “Mark is a boss.”

- (3) Marek        jest    szef.        *być* + DP<sub>NOM</sub>    Type 2  
 Mark-NOM    is       boss-NOM  
 “Mark is a boss.”

1 Besides predicational clauses with nominal predicates English also has predicational sentences with AP and PP predicates as in (i) and (ii) below:

- (i) Jack is skilful.  
 (ii) Jack is at home.

This paper focuses entirely on predicational clauses with nominal predicates of the <e, t> type, i.e., those that denote properties (cf. Partee 1987; Mikkelsen 2005).

2 Although the pronominal copula *to* is homophonous with the demonstrative pronoun *to* meaning “this,” we will gloss it as “COP” throughout the paper to keep the two items distinct from each other. The pronominal copula *to* can regularly co-occur with the verbal copula *być* “to be,” as can be seen, for instance in (5), which gives rise to what Citko (2008) calls the dual copula clauses.

3 The following abbreviations are used in this paper: ACC—accusative, COP—copula, IMPERF—imperfective, INSTR—instrumental, NOM—nominative, PERF—perfective, REFL—reflexive.

Both (2) and (3) ascribe the property of *being a boss* to *Mark* and therefore they can be labeled as predicational in Higgins' (1979) model. Whereas Type 1 sentences such as (2) have been extensively analyzed in the literature (cf. Rothstein 1986; Bailyn and Citko 1999; Citko 2008; Bondaruk 2013, inter alia), those belonging to Type 2 have been treated as marginal and hence have been largely ignored (with the exception of Przepiórkowski's [2001] analysis). Although Type 2 sentences are not as frequent as Type 1 clauses, they can be attested in the National Corpus of the Polish Language (cf. Przepiórkowski et al. 2012) and are thoroughly described by traditional grammarians, such as Klemensiewicz (1926), among others. In fact, Klemensiewicz (1926) compares *być* + DP<sub>NOM</sub> with *być* + DP<sub>INSTR</sub> sentences and observes that whereas in the former the predicate defines the subject, in the latter it just describes the subject. Following Małecki (1879), Klemensiewicz (1926) observes that the nominative predicate expresses those properties of the subject that are stable and which relate to its very nature. The instrumental one, on the other hand, is associated with properties that are subjective, less essential and more temporary. To prove this point, he provides the following example:

- (4) Piotr            jest    stolarz,            ale    u    mnie    przez  
 Peter-NOM    is    carpenter-NOM    but    at    me    for  
 ten    rok    cały    musi    być    kołodziejem.  
 this    year    all    must    be    cartwright-INSTR  
 "Peter is a carpenter but at my place he must be a cartwright this year."  
 (Klemensiewicz 1926, 127)

In (4) the nominative predicate *stolarz* "carpenter" is used to indicate Peter's usual profession, whereas his temporary occupation is expressed by means of the instrumental predicate, *kołodziejem* "cartwright." The observations just made concerning the differences in meaning between Type 1 and Type 2 predicational clauses will turn out to be relevant in Section 4, where an attempt is made to account for these differences in a systematic way.

As for the pronominal copula *to*, it can be found in predicational clauses of Type 3 in Polish, exemplified in (5) below:

- (5) Marek        to        (jest)    szef.        *to być* + DP<sub>NOM</sub>    Type 3  
 Mark-NOM    COP    is        boss-NOM  
 "Mark is a boss."

Sentence (5), in a way analogous to (2) and (3), ascribes the property of *being a boss* to *Mark*, and hence can be classed as predicational. The predicate used in this type of clause is always marked for the nominative. Moreover, it is worth mentioning that (5)



- (8) (Jeśli idzie o Marka), on jest szefem. Type 1  
 as goes about Mark he is boss-INSTR  
 “As for Mark, he is a boss.”
- (9) (Jeśli idzie o Marka), on jest szef. Type 2  
 as goes about Mark he is boss-NOM  
 “As for Mark, he is a boss.”
- (10) (Jeśli idzie o Marka), on to (jest) szef. Type 3  
 as goes about Mark he COP is boss-NOM  
 “As for Mark, he is a boss.”

In sentences (8)–(10), the personal pronoun *on* “he” is used in place of the dislocated subject *Marek* “Mark,” which indicates that all these sentence types are predicational in nature.

Secondly, Partee (1998, 119; 2010), Mikkelsen (2005, 109), and Geist (2007, 82) note that only predicational clauses can serve as complements of the verb *consider*. The Polish equivalent of the English verb *consider*, i.e., *uważać*, differs from its English counterpart in that it selects just a small clause complement, and never takes an ECM complement.<sup>6</sup> Since the subject and the predicate of Type 1, Type 2, and Type 3 clauses (see [2], [3], and [5]) can be found in the small clause complement of the verb *uważać* “consider,” as confirmed by (11) below, we may draw the conclusion that Type 1, 2, and 3 sentences can be classed as predicational:

- (11) Uważam Marka za szefa.  
 I-consider Mark-ACC for boss-ACC  
 “I consider Mark to be a boss.”

- 
- (i) Mój najlepszy przyjaciel to (jest) Marek. specificational  
 my best friend-NOM COP is Mark-NOM  
 “My best friend is Mark.”
- (ii) Jeśli idzie o mojego najlepszego przyjaciela, to  
 if goes about my best friend this  
 to (jest) Marek. specificational  
 COP is Mark-NOM  
 “As for my best friend, this is Mark.”

Sentence (i) is an instance of a specificational clause in Polish. Sentence (ii) shows that when the subject of the specificational clause is dislocated, it is resumed by means of the pronoun with a non-personal reference. This makes specificational clauses distinct from the predicational ones (cf. [8]–[10] above).

6 Polish is a language that lacks ECM altogether.

The third test that is applicable to the three types of predicational clauses in Polish relates to copula verb deletion, which, as first observed by Higgins (1979) (see also Heller and Wolter 2008), is possible in predicational, but not in specificational clauses. The results of copula verb deletion in Type 1, 2, and 3 clauses are depicted in (12)–(13) below:

(12) Marek     jest     szefem     a     Marta     – dyrektorem     Type 1  
 Mark-NOM   is     boss-INSTR   and   Martha-NOM     director-INSTR  
 “Mark is a boss and Martha—a director.”

(13) Marek     jest     szef         a     Marta     – dyrektor.     Type 2  
 Mark-NOM   is     boss-NOM   and   Martha-NOM     director-NOM  
 “Mark is a boss and Martha—a director.”

(14) Marek     to     (jest)   szef         a     Marta     – dyrektor.     Type 3  
 Mark-NOM   COP   is     boss-NOM   and   Martha-NOM     director-NOM  
 “Mark is a boss and Martha—a director.”

In (12) and (13) it is the copula verb that has been omitted, while in (14) the pronominal copula *to* has been left out. Since all of these sentences are perfectly grammatical, the conclusion must be reached that all of them belong to the predicational class.

To sum up this part of the discussion, it must be emphasized that the classification of the three types of clauses under consideration as predicational is completely justified, as they pattern in an analogous way with respect to Left Dislocation, and copula omission. Their subjects and predicates can also serve as small-clause complements of the Polish equivalent of *consider*.

### 3. Roy’s (2006; 2013) Proposal

Roy (2006; 2013) suggests splitting the predicational class into three subclasses, which she calls characterizing, defining, and situation-descriptive. The third class that Roy postulates is relevant only for those copular clauses that contain AP, not DP predicates, and therefore it will not be dealt with here; instead we will focus exclusively on the two remaining classes, namely the characterizing and defining ones.

The starting point for Roy’s analysis corresponds to French sentences such as (15) and (16) below, reproduced after Roy (2006, 28), which differ only in the presence of an article in front of the predicate.

(15) Paul     est     un     acteur.  
 Paul     is     an     actor  
 “Paul is an actor.”

- (16) Paul est acteur.  
 Paul is actor  
 “Paul is an actor.”

Roy argues that both copular clauses, with or without an article in front of the predicate, are predicational in Higgins’ (1979) terms. However, the variant with the article can only appear in one predicative context, i.e. in a post-copular position, and is banned from the complement position of small clauses, as illustrated in (17), taken from Roy (2006, 40):

- (17) Je croyais Matisse violoniste /\*un violoniste.  
 I believed Matisse violinist /\*a violinist  
 “I believed Matisse was a violinist.”

In (17) only the bare nominal is allowed within the small clause complement of the verb *croire* “believe,” while the one with the article is banned in this context.

Roy (2006; 2013) points out some of the regular contrasts that the two structures mentioned above give rise to. Firstly, Roy specifies that only the variant without the article can be found with aspectually marked verbs, as confirmed by (18) below, taken from Roy (2006, 47):

- (18) Paul a été (\*un) prince pendant 5 minutes,  
 Paul had been (\*a) prince for 5 minutes  
 et il est redevenu (\*un) baron immédiatement après.  
 and he had become (\*a) baron immediately after  
 “Paul had been a prince for 5 minutes and he became a baron again immediately after.”

Additionally, Roy emphasizes that only copular clauses with an indefinite predicate can give rise to lifetime effects in the past tense, whereas effects of this type are missing in copular clauses with a bare nominal. This is confirmed by (19) and (20) below, where only the latter implies that Paul is no longer alive:

- (19) Paul était médecin /ivrogne.  
 Paul was doctor drunkard  
 “Paul was a doctor/a drunkard.”

- (20) Paul était un médecin /ivrogne. (Roy 2013, 39)  
 Paul was a doctor drunkard  
 “Paul was a doctor/a drunkard.”

Roy (2006; 2013) also observes that only bare nominals can be found with locative modifiers. Indefinite nominals are excluded in this kind of context, as can be seen in (21) and (22), taken from Roy (2006, 53):

(21) Paul est médecin à Paris.  
Paul is doctor in Paris  
“Paul is a doctor in Paris.”

(22) \*Paul est un médecin à Paris.  
Paul is a doctor in Paris  
“Paul is a doctor in Paris.”

Furthermore, temporal modifiers are only allowed in clauses with a bare nominal, not in those containing an indefinite predicate, as confirmed by (23) and (24), taken from Roy (2013, 40), below:

(23) Max est étudiant le jour, et gardien de sécurité la nuit.  
Max is student the day and guard of security the night  
“Max is a student by day, and a security guard by night.”

(24) Max est un étudiant (\*le jour), et un gardien  
Max is a student the day and a guard  
de sécurité (\*la nuit).  
of security the night  
“Max is a student by day, and a security guard by night.”

Moreover, Roy observes that bare predicates, in contradistinction to those preceded by an article, entail participation in an activity, which is confirmed by the following data, taken from Roy (2006, 31):

(25) #Paul est médecin mais il ne pratique plus.  
Paul is doctor but he not practices anymore  
“Paul is a doctor, but he does not practice anymore.”

(26) Paul est un médecin mais il ne pratique plus.  
Paul is a doctor but he not practices anymore  
“Paul is a doctor, but he does not practice anymore.”

Sentence (25) with a bare nominal is a contradiction, as the second conjunct negates the practice of the activity entailed by the first conjunct. However, sentence (26), with a nominal predicate preceded by the indefinite article, is not contradictory, as the second conjunct negates the activity not entailed by the first conjunct; the activity in this case is treated only as a “label,” i.e., one can be a doctor because s/he has studied medicine, but may not practice medicine.

On the basis of the tests provided above, Roy (2006; 2013) argues that a new distinction is required within the class of predicational clauses, i.e., between characterizing (the variant without the article), and defining (the variant with the article) clauses. She specifies that characterizing clauses ascribe a property to an individual, whereas defining clauses express “a property salient enough to ‘define’ an individual as a particular member of a class of individuals” (Roy 2013, 35).

Moreover, Roy (2013, 47) observes that the distinction between defining and characterizing predicates cannot be captured within the individual vs. stage level dichotomy (see Milsark 1974; Carlson 1977). She notes that a defining predicate refers to a defining property, i.e., the most salient or characteristic property of an individual, a notion that does not easily reduce to a permanent vs. transient contrast. Furthermore, defining predicates are often ungrammatical in various contexts which tolerate adjectival individual-level predicates. Likewise, characterizing predicates differ from stage level predicates in that they do not behave in a homogenous way with respect to classic stage level tests which involve the use of temporal and locative modifiers. Bare nouns sometimes pattern with stage level predicates and sometimes with individual level predicates, which makes it impossible to treat characterizing predicates as members of either of the two classes. Consequently, Roy (2013, 66) concludes that neither the bare nominal nor the variant with the article have exactly the properties of stage and individual level predicates, respectively.

Extending her analysis to languages other than French, Roy (2006; 2013) observes that the distinction between characterizing and defining clauses is also present in Russian, Irish, and Spanish. As regards Russian, the language most closely related to Polish, she argues that copular clauses with nominative case-marked predicates are defining, whereas instrumental case-marked ones are characterizing. As we shall see in Section 4, Polish mimics Russian in this respect.

#### **4. Splitting Polish Predicational Clauses**

In order to distinguish defining from characterizing predicational clauses, Roy (2006; 2013) uses a number of syntactic tests, mentioned in Section 3. Let us take a look at each of these tests and try to apply them to the three types of predicational clauses in Polish. One of the tests Roy suggests relates to lifetime effects (cf. [19] and [20] above). She notes that only defining predicational clauses can convey lifetime effects in the past tense, in contradistinction to the characterizing ones. Out of the three types



predicational clauses, but it does not tolerate the nominative case-marked one, as in Type 2 (cf. [30] and [31]) and Type 3 predicational clauses (cf. [32]).

Yet another test proposed by Roy (2006; 2013) makes use of the small clause complements of lexical verbs (cf. [17]). Whereas characterizing predicates are allowed as small clause complements of this kind, defining ones are excluded in this context. Once again, this test shows that Type 2 and 3 clauses pattern together, in contradistinction to Type 1 clauses. Only  $DP_{\text{INSTR}}$  predicates are felicitous within small clause complements of verbs other than *być* ‘‘to be,’’ whereas  $DP_{\text{NOM}}$  predicates are never found in this kind of context, as can be seen in (33).

- (33) Stałeś się lekarzem /*\*lekarz.*  
 you-became REFL doctor-INSTR /*\* doctor-NOM*  
 ‘‘You became a doctor.’’

Moreover, following Roy’s (2006; 2013) argumentation provided for French (cf. [25] and [26]), we can also observe that, in Polish, a sentence such as (34) does not give rise to any contradiction, unlike the ones in (35) and (36), which are contradictory:

- Type 1  
 (34) Marek jest lekarzem, ale od dawna nikogo  
 Mark-NOM is doctor-INSTR but for long nobody  
 nie leczy.  
 not treats  
 ‘‘Mark is a doctor, but he hasn’t treated anyone for a long time.’’

- Type 2  
 (35) #Marek jest lekarz, ale od dawna nikogo  
 Mark-NOM is doctor-NOM but for long nobody  
 nie leczy.  
 not treats  
 ‘‘Mark is a doctor, but he hasn’t treated anyone for a long time.’’

- Type 3  
 (36) #Marek to jest lekarz, ale od dawna  
 Mark-NOM COP is doctor-NOM but for long  
 nikogo nie leczy.  
 nobody not treats  
 ‘‘Mark is a doctor, but he hasn’t treated anyone for a long time.’’

The contrast between (34) on the one hand and (35) and (36) on the other indicates that DP<sub>NOM</sub> must entail the actual practice of a given activity, unlike DP<sub>INSTR</sub>.

Furthermore, just like the French bare nominals analyzed by Roy (2006) (cf. [21] and [22]), Polish predicate nominals marked for the instrumental can be restricted by spatial modifiers. Compare the following:

Type 1 & 2

- (37) Marek        był        profesorem        /\*profesor        w        Lublinie.  
 Mark-NOM    was        professor-INSTR    /\*professor-NOM    in        Lublin  
 “Mark has been a professor in Lublin.”

Type 3

- (38) \*Marek        to        był        profesor        w        Lublinie.  
 Mark-NOM    COP    was        professor-NOM    in        Lublin  
 “Mark has been a professor in Lublin.”

Sentences (37) and (38) clearly show that the nominative predicate is disallowed in Polish whenever a spacial restriction is involved.

Likewise, only predicational clauses with instrumental case marked predicates tolerate temporal modifiers, while no modification of this type is allowed in predicational clauses with nominative predicates (cf. Roy’s examples [23] and [24] above). The contrast is illustrated in (39) and (40) below:

Type 1 & 2

- (39) Marek        był        profesorem        /\*profesor        przez    trzy    lata.  
 Mark-NOM    was        professor-INSTR    /\*professor-NOM    for        three    years  
 “Mark has been a professor for three years.”

Type 3

- (40) \*Marek        to        był        profesor        przez    trzy    lata.  
 Mark-NOM    COP    was        professor-NOM    for        three    years  
 “Mark has been a professor for three years.”

The data in (39) and (40) demonstrate that temporal modification, similarly to spacial modification, is felicitous in Type 1 clauses, but is banned in Type 2 and 3 sentences.

It is worth noting that nominals which are inherently stage level, such as *autostopowicz* “hitchhiker” in (41) and (42) below, are banned from occurring in Type 2 and Type 3 clauses.<sup>7</sup>

(41) Marek            jest    autostopowiczem    /#autostopowicz.    Type 1 & 2  
 Mark-NOM    is    hitchhiker-INSTR    /#hitchhiker-NOM  
 “Mark is a hitchhiker.”

(42) #Marek        to        jest    autostopowicz.                    Type 3  
 Mark-NOM    COP    is    hitchhiker-NOM  
 “Mark is a hitchhiker.”

Other nouns similar to the one used in (41) and (42) include *przechodzień* “pedestrian,” *więzień* “prisoner,” *zbieg* “fugitive,” *lokator* “tenant,” etc. However, as has been noted in Section 3, the stage/individual level distinction is insufficient (contra Citko 2008), as it cannot capture the contrast illustrated in (43) and (44) below, taken from Citko (2008, 274):

(43) #Marek        to        jest    zbieg.                                    Type 3  
 Mark-NOM    COP    is    fugitive-NOM  
 “Mark is a fugitive.”

(44) Marek        to        jest    wieczny    zbieg.                                    Type 3  
 Mark-NOM    COP    is    permanent    fugitive-NOM  
 “Mark is a permanent fugitive.”

Sentences (43) and (44) do not differ in the nominal predicate they contain, as they both have the predicate *zbieg* “fugitive.” What makes them different, however, is the fact that the predicate in the former bears no modification, while in the latter it is modified by an adjective. Consequently, the individual level interpretation in (44) does not depend on the predicate used, but rather on the modifier inserted in front of the predicate. For this reason we must conclude that the stage/individual level distinction cannot be linked in any way to the category of the predicate, and thus cannot account for the difference in acceptability between (43) and (44). Likewise, the distinction between stage and individual level predicates cannot capture the differences between Type 1, Type 2, and Type 3 sentences, as very often these three structures can be found with exactly the

<sup>7</sup> Citko (2008, 274) notes that “the pronominal copula is infelicitous with predicates which are inherently viewed as stage level, such as *fugitive*, *passenger*, *pedestrian* or *spectator*,” but can be used with individual level predicates.

same DP predicates (cf., for instance, examples [2], [3], and [5]), which differ only in their case form. Since Roy's (2006; 2013) distinction between defining vs. characterizing nominal predicates has a wider scope than the one based on the individual vs. stage level distinction, it can account for the interpretational differences between the three types of predicational clauses in Polish, and is therefore taken to be valid for this language.

Roy (2006; 2013) argues that the distinction between characterizing and defining predicates is reflected in their syntactic category, the former representing a classifier phrase and the latter a number phrase. Veselovská (2008), who analyzes Czech copular clauses with the copula *byť* followed by the predicate in the nominative or instrumental, notes that they show distinct characteristics of the nominal predicate on account of the fact that the copula occupies a distinct structural position in these two types of clauses. I do not advocate either of the two stances presented above. In contradistinction to Veselovská (2008), I suggest that there is only one verbal copula in Polish, which acts as a special kind of unaccusative verb, is located in little *v*, and takes a PredP as its complement, not a VP, as is typical of unaccusative verbs proper.<sup>8</sup> A similar structural position for the English copula can be found in Mikkelsen (2005). I would like to claim, contra Roy (2006; 2013), that the differences between the two classes of predicates found in characterizing and defining clauses are semantic in nature and therefore do not call for a different category in the syntax, although they may have some syntactic reflexes, as has been shown in the syntactic tests utilised in this section.

To sum up, it has been argued that Roy's (2006; 2013) splitting of the predicational class into two subclasses, i.e., defining and characterizing, is fully justified for Polish. This demarcation separates Types 2 and 3 from Type 1. In other words, those predicational clauses that take a nominative predicate pattern together, in contradistinction to those that require an instrumental predicate. Based on the tests taken from Roy (2006; 2013), it has been demonstrated that Types 2 and 3 represent defining predicational clauses, whereas Type 1 clauses belong to the characterizing class. The former exhibit lifetime effects in the past, cannot serve as small clause complements of lexical verbs, cannot be used with the verb *być* "to be" marked for the imperfective or perfective

8 The claim that *być* is not in Pred is supported by the fact that there exist clauses in which the predicational relation is encoded without *być*, or in which *być* is disallowed, as can be seen in (i) and (ii), respectively:

- |      |                               |          |               |             |                     |
|------|-------------------------------|----------|---------------|-------------|---------------------|
| (i)  | Marek                         | moim     | przyjacielem! | Niepożliwe! |                     |
|      | Mark-NOM                      | my       | friend-INSTR  | impossible  |                     |
|      | "Mark my friend! Impossible!" |          |               |             |                     |
| (ii) | Wybrali                       | Marka    | na            | kierownika  | /*być kierownikiem. |
|      | they-chose                    | Mark-ACC | for           | manager-ACC | be manager-INSTR    |
|      | "They chose Mark as manager." |          |               |             |                     |

aspect, do entail the actual practice of a given activity, and cannot be spatially or temporally restricted. The latter, on the other hand, show the opposite behavior.

## 5. Conclusion

The paper has aimed at demonstrating that the three structural types of predicational clauses in Polish represent two distinct subclasses. It has been shown that Polish, similarly to French, Irish, Russian, and Spanish, makes a fine grained distinction within the predicational class between characterizing and defining clauses, the former of which correspond to Type 1 sentences, whereas the latter are represented by Type 2 and 3 sentences. It has been observed that the difference between characterizing and defining subclasses of predicational clauses cannot be derived from a stage vs. individual level distinction, and that it is manifested in a number of phenomena, including, among others, lifetime effects, aspectual distinctions, restrictions on space and time adverbials, and the small clause complements of lexical verbs. It has been argued that the differences between characterizing and defining predicational clauses, although reflected in the syntax, are basically semantic in nature and therefore do not call for a distinct structural position of the copula or a distinct syntactic category of the predicate.

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# On the (Lack of) Referentiality of Polish Relational Adjectives

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**Abstract:** The paper is concerned with the issue of the referentiality of relational adjectives in Polish, such as *prezydencki* “presidential,” *górnicy* “pertaining to miner(s),” or *rodzicielski* “parental.” Relational adjectives are cross-linguistically observed to be property-denoting and unable to act as antecedents for anaphoric expressions. However, the data presented in the paper indicate that some Polish relational adjectives, namely those occurring as thematic (argument-like) modifiers, may be available as antecedents for reflexive possessives and for personal pronouns. Thus, nouns underlying such relational adjectives are visible in their syntactic representations, as is predicted by, among others, Alexiadou and Stavrou (2011), Marchis (2010), and Fábregas (2007).

**Keywords:** relational adjectives; possessive adjectives; referentiality; anaphora.

## 1. Introduction

This paper poses the question whether relational adjectives in Polish can exhibit any degree of referentiality and are available as antecedents for personal pronouns, reflexive possessive pronouns and other anaphoric expressions.

Relational adjectives are derived in Polish by means a variety of suffixes (cf. Szymanek 2010, 79–85), such as *-ski/-cki* (*prezydencki* “presidential,” *pszczelarski* “pertaining to beekeeper(s),” *rodzicielski* “parental”), *-owy* (*wojskowy* “military”) or *-ny* (*roślinny* “pertaining to plants”). They can also be formed by means of paradigmatic derivation (conversion), as in the case of *górnicy* “pertaining to miners” and *robotniczy* “pertaining to workers.” Polish relational adjectives perform a number of semantic functions (as shown in Szymanek 2010, 85–97). They can occur in subject-type or object-type readings when they accompany deverbal nouns, e.g., *górnice protesty* (lit. miner.ADJ protest) “miners’ protests” and *szkolenie harcurskie* (lit. train-

ing scout.ADJ) “scouts’ training.” Alternatively, they can denote possession (*wojskowy ośrodek wczasowy* “military holiday resort”), a substance of which something is made (*stalowy nóż* “steel knife”) or an instrument employed in some action (*haft maszynowy* “machine embroidery”), as well as indicating other relationships between the head noun and the noun from which the relational adjective is derived.<sup>1</sup>

Referentiality, i.e., the ability to refer to a specific entity, is regarded as a property of nouns (cf. Baker 2003), while adjectives are expected to denote properties of entities. Thus, the ability of relational adjectives to bind reflexive pronouns or act as textual antecedents for personal pronouns could be interpreted as a signal of the “nouniness” of such adjectives. It could also provide arguments supporting the analyses of denominal adjectives in Spanish, Greek, and Romanian, proposed within the framework of Distributed Morphology by Fábregas (2007), Alexiadou and Stavrou (2011), and Marchis (2010), in which nouns underlying relational adjectives are active in the syntactic derivation of such adjectives.

The paper is organized as follows. Section 2 illustrates the contrast between individual denotation and property denotation for *de*-phrases in French, as well as for genitive noun phrases in Russian. Section 3 mentions diagnostic tests that can be employed in distinguishing between referential (individual-denoting) and non-referential (property-denoting or classifying) readings of genitive phrases in Polish. In Section 4 the notion of anaphoric islands is introduced. It is employed to account for the lack of referentiality of Polish relational adjectives in many contexts. Then, however, Section 5 discusses some data indicating that selected Polish relational adjectives are able to act as antecedents for anaphoric expressions. Section 6 briefly compares relational and possessive (genitival) adjectives (terminating in *-in/-ow* suffixes) in terms of their anaphoric potential. Conclusions are drawn in Section 7.

## 2. Referential vs. Attributive Uses of Noun Phrases

Reference can be defined as a relationship between linguistic expressions and entities in the outside world (cf. Alexiadou et al. 2007; Abbott 2011; among others). Referring expressions point to some individuals or objects, e.g., the proper name *Barack Obama* indicates (or picks out) the individual who is the current president of the United States.

Noun phrases can be ambiguous between their referential and non-referential (i.e., attributive) interpretations. Donnellan (1966), mentioned in Abbott (2011), observes

1 I do not discuss here denominal qualitative adjectives, which can be distinguished from relational adjectives by a number of tests (see, among others, Cetnarowska 2013). For example, qualitative adjectives differ from relational ones in being felicitous in the predicative position and in deriving abstract nouns (e.g., *muzykalny* “musical” and *muzykalność* “musicality”). Qualitative adjectives can be formed by means of specialized suffixes, e.g., *-owaty* in *sloniowaty* “elephant-like, elephantine” in *sloniowaty chód* “elephantine gait.” However, the same form can usually be employed as a relational adjective (*stalowy* “made of steel” in *stalowy dach* “steel roof”) and as a qualitative one (*stalowy* “steely, resembling steel” in *stalowe nerwy* “steely nerves”).

that definite descriptions, such as *Smith's murderer*, have two uses. In their referential use, this definite description points to some person (e.g., the accused sitting in the courtroom). In its non-referential (i.e., attributive) use, the noun phrase in question describes someone who is responsible for Smith's death (whoever fits this description).

The distinction between individual denotation and property denotation of *de*-phrases in French is clarified by Kolliakou (1999). She proposes that some *de*-phrases pick out an entity in discourse and are thus individual-denoting phrases, treated as arguments of the head noun (as in [1] below).<sup>2</sup>

- (1) L'attaque des partisans a commencé à 7:00.  
 the attack of partisans has start.PST at 7:00  
 "The partisans' attack started at 7:00."  
 (from Kolliakou 1999, 736; her ex. [22])

Other *de*-phrases determine the type of an entity (e.g., a partisan-like attack in [2]) and can be regarded as property-denoting phrases. They are regarded by Kolliakou as modifiers, and not as arguments, of the head noun.

- (2) En ce moment, une attaque de partisans serait fatale.  
 at this moment an attack of partisans would-be fatal  
 "At this moment, a partisan attack would be fatal."  
 (from Kolliakou 1999, 736; her ex. [21])

Kolliakou (1999) discusses a set of syntactic diagnostics which can be employed to disambiguate the reading of a given *de*-phrase as an individual-denoting or a property-denoting one.<sup>3</sup> She observes, for instance, that pronominal anaphora is not felicitous with property-denoting expressions, such as the adjective *platonicien* "Platonic" or the phrase *de Karajan* "of Karajan." The sentence given in (3) is ill-formed if the possessive pronoun *son* "his" is coindexed with *platonicien* "Platonic." It is acceptable only in a different interpretation (as is indicated by #), namely when *son* "his" is deictic. The sentence in (4) is preceded by a question mark (and not by \* or #) since the phrase *de Karajan* "of Karajan" is in fact ambiguous here between property denotation and individual denotation.

<sup>2</sup> I introduced (very) slight modifications into the glosses originally provided by Kolliakou (1999) in her examples quoted here in (1)–(4), in order to make them uniform with the glosses of the remaining examples appearing in my paper.

<sup>3</sup> For example, according to Kolliakou (1999), the complex event reading of nominals is possible only with individual-denoting *de*-phrases as Themes. Moreover, property-denoting *de*-phrases stand closer to the head noun than individual-denoting *de*-phrases. Individual-denoting *de*-phrases cannot occur in indefinite NPs.

- (3) #L' amour            platonicien<sub>i</sub>        est    l'        idée        centrale  
 the    love            Platonic        is    the        idea        central  
 de    son<sub>i</sub>            'Banquet'.  
 of    his            'Symposium'  
 "Platonic love is the central idea of his 'Symposium.'"  
 (from Kolliakou 1999, 754; her ex. [50])

- (4) ?La            version    de    Karajan<sub>i</sub>    de    la        neuvième  
 the            version    of    Karajan    of    the        Ninth  
 a            été        son<sub>i</sub>    plus        grand        succès.  
 has        been     his    most        great        success  
 "The Karajan version of the Ninth has been his (= Karajan's) greatest success."  
 (from Kolliakou 1999, 756; her ex. [52b])

Kolliakou (1999) adds that the distinction between individual denotation and property denotation can be extended to genitive noun phrases, e.g., in Greek. Her proposal is applied to Russian by Trugman (2004), who compares referential genitive noun phrases in Russian (in [5a] and [5b]) with non-referential genitives (in [6a] and [6b]).

- (5) (a) konspekt            včerašnej            lekcii  
 summary.NOM        yesterday.ADJ.GEN        lecture.GEN  
 "the summary of yesterday's lecture"
- (b) kurtka            moego            brata  
 jacket.NOM        my.GEN            brother.GEN  
 "my brother's jacket"  
 (from Trugman 2004, 219; her exx. [2a] and [2b])
- (6) (a) promysel            pušniny  
 trade.NOM            fur.GEN  
 "fur trade"
- (b) ruki            muzykanta  
 hands.NOM        musician.GEN  
 "hands like those of a musician"  
 (from Trugman 2004, 219; her exx. [3a] and [3b])

The non-referential genitives are called "Type Genitives" by Trugman (2004), since they do not refer to particular individuals but to types of entities. She observes that they often correspond to relational adjectives in Russian (as indicated in [7a] and [7b]).

- (7) (a) sledy            tигра            →    tigrinye            sledy  
 tracks.NOM    tiger.GEN            tiger.ADJ.NOM.PL    tracks.NOM  
 “tiger tracks”
- (b) promysel        pušniny        →    pušnoj            promysel  
 trade.NOM    fur.GEN            fur.ADJ.NOM.SG    trade.NOM  
 “fur trade”  
 (from Trugman 2004, 222; her exx. [11a] and [11b])

Russian referential genitives, on the other hand, can be replaced by prenominal possessive (genitival) adjectives (if the latter are available, as in [8]).

- (8) (a) stol            Peti            →    Petin            stol  
 table.NOM    Peter.GEN            Peter.POSSADJ.NOM    table.NOM  
 “Peter’s table”
- (b) eda            koški            →    koškina            eda  
 food.NOM    cat.GEN            cat.POSSADJ.NOM    food.NOM  
 “the cat’s food”  
 (from Trugman 2004, 223; her exx. [13a] and [13b])

As stated by Corbett (1987), possessive adjectives (containing the suffixes *-in* or *-ov*) were derived from all animate nouns in Old Church Slavonic. Nowadays they are employed fairly commonly in some Slavic languages, including Serbian, Croatian, Slovenian, Upper Sorbian, Slovak, and Czech. Genitival adjectives are derived in Russian from a restricted set of nouns, mainly from first names, kinship terms, names of professions and animal names (as is shown in Babyonyshev [1997, 195–97]).

### 3. Referential and Non-Referential Genitives in Polish

Cetnarowska et al. (2011) employ similar diagnostic tests to those proposed by Trugman (2004) for Russian to distinguish between referential and non-referential (Type) genitives in Polish. For instance, Type Genitives can co-occur with referential expressions, such as possessive pronouns or referential genitives. Type Genitives stand closer to the head noun than referential genitives, as is shown by the example in (9), where the Type Genitive *pracy* “work.GEN” precedes the referential genitive *naszego menadzera* “our manager’s.”

- (9) narzędzie        pracy            naszego            menadzera  
 tool(N).NOM    work(F).GEN.    our.GEN.M            manager(M).GEN  
 “our manager’s work tool”  
 (from Cetnarowska et al. 2011, 283; their ex. [12a])

Moreover, the Type Genitive in (10a) cannot be replaced by a possessive pronoun, in contrast to the referential (Possessor) genitive in (10b).

(10) (a) \*jej narzędzie naszego menadżera  
 her/its tool(N).NOM our.GEN.M manager(M).GEN  
 \*‘‘its (= work’s) tool of our manager’’

(b) jego narzędzie pracy  
 his tool(N).NOM work(F).GEN  
 ‘‘his work tool’’

Type Genitives allow neither backward nor forward pronominalization. Thus, the pronoun *on* ‘‘he’’ in (11a) cannot be coindexed with the non-referential (i.e., Type) genitive *rybaka* ‘‘fisherman.GEN’’ occurring in the phrase *kurtka rybaka* ‘‘a fisherman’s jacket.’’ Similarly, if *górnika* ‘‘miner.GEN’’ is a Type Genitive in *mundur górnika* ‘‘a miner’s uniform,’’ it cannot be an antecedent for the pronoun *on* ‘‘he’’ in (11b). Type Genitives allow property anaphora, as shown in (11c), where *kapelusz pszczelarza* ‘‘a beekeeper’s hat’’ can be replaced by *taki kapelusz* ‘‘such a hat.’’

(11) (a) Skoro on<sub>i</sub> spędza dużo czasu na łodzi,  
 as he.NOM spends.3SG much time.GEN on boat.LOC  
 kurtka rybaka<sub>\*i</sub> musi zapewnić dobrą  
 jacket.NOM fisherman.GEN must.3SG provide.INF good.ACC  
 ochronę przed wiatrem i deszczem  
 protection.ACC against wind.INS and rain.INS  
 ‘‘As he<sub>i</sub> spends a lot of time on the boat, a fisherman<sub>\*i</sub>’s jacket must provide good protection from the wind and the rain.’’

(b) Zamierzałam kupić mundur górnika<sub>j</sub>, ale on<sub>\*j</sub>  
 intend.PST.1SG.F buy.INF uniform.ACC miner.GEN but he.NOM  
 nie chciał mi go sprzedać  
 not want.PST.1SG.M me.DAT him/it.ACC sell.INF  
 ‘‘I intended to buy a miner<sub>j</sub>’s uniform but he<sub>\*j</sub> didn’t want to sell it to me.’’

(c) Załóż kapelusz pszczelarza, bo tylko taki  
 put\_on.IMP.2SG hat.ACC beekeeper.GEN because only such.NOM  
 kapelusz zabezpieczy cię przed pszczołami  
 hat.NOM protect.FUT.3SG you.ACC.SG against bees.INS  
 ‘‘Put on a/the beekeeper’s hat, because only such a hat will protect you from (the) bees.’’

The presence of a relative pronoun following a genitive noun phrase is not compatible with the Type reading of the genitive phrase and calls for its referential interpretation (see [12]).

- (12) Dziś rano znaleźliśmy na brzegu kurtkę rybaka<sub>k</sub>,  
 today morning find.PST.1PL on coast.LOC jacket.ACC fisherman.GEN  
 który<sub>k</sub> zaginał podczas wczorajszego sztormu  
 which get\_lost.PST.3SG.M during yesterday.ADJ.GEN storm.GEN  
 “This morning on the coast we’ve found the jacket of the fisherman who  
 got lost during yesterday’s storm.”

The referential genitive in (13a) can be fronted, while the Type Genitive (in [13b]) cannot (cf. Migdalski [2002] for Polish, Trugman [2004] for Russian).

- (13) (a) kurtka tego rybaka →  
 jacket.NOM this.GEN fisherman.GEN  
 “the jacket of this fisherman”

tego rybaka kurtka  
 this.GEN fisherman.GEN jacket.NOM  
 “this fisherman’s jacket”

- (b) kurtka rybaka →  
 jacket.NOM fisherman.GEN  
 “a fisherman’s jacket”

\*rybaka kurtka  
 fisherman.GEN jacket.NOM  
 unacceptable in the Type reading “a fisherman’s jacket”

It is difficult to show that Polish referential genitives correspond to possessive (genital) adjectives (containing the suffixes *-in* or *-ow*) since the formation and usage of genitive adjectives is even more restricted in Polish than in Russian (cf. Corbett 1987, 314). Possessive adjectives in Polish are derived mainly from kinship terms and first names, but are generally perceived as old-fashioned, archaic or dialectal formations. Thus, *kurtka (tamtego) rybaka* “the jacket of that fisherman” cannot be felicitously replaced by *\*?kurtka rybakowa* “jacket.NOM. fisherman.POSS.ADJ” and nor can the phrase *kapelusz (tego) pszczelarza* “the hat of this beekeeper” be paraphrased as *\*?kapelusz*

*pszczelarzowy* “hat.NOM beekeeper.POSS.ADJ” since such possessive adjectives are not used by speakers of contemporary Polish.<sup>4</sup>

Non-referential (Type) genitives in Polish frequently correspond to relational adjectives, as is shown in (14):

- (14) (a) kurtka                      rybaka                      →  
           jacket.NOM                fisherman.GEN  
           “a fisherman’s jacket”

          kurtka                      rybacka  
           jacket.NOM                fisherman.ADJ.NOM  
           “a fisherman’s jacket”

- (b) kapelusz                    pszczelarza                    →  
           hat.NOM                    beekeeper.GEN  
           “a beekeeper’s hat”

          kapelusz                    pszczelarski  
           hat.NOM                    beekeeper.ADJ.NOM  
           “a beekeeper’s hat”

#### 4. Relational Adjectives as Anaphoric Islands

Since Type Genitives in Polish can often be replaced by relational adjectives, it comes as no surprise that the latter formations are generally said to be non-referential elements. They cannot be pronominalized, as is indicated in (15).

- (15) (a) Skoro            on<sub>i</sub>            spędza            dużo    czasu    na łodzi,  
           as            he.NOM        spends.3SG    much    time.GEN    on    boat.LOC  
           kurtka        rybacka<sub>\*i</sub>                            musi    zapewnić  
           jacket.NOM    fisherman.ADJ.NOM            must.3SG    provide.INF  
           ochronę        przed    wiatrem    i    deszczem  
           protection.ACC    against    wind.INS    and    rain.INS  
           “As he<sub>i</sub> spends a lot of time on the boat, a fisherman<sub>\*i</sub>’s jacket must provide protection from the wind and the rain.”

4 In a search carried on July 15, 2014, I found no attestation of the adjective *pszczelarzowy* “beekeeper.POSS.ADJ” in the National Corpus of Polish (NKJP). The formation *pszczelarzowa* “beekeeper.POSS.ADJ.F” undergoes substantivization and appears in the sense of “a wife of a/the beekeeper,” e.g., in the phrase *pani pszczelarzowa* “the beekeeper’s wife.”

- (b) Zamierzałam      kupić      mundur      górniczy<sub>j</sub>,      ale      on<sub>e,j</sub>  
 intend.PST.1SG.F    buy.INF    uniform.ACC    miner.ADJ.ACC    but    he.NOM  
 nie    chciał                      mi                      go                      sprzedać  
 not    want.PST.1SG.M    me.DAT                      him/it.ACC    sell.INF  
 “I intended to buy a miner<sub>j</sub>’s uniform but he<sub>e,j</sub> didn’t want to sell it to me.”

It is observed of denominal adjectives in other languages (including English) that they lack referentiality; therefore they are not accessible as antecedents for personal pronouns, possessive adjectives, reflexive pronouns or other anaphoric expressions. Relational adjectives differ in this respect from genitive NPs (and from possessive adjectives, as is illustrated in Section 6).

This type of contrast between relational adjectives and referential genitives in English is discussed by, among others, Baker (2003, 98) and Arsenijević et al. (2014, 21–22).

- (16) (a) Albania’s destruction of itself grieved the expatriate community.  
 (b) \*The Albanian destruction of itself grieved the expatriate community.  
 (cf. The Albanian self-destruction . . . )  
 (from Baker 2003, 98; his ex. [5])
- (17) (a) \*The American<sub>i</sub> proposal to the UN reveals its<sub>i</sub>/her<sub>i</sub> rigid position.  
 (b) America<sub>i</sub>’s proposal to the UN reveals its<sub>i</sub>/her<sub>i</sub> rigid position.  
 (from Arsenijević et al. 2014, 21; their ex. [9]).

Arsenijević et al. (2014) employ the data in (17) to argue against the hypothesis that relational adjectives should be represented as nouns in their syntactic representation. Such a hypothesis is adopted by proponents of Distributed Morphology, including Fábregas (2007), Marchis (2010), and Alexiadou and Stavrou (2011). However, Alexiadou and Stavrou (2011) account for the lack of ability of relational adjectives to control pronouns by recourse to the notion of anaphoric islands proposed by Postal (1969).

Postal (1969) notes that anaphoric reference is not available to elements which are either parts of the semantic interpretation of non-derived words or which are constituents of morphologically complex words. For instance, the word *pork* contains the meaning of the word *pig* (since *pork* can be paraphrased as “meat from pigs”), yet *pig* is not available as an antecedent for the pro-form *one* in the sentence \**The best pork comes from young ones*. Similarly, the pro-form VP *do so* cannot refer to the verb *smoke*, which is the derivational base of the affixal derivative *smoker*, cf. \**Smokers shouldn’t really do so*. Since morphologically complex words are barriers to anaphoric

reference, the nominal base of a relational adjective is not accessible to the rules of outbound anaphora. This predicts the ill-formedness of English sentences such as \**Her<sub>i</sub> enemies were pleased by the American<sub>i</sub> invasion of Vietnam*, in which the pronoun *her* is coindexed with the nominal base of the relational adjective *American*.

Postal's proposal to regard morphologically complex words as anaphoric islands is adopted in Cetnarowska (forthcoming) to explain why Polish denominal adjectives are (generally) unable to bind reflexive possessive pronouns or to control personal pronouns, as illustrated in (18a)–(d).

- (18) (a) problemy            wychowawcze<sub>?i</sub>            ze            swoj<sub>\*i</sub>            córką  
 problems.NOM    educational.NOM    with    REFL.POSS.INS.SG    daughter.INS  
 “educational problems with one's daughter”
- (b) rodzinne<sub>?j</sub>            wycieczki    dla    swoich<sub>\*j</sub>            pracowników  
 family.ADJ.NOM.PL    trips.NOM    for    refl.poss.gen.pl    employees.GEN  
 “family trips for one's employees”
- (c) sąsiedzka<sub>?k</sub>            pomoc            w            wychowaniu  
 neighborly.NOM    help.NOM            in            raising.LOC  
 swoich<sub>\*k</sub>            dzieci  
 refl.POSS.GEN.PL    children.GEN  
 “neighborly help in raising one's children”
- (d) Wybieram            szkolne<sub>?m</sub>            wycieczki    bo  
 choose.PRS.1SG    school.ADJ.ACC.PL    trips.ACC    because  
 lubię            spędzać            z            ni<sub>\*m</sub>            czas.  
 lubię            spend.INF            with            her/it.INS    time.ACC  
 “I choose school<sub>m</sub> trips because I like spending time with her/it<sub>\*m</sub>.”

The denominal base of the relational adjective *wychowawczy* “educational,” i.e., *wychowawca* “tutor, educator,” is not visible to the reflexive possessive pronoun *swoj* “one's own” in (18a). Nor is the noun *rodzina* “family” able to bind the reflexive possessive *swoich* “one's own” in (18b) (to get the interpretation where the employees would be employed by the family). Moreover, the denominal adjective in (18c) could be treated as a qualitative adjective, paraphrasable as “typical of neighbors,” rather than a relational adjective “pertaining to neighbor(s),” which also predicts the “invisibility” of its base noun *sąsiad* “neighbor” for syntactic purposes. Finally, (18d) shows that the noun “underlying” the relational adjective *szkolne* “school.ADJ.ACC.PL,” i.e., the feminine declension noun *szkola* “school,” is not available as an antecedent for the personal pronoun *ni* “her/it.INS.”

## 5. Polish Relational Adjectives as Antecedents for Pronouns

It seems, however, that in some contexts relational adjectives in Polish are able to act as antecedents for reflexive possessive pronouns, as illustrated in (19).<sup>5</sup>

- (19) (a) *górnicy<sub>i</sub>*                      protest                      w                      obronie  
 miner.ADJ.NOM.SG                      protest.NOM                      in                      defense.LOC  
*swoich<sub>i</sub>*                      miejsc                      pracy  
 refl.POSS.GEN.PL                      places.GEN                      work.GEN  
 “miners<sub>i</sub>’ protests in defense of their<sub>i</sub> workplaces”
- (b) *prezycenckie<sub>j</sub>*                      próby                      obrony  
 presidential.NOM.PL                      attempts.NOM                      defense.GEN  
*członków*                      *swojej<sub>j</sub>*                      rodziny  
 members.GEN                      REFL.POSS.GEN.SG                      family.GEN  
 “The President<sub>j</sub>’s attempts at defending the members of his<sub>j</sub> family”
- (c) *studencie<sub>k</sub>*                      apele                      o                      poparcie  
 student.ADJ.NOM.PL                      appeals.NOM                      for                      support.ACC  
*dla swoich<sub>k</sub>*                      profesorów  
 for REFL.POSS.GEN.PL                      professors.GEN  
 “students<sub>k</sub>’ appeals for support for their<sub>k</sub> professors”

Such examples are difficult to find in electronic corpora (e.g., in the National Corpus of Polish), since reflexive possessive pronouns can be regarded here as superfluous and are most likely to be omitted. The omission of reflexive possessive pronouns is attested in example (20), found by me in a web search carried out on July 20, 2014.<sup>6</sup>

5 An additional issue which deserves further study (beyond the scope of this article) is the placement of Polish relational adjectives. Classifying adjectival modifiers in Polish typically occur in the post-head position, in contrast to qualifying modifiers, which are placed pre-nominally. This is discussed by, among others, Willim (2001), Rutkowski and Progovac (2005), Cetnarowska et al. (2011). Classifying (i.e., non-qualifying) adjectives can occur in the pre-head position as a result of stylistic or information structure requirements (as is argued by Cetnarowska [2014]). The data in (19) indicate that the argument-like status may be another factor influencing the placement of adjectives in a Polish noun phrase, as is also suggested by Linde-Usiekiewicz (2013). However, quick searches of the National Corpus of Polish (carried out by me on August 31, 2014) show that relational adjectives with the Agent reading can be placed either pre- or post-nominally; cf. ten occurrences of N+A *wizyta papieska* (lit. visit papal) “a/the papal visit” vs. seven occurrences of A+N *papieska wizyta* (lit. papal visit) “a/the papal visit.”

6 This is a shortened version of the sentence attested at the following website: <http://www.rmf24.pl/fakty/news-radni-bytomia-popieraja-gorniczy-protest,nId,140125>.

- (20) Radni                                      Bytomia (...)                                      popierają                                      górnicze  
 councillors.NOM                                      Bytom.GEN                                      support.PRS.PL                                      miner.ADJ.ACC.PL
- protesty                      w                      obronie                      miejsc                      pracy  
 protests.ACC                      in                      defense.LOC                      places.GEN                      work.GEN
- “The Councillors of the city of Bytom . . . support miners,<sub>i</sub>’ protests in defense of (their<sub>i</sub>) workplaces.”

The reflexive possessive pronoun becomes necessary if (19a) is contrasted with (21a), while (19b) is compared with (21b).

- (21) (a) górniczy                                      protest                      w                      obronie  
 miner.ADJ.NOM.SG                                      protest.NOM                      in                      defense.LOC
- waszych                      miejsc                      pracy  
 your(pl).GEN.PL                      places.GEN                      work.GEN
- “miners’ protests in defense of your(pl) workplaces”
- (b) prezydenckie                                      próby                      obrony                      rodziny  
 presidential.NOM.PL                                      attempts.NOM                      defense.GEN                      family.GEN
- jako                      podstawowej                      komórki                      społeczeństwa  
 as                      basic.GEN.SG                      cell.GEN                      society.GEN
- “President’s attempts at defending the family as a basic unit of society”

The adjectives *górniczy* “pertaining to miners” and *prezydenckie* “presidential” in (19) and (21) can be treated as referential formations. This can be supported by some of the tests mentioned for identifying referential genitives in Polish. They can be replaced by possessive pronouns, genitive noun phrases or agentive adjuncts, as shown in (22a), (22a’), which correspond to (19a), and in (22b), (22b’), which correspond to (19b).

- (22) (a) ich<sub>i</sub>                                      protest                      w                      obronie  
 their.NOM.SG                                      protest.NOM                      in                      defense.LOC
- swoich<sub>i</sub>                                      miejsc                      pracy  
 REFL.POSS.GEN.PL                                      places.GEN                      work.GEN
- “their<sub>i</sub>’ protests in defense of their<sub>i</sub> workplaces”
- (a’) protest                                      górników<sub>i</sub>                                      w                      obronie  
 protest.NOM                                      miners.GEN                                      in                      defense.LOC
- swoich<sub>i</sub>                                      miejsc                                      pracy  
 REFL.POSS.GEN.PL                                      places.GEN                                      work.GEN
- “miners<sub>i</sub>’ protests in defense of their<sub>i</sub> workplaces”





Moreover, while non-thematic (classificatory) adjectives are not likely to provide antecedents for personal pronouns, as was shown in (18d), thematic adjectives can occasionally act as antecedents for such pronouns, as is indicated in (25).

- (25) (a) Denerwują<sub>i</sub>                      mnie            lekarskie<sub>i</sub>                      strajki.  
 annoy.PRS.3SG                      me.ACC            physician.ADJ.NOM.PL            strikes.NOM  
 Oni<sub>i</sub>            zarabiają                      o            wiele            więcej            niż            ja.  
 they.NOM            employ.PRS.PL                      about            much            more            than            I.NOM  
 ‘I’m annoyed by the physicians,’ strikes. They<sub>i</sub> earn much more than I do.’”
- (b) Obawiamy            się            górniczych<sub>j</sub>                      protestów,            bo            oni<sub>j</sub>  
 fear.PRS.1PL            REFL            miner.ADJ.GEN.PL                      protests.GEN            as            they.NOM  
 potrafia<sub>j</sub>            zdemolować                      centrum                      miasta.  
 can.PRS.3PL            demolish.INF                      center.ACC                      city.GEN  
 ‘We fear miners,’ protests, because they<sub>j</sub> can demolish the city center.’”

It can be pointed out that the relational adjectives which appear to be able to control personal pronouns in (25) and bind reflexive possessive pronouns in (19) are group adjectives (cf. Grimshaw 1990; Alexiadou and Stavrou 2011; Marchis 2010), which identify groups of individuals exhibiting a given characteristic.

## 6. Ambiguity between Referential and Non-Referential Usage of Polish Denominal Adjectives

The ambiguity between referential and non-referential readings is discussed in the literature not only for postnominal genitives, but also for prenominal genitives or possessive modifiers.

Rosenbach (2007), for instance, observes that the Saxon genitive in English is referential when used as a specifying s-genitive (“whose X?”) in (26a), while it is a classifying s-genitive in (26b):

- (26) (a) the girl’s eyes  
 (b) a driver’s license

Possessive (genital) adjectives attested in the National Corpus of Polish either occur in their (predicted) referential interpretation (see [27]) or develop a non-referential (classificatory or qualitative) reading (as in [28]).

- (27) mąż                    jednej            z            babcinych                    sióstr  
 husband.NOM        one.GEN        from        grandma.POSS.ADJ.GEN.PL        sisters.GEN  
 “the husband of one of grandma’s sisters” [NKJP, fiction, Krystyna Janda and  
 Bożena Janicka *Gwiazdy mają czerwone pazury*]
- (28) Emma                    Watson            /        Hermiona            skończyła            z  
 Emma.NOM                Watson.NOM        Hermione.NOM        finish.PST.3SG.F            with  
 tweedowymi                    spódniczkami            i  
 tweed.ADJ.INS.PL                skirts.INS                and  
 babcynymi                    sweterkami.  
 grandma.POSS.ADJ.INS.PL        sweaters.DIM.INS  
 “Emma Watson/Hermione no longer wears tweed skirts and grandma-like  
 sweaters.” [NKJP, newspapers, *Słowo Polskie Gazeta Wrocławska*]
- Corbett (1987) points out that nouns underlying Slavic possessive adjectives exhibit some syntactic visibility. In languages such as Upper Sorbian, possessive adjectives are able to control relative pronouns, personal pronouns and reflexive possessive pronouns. In Polish the control potential of possessive adjectives is limited, yet when they occur in their referential reading, genitival *-in/-ow* adjectives are able to control personal pronouns, possessive pronouns, or possessive reflexives. This is illustrated in (29)–(31).
- (29) Skupiam            wzrok            na        babcinych<sub>i</sub>                    bruzdach            na  
 focus.PRS.1SG        sight.ACC        on        grandma.POSS.ADJ.LOC.PL        furrows.LOC        on  
 czole.            Jaka            ona<sub>i</sub>            biedna,            niezdarna.  
 forehead.LOC        what.NOM.SG.F        she.NOM        poor.NOM.SG.F        clumsy.NOM.SG.F  
 “I’m focusing my eyes on the furrows on Grandma’s forehead. How poor and  
 clumsy she is.” [NKJP, fiction, Dawid Kornaga *Gangrena*]
- (30) Co                    babcina<sub>j</sub>                    kuchnia            to  
 what.NOM                grandma.POSS.ADJ.NOM.SG                cuisine.NOM            TOP  
 babcina<sub>j</sub>                    kuchnia.            I            na        koniec            jej<sub>j</sub>  
 grandma.POSS.ADJ.NOM.SG        cuisine.NOM                and        on        end.ACC            her.NOM.SG  
 numer            popisowy –                    domowa            karpátka.  
 number.NOM        show\_off.ADJ.NOM.SG.M                home.ADJ.NOM.F            Carpathian.NOM  
 “Nothing compares to (my) grandma’s cuisine. And at the end her spectacular  
 dish: a home-made Carpathian cake!” [NKJP, fiction, Kinga Dunin *Obciach*]

- (31) *babcina<sub>k</sub>*                      *duma*  
 grandma.POSS.ADJ.NOM.SG    pride.NOM  
*ze swoich<sub>k</sub>*                      *wnuków*  
 from REFL.POSS.GEN.PL        grandchildren.GEN  
 “grandma’s pride in her grandchildren”

The difference between relational adjectives and possessive (genitival) adjectives with respect to their control of anaphoric expressions is exemplified in Czech by the data in (32) taken from Veselovská (2014, 116) and in Russian by the data in (33), quoted from Babyonyshev (1997, 203).

- (32) (a) *žen-in-o<sub>i</sub>*                      *obvyklé*                      *mluvení*                      *o*                      *sobě<sub>i/\*j</sub>*  
 woman.POSS.ADJ-<sub>j</sub>                      usual                      talking                      about                      self<sub>i/\*j</sub>  
 “woman’s<sub>i</sub> usual talking about herself<sub>i/\*j</sub>”
- (b) *žen-ské<sub>i</sub>*                      *věčné*                      *mluvení*                      *o*                      *sobě<sub>\*i</sub>*  
 feminine.ADJ-<sub>i</sub>                      permanent                      talking                      about                      self<sub>\*i</sub>  
 “feminine<sub>i</sub> permanent talking about ??self<sub>\*i</sub>”  
 (from Veselovská 2014, 116; her exx. [17b] and [17c])
- (33) (a) *Ja*                      *prinesla*                      *Nadinu<sub>i</sub>*                      *knigu.*                      *Ona<sub>i</sub>*  
 I.NOM                      bring.PST.1SG.F                      Nadia.POSS.ADJ                      book                      she.NOM  
*prosila*                      *ee*                      *segodnja*                      *vernut’.*  
 ask.PST.3SG.F                      it                      today                      return.INF  
 “I brought Nadja’s book. She asked [me] to return it today.”
- (b) *?Ja*                      *prinesla*                      *detskiju<sub>i</sub>*                      *knigu*                      *Oni<sub>\*i</sub>*                      *prosili/*  
 I.NOM                      bring.PST.1SG.F                      children.ADJ                      book                      they                      ask.PST.PL  
*on<sub>\*i</sub>*                      *prosil*                      *ee*                      *segodnja*                      *vernut’.*  
 he                      ask.PST.3SG.M                      it                      today                      return.INF  
 “I brought a children’s book. They/he asked [me] to return it today.”  
 (from Babyonyshev 1997, 2003; her exx. [15a] and [15b])

Having examined the data from Polish, we can notice that the difference between relational and possessive (genitival) adjectives in their potential for anaphoric control is not so evident here as in other Slavic languages. Polish relational adjectives (especially group adjectives derived from animate nouns), e.g., *górnicy* “pertaining to miners,” *prezydencki* “presidential,” or *lekarski* “pertaining to physicians,” are ambiguous between their referential usage and non-referential usage. Although they are most frequently employed as non-referential elements, they can be given a refer-

ential reading when they occur as thematic satellites. In such a case they come close to genitival adjectives and, consequently, they can bind possessive reflexives and control personal pronouns.

## 7. Conclusion

This paper discussed the issue of (the lack of) referentiality of relational adjectives in Polish. It was shown that although relational adjectives are usually unable to act as antecedents for anaphoric expressions, in selected contexts they can control reflexive possessives or be antecedents for personal pronouns. This anaphoric potential was exemplified above for thematic (i.e., argument-like) relational adjectives, which can be treated as saturating theta-roles licensed by their head (event-denoting) nouns.

Thus, the border between relational adjectives and possessive adjectives is blurred in Polish and both classes of denominal adjectives can exhibit referential and non-referential readings (although the referential interpretation is rare for relational adjectives).

Furthermore, the data considered in Section 5 suggest that thematic relational adjectives in Polish contain syntactically active underlying nouns in their representations, as is argued for relational adjectives in Spanish, Greek, and Romanian in Fábregas (2007), Alexiadou and Stavrou (2011), and Marchis (2010).

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# Intervention Effects: Negation, Universal Quantifiers, and Czech

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**Abstract:** This article argues for an explanation of the intervention effect in NPI licensing which arises from intervening presuppositions. It focuses on two particular phenomena in Slavic languages: specific interpretation of universal NPs and neg-raising. In both cases existential presuppositions disrupt the licensing of NPIs, unlike the homogeneity presupposition. Both types of environments support Homer's program where both presuppositions and NPI checking take place in time, so different types of presuppositions can interrupt the licensing of NPIs depending on both their timing properties. Moreover this article shows the existence of neg-raising in Slavic languages, invalidating previous claims of Boškovič and Gajewski to the contrary.

**Keywords:** formal semantics; Slavic languages; NPIs; presuppositions.

## 1. Beyond the Frege Boundary: Licensing of NPIs

### 1.1 Introduction

This article deals with the licensing of Negative Polarity Items (NPIs), the relationship of this licensing to phenomena beyond the literal meaning of the sentences where NPIs occur, and generally on the breaking of the NPI licensing by presuppositions.<sup>1</sup> Empirically I will address data taken mainly from Czech, but I assume that the specific Czech data represent Slavic languages as a family; as a preliminary verification of this assumption, I will briefly look at Polish and Bulgarian. Let us introduce the empirical territory in the form of an example: (1) represents a case where either NPIs (*sebelehčí otázky*

<sup>1</sup> I would like to sincerely thank Jakub Dotlačil, Katja Jasinskaja, an anonymous reviewer, and the audience at the Olinco 2014 conference for their helpful questions and comments.

“even the easiest questions”) or n(egative)-words (*žádné* “no”) need to be licensed by a valid licenser (verbal negation in this example). This goes well if there is an indefinite NP like *třem studentům* “three students” between the licenser (negation) and the licensee (NPI/n-word), but goes wrong if a universal quantifier (*všem studentům* “all students”) is sandwiched between them. The intervention configuration has a general structure (reminiscent of syntactic interventions) of the form \*[Licensor [Universal\_ quantifier . . . Licensee]], so the same ungrammaticality also obtains in cases where the NPI/n-word is in an object position, the universal quantifier in a subject position, and the sentence is negated. This sort of Slavic intervention example was first discussed by Błaszczak (2001), where they are subsumed under Linebarger’s Immediate Scope Constraint. In this section I will introduce the current standard reasoning about such semantic intervention effects in NPI licensing.

- (1) Petr nedał \*všem studentům/třem studentům žádné/sebelehčí otázky  
 Petr give-NEG all students/three students no/even-the-easiest questions  
 “Peter didn’t give \*all students/three students any/even the easiest questions.”

Current standard accounts of NPI licensing can be found in influential studies by Chierchia (2004; 2013) and Gajewski (2011), a.o., and I briefly sketch their line of explanation for the intervention phenomena. Both Gajewski and Chierchia follow the Ladusaw style of NPI theories: NPIs are licensed by entailment reversing operators (negation being the most frequent of them), which are called downward entailing operators (a formal definition from Gajewski [2005] is given in [2]). An NPI (or n-word) is then licensed if it occurs in an environment which is downward entailing owing to an expression appearing in it which is downward entailing itself (again, the formal definition according to Gajewski is given in [3]). These are totally basic assumptions with respect to licensing of NPIs. Based on them we would expect (1) to be grammatical as there is a DE operator (negation, or  $\beta$  from [3]), and consequently the NPIs/n-words ( $\alpha$  from [3]) should be licensed. The basic answer of Gajewski/Chierchia with regard to intervention is that we have to look beyond Frege’s truth conditions in cases like this. The empirical generalization which relates all intervention cases is that existential implicature can break licensing of NPIs as it renders the strong (in the sense of summing truth conditions and implicatures) meaning of the sentence non-downward entailing.

- (2) Downward-entailingness: A function  $F$  whose type ends in  $t$  is Downward-entailing (DE) iff for all  $A, B$  in the domain of  $F$  such that  $A \Rightarrow B$ ,  $F(B) \Rightarrow F(A)$ .
- (3) Licensing Condition (modified after Gajewski [2005]): An NPI  $\alpha$  is licensed in a sentence  $S$  only if there is an eligible constituent  $\beta$  of  $S$  containing  $\alpha$  such that  $\beta$  is DE with regard to the position of  $\alpha$ .

Let me demonstrate on (1) and its predicate logic representation (4) the claim that implicatures break licensing of NPis. (4) is pseudo-English sentence representing Czech (1) and its Frege truth conditions are in (4a). As demonstrated by the valid entailment in (4d), on the assumption that hard questions are subset of questions, these literal truth conditions are downward entailing. But (4) also has a pragmatic implicature, triggered by the universal quantifier in the scope of negation; the implicature (paraphrasable as *Petr did give some students some questions*) is formally represented in (4b). This implicature is not downward entailing, as (4e) shows. Even intuitively, if it is true that Peter gave some students some questions, it does not follow that Peter gave them hard questions. Generally, existential implicature breaks the downward entailing character of the environment and consequently NPis/n-words are unlicensed. Indefinite NPs like *třem studentům* “three students” from (1), on the other hand, do not give rise to such existential implicatures and they do not break licensing of NPis.

- (4) \*Peter didn't give every student even the easiest questions.
- (a) assertion:  $\neg\forall x[\textit{student}'(x) \rightarrow \exists y[\textit{question}'(y) \wedge \textit{give}'(\textit{Peter}, x, y)]]$
- (b) implicature: based on the negation of the scalar alternative  $\langle \textit{some}, \textit{all} \rangle$   
 $\neg\neg\exists x[\textit{student}'(x) \wedge \exists y[\textit{question}'(y) \wedge \textit{give}'(\textit{Peter}, x, y)]] =$   
 $\exists xy[\textit{student}'(x) \wedge \textit{question}'(y) \wedge \textit{give}'(\textit{Peter}, x, y)]$
- (c) I  $[[\textit{hard\_question}]] \Rightarrow [[\textit{question}]]$
- (d)  $\neg\forall x[\textit{student}'(x) \rightarrow \exists y[\textit{question}'(y) \wedge \textit{give}'(\textit{Peter}, x, y)]] \Rightarrow \neg\forall x[\textit{student}'(x) \rightarrow \exists y[\textit{hard\_question}'(y) \wedge \textit{give}'(\textit{Peter}, x, y)]]$
- (e)  $\exists xy[\textit{student}'(x) \wedge \textit{question}'(y) \wedge \textit{give}'(\textit{Peter}, x, y)] \not\Rightarrow \exists xy[\textit{student}'(x) \wedge \textit{hard\_question}'(y) \wedge \textit{give}'(\textit{Peter}, x, y)]$

That subsumes general consensus in the field today: licensing of NPis is sensitive to downward entailing properties of their environment, where the properties have to be checked both in literal truth-conditions and in implicatures as well. For a reader familiar with the standard Gricean account of implicature as a defeasible, non-literal part of meaning, this view can be a bit surprising. However, as Chierchia and Gajewski urge us, we should ignore the fact that implicatures can be overridden by context and pay attention to their recursive meaning contribution to the sentence, because NPis pay attention to the recursive contribution of implicatures.

If we take for granted that implicatures can interfere with the licensing of NPis, the cases like (1) are easy to explain. Nevertheless, as further research has revealed, not all examples of NPI intervention are derivable only from implicatures. There is another

set of cases where the licensing of NPIs is sensitive to the not-at-issue meaning, namely contexts where presuppositions seem to be intervening between licensors and NPIs in a way similar to implicatures. A particularly influential treatment of such downward-entailment-breaking expressions beyond implicatures can be found in Homer (2008a; 2008b; 2010) where numerous examples of presuppositions intervening in licensing of NPIs are scrutinized. The aim of this article is to further extend Homer's claims about presuppositions as a potential source of intervention in NPI licensing. The extension is both empirical and theoretical: I will present new data (from Slavic languages) supporting Homer's claims, but I will furthermore propose some partial extensions of Homer's ideas with respect to the nature of the intervening presuppositions.

## 1.2 Standard Generalization

Despite the fact that implicatures are generally taken to be NPI-licensing breakers, this is not as generally accepted for presuppositions, even if presuppositions and implicatures of course both belong to the not-at-issue part of meaning, leading us to expect that presuppositions can theoretically behave similarly to implicatures even in this respect. This innocence of presuppositions (in the sense of not breaking the NPI-licensing) is even taken as sort of starting point by many researchers in the NPI field, for good reasons. First of all, the influential study by von Stechow (1999) very convincingly discusses presupposition triggers like emotive factives (predicates of the *sorry* or *surprise* type) and the focus-sensitive operator *only* which license NPIs in their scope, as demonstrated, e.g., by the grammaticality of a sentence like *Peter is sorry that Mary drank any beer*. Von Stechow (1999) shows how to bring these items under the umbrella of downward entailing operators, because at least some of them are not downward entailing in the strict sense. Let us check this presuppositionality on an example of the cognitive factive predicate *be sorry*. First, there is a subset relationship between the denotation of the word *beer* and the denotation of the word *beverage* (5). Second, if Peter is sorry that something happened, then Peter has to believe that something happened (5a), so if Peter is sorry that Mary drank beer or beverages, then Peter has to believe that Mary drank beer or beverages (5a)–(5b). But there is no downward entailment between the presupposition of (5a) and the presupposition of (5b). In other words, the presuppositions of the factive predicate *be sorry* are not downward entailing (5c), and not even upward entailing (5d). But NPIs are licensed in the scope of the predicate *be sorry*. A reasonable conclusion is that for this sort of predicate, presuppositions do not break the licensing of NPIs. This was for a long time the sort of consensus explicitly stated in (6), where the reasoning is generalized to all NPIs.

(5)  $[[beer]] \Rightarrow [[beverage]]$

(a) Peter is sorry that Mary drank a beverage.

*Presupposition:* Peter believes that Mary drank a beverage.

(b) Peter is sorry that Mary drank a beer.  
*Presupposition:* Peter believes that Mary drank a beer.

(c) (5a)  $\nRightarrow$  (5b)

(d) (5b)  $\nRightarrow$  (5a)

(6) **Standard generalization:** Presuppositions never disrupt the licensing of English NPis.

The technical way to get rid of presuppositions which are rightly non-downward entailing is proposed by von Stechow as follows (I simplify his account). Let us look at an example of another presuppositional NPI licenser, the focus sensitive operator *only*. A sentence like (7) presupposes that John drank some beer for breakfast and asserts that nobody else did so. IPA is certainly a subset of beer (8a) but there is no downward entailing relationship between (8b) and (8c). The way to overcome this for von Stechow is to include the presupposition of the conclusion of an imaginary argument into the premises. Thus (9c) has the presupposition that John drank IPA for breakfast, and if we put this presupposition into the argument as a premise (9a), the argument (9a)–(9c) becomes valid. Von Stechow (1999) calls this “filtering out” of the presupposition’s Strawson entailment, and it became one of the standard techniques in the NPI literature. Von Stechow himself applies this reasoning to *only*, emotional factives, antecedents of conditionals, and many other environments.

(7) Only John drank any beer for breakfast.

(8) (a)  $[[IPA\_beer]] \Rightarrow [[beer]]$

(b) Only John drank beer for breakfast.  $\nRightarrow$

(c) Only John drank IPA beer for breakfast.

(9) Strawson entailment:

(a) *Presupposition of the conclusion:* John drank IPA beer for breakfast.

(b) *Premise:* Only John drank beer for breakfast.  $\Rightarrow$

(c) Only John drank IPA beer for breakfast.

However, the whole picture is not so unequivocal as it would seem from von Stechow’s perspective: as discussed carefully and at length by Homer (2010), there are too many

cases where NPis are unlicensed and where the only culprit is the presupposition, so (6) cannot be right tout court. As witnessed by a sentence like (10a), in the context (10), French weak NPis of the *quoi que ce soit* “anything” type are unlicensed by the factivity of the embedding verb *sait* “know” even in the subjunctive mood of the embedded clause (glosses with SUBJ in [10a]). Therefore sentence (10a) is ungrammatical, as shown by the grammaticality of (10b) without an NPI (glossed as “something”—[10b] contains a regular pronoun, not an NPI pronoun). This is totally unexpected if we adopt (6) as a general hypothesis. On the other hand, data like (7) show, in some languages, some presuppositions at least are not disruptors of NPI licensing.

(10) *Context*: Marie read a novel.

(a) \*Jean ne sait pas que Marie a lu quoi que ce soit SUBJ.

*Intended*: “Jean doesn’t know that Marie read anything.”

(b) Jean ne sait pas que Marie a lu quelque chose (“something”).

(c) *Presupposition of (10b)*: Marie read something.

Moreover it seems that strict NPis are always sensitive to presuppositions, even in English. Consider an example like (11), taken from Homer (2010, ex. [46]). The presupposition trigger *too* unlicenses the strict NPI *until the next day*, which would be otherwise licensed by the embedding negation (see 13a). The same is true for another strict NPI *in years* as shown by (12)—Homer’s (2010) example (47)—and again, (13b) confirms that this effect is caused the presupposition trigger *too*.

(11) *Context*: Mary left the next day.

\*I don’t think that [Kevin]<sub>F</sub> left until the next day too.

(12) *Context*: Edwin works out three days a week.

\*I don’t think that [Kevin]<sub>F</sub> has exercised in years too.

(13) *Controls*:

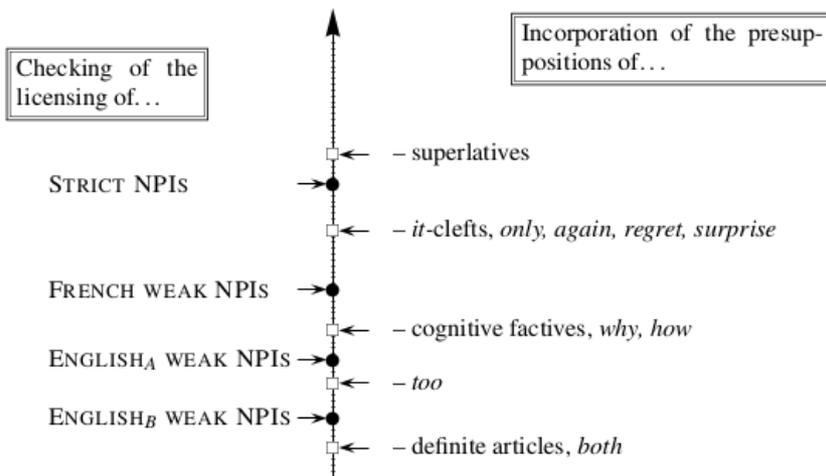
(a) I don’t think that Kevin left until the next day.

(b) I don’t think that Kevin has exercised in years.

So it seems we face a sort of paradoxical situation: presuppositions sometimes intervene in the licensing of NPis (the French *know* case, English strict NPis), but sometimes they do not (*only*, English cognitive factives). What seems to be certain is that

a simple generalization like (6) cannot account for this sort of complex data. Gajewski and Chierchia draw a similar conclusion with respect to this phenomenon. Weak NPIs are sensitive to the downward entailment of their licensers but not to their scalar/presuppositional properties; strict NPIs, on the other hand, pay attention to both the truth-conditional and non-truth-conditional meaning of their licensers/environment. However, Homer suggests that the landscape of NPIs is even more nuanced: both weak and strict NPIs pay attention to both types of meaning, truth-conditional and non-truth-conditional. They differ in terms of their timing of the licenser checking; weak NPIs check their licensers before strict NPIs. Moreover, different presuppositions are introduced at different times. Consequently, weak NPIs can behave as non-sensitive to the presuppositional properties of their environment simply because they are integrated into the meaning of the sentence before the respective presupposition.

I would like to adopt Homer's suggestion that the picture slowly revealed is the following: there is modularity and timing in the checking of NPIs and the integration of presuppositions into the meaning of a sentence. Thus presuppositions are cyclically included into the meaning of sentences and this timing can result in the apparent innocence of presuppositions with regard to NPI licensing. Consider Figure 1 (Homer's [2010] Figure 3.1). English weak NPIs, e.g., are not interrupted by the presuppositions of cognitive factives because in English (unlike French) they are checked before the presuppositions of the cognitive factives are included in the sentence meaning. I assume that this picture is basically right and for details I refer the reader to Homer's original work.



**Figure 1.** Timing of NPIs and presuppositions

## 2. Analysis

### 2.1 Illustrative Case 1: The Universal Quantifier

This section will discuss the first case empirically supporting Homer's claim that presuppositions (but only presuppositions of a certain type) intervene in the licensing of NPIs. It is a case of the universal quantifier and two types of presuppositions which can be associated with it, depending on the nature of the NP where the universal quantifier occurs. I assume, with many others, that pure universally quantified NPs like *all vodyanoy* bear an existential presupposition, so a sentence like *All vodyanoy smoke pipes* would be (at least in the actual world) false/undefined as its existential presupposition is not satisfied. Presuppositional explanation of the oddity of example (1) would then be nearly identical to the mainstream implicature approach: existential presupposition breaks the downward entailing environment and consequently all NPIs are unlicensed. However, if we universally quantify not over bare Ns but over specific NPs like in (14), the cumulative presupposition of a universal specific NP like *všichni ti studenti, kteří přišli pozdě* "all the students who came late" is not existential but maximal/homogeneous in the sense discussed below. What is of the most importance is the finding that a change of the presupposition from existential to homogenous leads to acceptability of the NPI in (14). Thus (1) and (14) form a minimal pair where the unacceptability/acceptability of NPIs correlates with the existential/non-existential status of the presupposition.

- (14) Petr nedal všem těm studentům, kteří přišli pozdě, žádnou/sebemenší šanci.  
 "Peter didn't give all the students, who came late, any/even the smallest chance."

For the maximality presupposition of universal specific NPs, I follow the spirit of Brisson (2003) where she claims that the essential semantics of this sort of NP consists of the maximizing effect observable in the interpretation of sentences like *All the students gathered in the hall*, where intuitively every member of the salient set of students has to participate in the gathering event. In formalizing this intuition, I follow the work of Beck (2001) and Gajewski (2005), who claim that all definite NPs give rise to such maximality requirements, which they call the homogeneity presupposition. Consider (15): both the subject and object arguments are definite, therefore interpreted maximally, and the homogeneity presupposition leads to an excluded-middle reading which in this particular case leads to an interpretation paraphrasable as *None of the women knows any of the men* (formalized in [15a]). A reading allowing partial ignorance between the set of the women and the set of the men (15b) contradicts the homogeneity presupposition and consequently it is unavailable as a reading for (15).

(15) The women don't know the men.

$$(a) \forall x[x \in \text{woman}' \rightarrow \forall y[y \in \text{man}' \rightarrow \neg \text{know}'(x, y)]]$$

$$(b) * \neg \forall x[x \in \text{woman}' \rightarrow \forall y[y \in \text{man}' \rightarrow \text{know}'(x, y)]]$$

Let us assume that the presupposition associated with universal NPs in natural language depends on whether the NP is bare ( $\rightarrow$  existential presupposition) or specific ( $\rightarrow$  all-or-nothing/homogeneous presupposition). For the validity of this claim, based on a large corpus study, see Dočekal and Strachoňová (2014). Formally, I express this intuition in (16a), with the usual existential presupposition associated with bare universal NPs, as opposed to (16b), where the homogeneity presupposition is associated with universal specific NPs.

$$(16) (a) \llbracket \text{bare } \forall \rrbracket = \lambda P \lambda Q : \exists x[P(x)]. \forall x[P(x) \rightarrow Q(x)]$$

$$(b) \llbracket \text{specific } \forall \rrbracket = \lambda P \lambda Q : [\forall x[P(x)]] \vee [\forall x[\neg P(x)]]. \forall x[P(x) \rightarrow Q(x)]$$

The interplay of presuppositional and assertional meaning is shown in (17). The presupposition of homogeneity (17a) and the assertion (17b) lead to the low scope interpretation of negation with respect to the universal quantifier, a situation analogous to example (15). The resulting interpretation in (17c) is downward entailing, as can be seen from the validity of an inference  $\forall x[\text{student}'(x) \rightarrow \neg \text{give\_chance}(\text{Petr}, x)] \rightarrow \forall x[\text{student}'(x) \rightarrow \neg \text{give\_smallest\_chance}(\text{Petr}, x)]$ . The interplay of the presupposition and the assertion leads to a negation scope where the universal quantifier is kicked out of the intervening position, therefore no intervention consequently occurs.

(17) Peter didn't give all the students, who came late, any/even the smallest chance.

(a) *Presupposition of homogeneity*

$$(i) \forall x[\text{student}'(x) \rightarrow \text{give\_chance}(\text{Petr}, x)] \vee$$

$$(ii) \forall x[\text{student}'(x) \rightarrow \neg \text{give\_chance}(\text{Petr}, x)]$$

(b) *Assertion:  $\neg \forall x[\text{student}'(x) \rightarrow \text{give\_chance}(\text{Petr}, x)]$*

$$(c) \therefore \forall x[\text{student}'(x) \rightarrow \neg \text{give\_chance}(\text{Petr}, x)]$$

This section presented empirical support in favor of Homer's claim that presupposition computation is a necessary checking point for NPI licensing. As was demonstrated, the homogeneity presupposition is (even if presuppositional) harmless for NPI licensing because the truth conditions remain downward entailing even after incorporation into the meaning. Generally, the universal intervention effects present a case against the

reduction of all intervention effects to implicatures. Let us assume with the current standard literature (see Sauerland 2004, a.o.) that in negated sentences, universal quantifiers imply negation of their stronger scalar alternatives (existential quantifiers), as in a sentence like *It's not the case that Paul ate all of the eggs* (from Sauerland 2004, ex. [18]) which implies *Paul ate some of the eggs*. Both bare and specific universal NPs in negated sentences are expected to imply the un-negated, logically stronger existential statement; both should interfere with NPI licensing, as the downward entailing environment would be destroyed by such an implicature. But this is not the case, as shown by the contrast between ungrammatical (1) and grammatical (14). Consequently only the presuppositional explanation is a viable way to explain the difference between intervening bare universal NPs and non-intervening specific universal NPs.

## 2.2 Illustrative Case 2: Neg-raisers

In this section I will focus on another case where presuppositions break the licensing of NPIs. It is the case of cognitive factives, which even if negated, cannot license weak NPIs in their embedded clause, in case the cognitive factives bear a presupposition breaking up the downward entailing environment. A Czech example of such presuppositional cognitive factives is a verb like *vědět* “know.” In (18a) the NPI *sebemenší šanci* “even the slightest chance” is unlicensed because the presupposition  $\exists x[\textit{chance}'(x) \wedge \textit{has}'(\textit{Mary}, x)]$  stemming from the factive verb *vědět* “know” breaks the downward entailing environment. Unlike the indicative, (18b) with the subjunctive mood is acceptable because the subjunctive mood suspends the factivity presupposition of the verb.

- (18) (a) \*Petr neví, že Marie má sebemenší šanci na úspěch.  
 “Peter doesn’t know that Mary has the slightest chance to succeed.”
- (b) Petr neví, že by Marie měla sebemenší šanci na úspěch.  
 “Peter doesn’t know that Mary would have the slightest chance to succeed.”

Data somewhat similar to (18a) with respect to Slavic languages were first discussed in Boškovič and Gajewski (2009), who use it as evidence against the existence of neg-raising in Slavic languages. Boškovič and Gajewski claim that Slavic languages do not allow neg-raising; empirically they build on the ungrammaticality of strict NPIs in embedded clauses of *believe* type cognitive factives. Consider first the grammatical English sentence (19); the strict NPI *until tomorrow* is usually taken as proof of the semantic presence of negation in the embedded clause, since strict NPIs need clause-mate licensers. Intuitively, because (19) is paraphrasable as *John believed that Mary wouldn’t leave until tomorrow*, the negation scopes below the neg-raiser *believe*, and even strict NPIs conform to this intuition. Neg-raisers like *believe* contrast with verbs like *say*, which do not allow an inference of the form  $\neg F(p)$  entails  $F(\neg p)$ . *John didn’t*

*say that Mary would leave* does not entail *John said that Mary wouldn't leave*, and this is the reason why strict NPIs are not licensed in embedded clauses of non-neg-raising verbs.

(19) John didn't believe [Mary would leave [<sub>NPI</sub> until tomorrow]].

Boškovič and Gajewski correctly observe that the translation of (19) into various Slavic languages is ungrammatical (with Slavic counterparts of English strict NPIs [20–21], from Boškovič and Gajewski [24–25]).

(20) \*Ivan ne vjeruje [da ju je Marija posjetila najmanje dvije godine.]  
(Serbo-Croatian)

“Ivan does not believe that Mary has visited her in at least two years.”

(21) (a) \*Ivan ne veril, čto Marija uedet až do zavtrašnego dnja. (Russian)

(b) \*Jan nie wierzył, że Maria wyjedzie aż do jutra. (Polish)

(c) \*Ivan nije vjerovao da će Marija otići sve do sutra. (Serbo-Croatian)

(d) Az ne vjarvam/\*kazah če Meri ja e poseštavala pone ot dve godini.  
(Bulgarian)

(e) \*Jan nevěří, že Marie ji navštívila nejméně dva roky. (Czech)

(f) \*Janez ne verjame, da jo je Marija obiskala že najmanj dve leti. (Slovenian)

Based on examples like (20–21), Boškovič and Gajewski claim that Slavic languages lack neg-raising completely. Even while agreeing with the data in (20–21), I consider their analysis too bold: even if the strict NPIs are really ungrammatical in sentences like (20–21), this does not have to be caused by lack of neg-raising, as I will now argue. The first problem to notice is that even weak NPIs are ungrammatical under negated cognitive factives, as seen in (18) at the beginning of this section, so there seems to be no correlation between non-acceptability of weak/strict NPIs and their clause-mate negation, because weak NPIs can be licensed even from their superordinate clause.

Now let us look at the theoretical ingredients of Boškovič and Gajewski's approach to the alleged lack of neg-raising in Slavic languages. If we reconstruct (in a simplified manner) Boškovič and Gajewski's theory of (general) neg-raising, we can represent the steps in their reasoning as in (22). If *F* (a predicate like *believe*) is a neg-raising

predicate, it presupposes either the truth or falsity of its embedded clause (22b). This is the familiar homogeneity presupposition (all-or-nothing) introduced in the previous section. If we negate the neg-raising predicate, the homogeneity presupposition survives, as negation does not cancel presuppositions generally (22c). The assertion  $\neg F(p)$  and the homogeneity presupposition together entail  $F(\neg p)$  (22d). The abstract reasoning is demonstrated in (23).

(22) (a)  $F$  is a Neg-Raising Predicate

(b) Where  $p$  is a proposition,  $F(p)$  presupposes:  $F(p) \vee F(\neg p)$

(c)  $\neg F(p)$  also presupposes  $F(p) \vee F(\neg p)$ .

(d) Together the assertion  $\neg F(p)$  and the presupposition  $F(p) \vee F(\neg p)$  entail:  $F(\neg p)$

(23) (a) *believe* is a neg-raising predicate

(b) *John believes that Mary would leave* presupposes:

(i) *John believes that Mary would leave*  $\vee$ .

(ii) *John believes that Mary wouldn't leave*.

(c) *John doesn't believe that Mary would leave* presupposes the same as (23b)

(d) (i) assertion: *John doesn't believe that Mary would leave*.

(ii) presupposition: *John believes that Mary would leave*  $\vee$ .  
*John believes that Mary wouldn't leave*.

(iii) conclusion: *John believes that Mary wouldn't leave*.

This is a completely general mechanism of neg-raising, which is presented in Gajewski (2005) in much more detail and which I consider the best theory of neg-raising today. So what is wrong with Slavic languages that prevents them from neg-raising? According to Boškovič and Gajewski, the part of the reasoning in (22) that does not work in Slavic languages is the homogeneity presupposition in (22b), which according to them is tied to the presence of determiners (especially definite articles) in a language. They make the hypothesis in (24), a particularly strong cross-linguistic generalization that again relates the homogeneity presupposition to the (non-)existence of articles in a particular language.

(24) Languages without articles disallow neg-raising and those with articles allow it.

It is true that if (23b) would for any reason be missing in a language, then the language (if we believe in the semantic theory of neg-raising) should lack the neg-raising, since the presupposition is the critical point in the reasoning which leads to the low scope interpretation of the matrix negation. But as was shown in the previous section, and as explained in greater detail by Dočekal and Strachoňová (2014), the homogeneity presupposition in Slavic languages does exist, so Boškovič and Gajewski's reasoning is not sound. Moreover it is empirically wrong as well. I will discuss two types of empirical evidence which points to the existence of neg-raising in Slavic languages.

The first sort of evidence comes from so-called cyclic neg-raising, which is specific to some neg-raisers and distinguishes neg-raising from positive polarity items (PPI) analyses of certain wide-scope interpretations of predicates with respect to negation. Consider the minimal pair of sentences in (25) and (26). The first sentence allows an interpretation where the neg-raiser *chtít* “want” is interpreted over the matrix negation. Schematically,  $\neg F(G(p))$  is interpretable as  $F(G(\neg p))$ , where  $F$  is the neg-raiser *doporučovat* “advise” and  $G$  is the neg-raiser *chtít* “want.” Such an interpretation can be theoretically explained as the interplay of two homogeneity presuppositions which, when computed together with the assertion, lead to the low scope interpretation of the matrix negation. (26), on the other hand, lacks such an interpretation and probably allows only a wide scope interpretation of the negation  $\neg F(G(p))$ . As noted by Homer (2010, 211–14), this is a general mark of neg-raising predicates, where some of them (depending on their semantics) allow such cyclic projection of presuppositions (*want*), while others (*advise*, *think*) do not. I take the existence of cyclic neg-raising in (25) and its absence in (26) as an independent proof of the existence of neg-raising in Czech.

(25) Nedoporučuji ti, abys chtěl zůstat ve městě.

“I don’t advise you to want to stay in the town.”

*paraphrasable as*: “I advise you to want to not stay in the town”

(26) Nechci, abys mi doporučil zůstat ve městě.

“I don’t want from you to advise me to stay in the town.”

*not paraphrasable as*: “I want from you to advise me to not stay in the town.”

The next piece of empirical evidence showing the existence of neg-raising in Slavic languages comes from the licensing of NPIs. The following list in (27) presents classes and examples of neg-raisers (the list is taken from Gajewski [2005]). The *believe*-like predicates discussed by Boškovič and Gajewski are just one of the classes and, as I will explain further, are very problematic for testing neg-raising phenomena, as these predicates are presuppositional, something which can break the licensing of NPIs. If we

chose a non-presuppositional neg-raiser of the intention/volition class, the test should be more reliable, as presuppositions do not enter into the picture.

(27) The classes of Neg-Raisers

- (a) [OPINION] think, believe, expect, suppose, imagine, reckon
- (b) [PERCEPTION] seem, appear, look like, sound like, feel like
- (c) [PROBABILITY] be probable, be likely, figure to
- (d) [INTENTION/VOLITION] want, intend, choose, plan
- (e) [JUDGMENT/OBLIGATION] be supposed, ought, should, be desirable, advise

As expected, cross-linguistically, Czech, Polish, and Bulgarian in (28)–(30) exhibit licensing of strict NPIs similar to Czech *ani jeden* “not even one”:

(28) Nechci, abys vyhodil ani jednoho studenta.  
 want-1SG.NEG to turn-out-2.SG not-even one student  
 “I don’t want that you fail even one student.”

(29) Nie chcę, żebyś wyrzucił ani jednego studenta. [Polish]  
 “I don’t want that you fail even one student.”

(30) Ne iskam da izgoniš nito edin student. [Bulgarian]  
 “I don’t want that you fail even one student.”

The same holds for different classes of strict NPIs in Czech—whether *až do* “until” or *nejméně* “at least,” both types are licensed in the embedded clauses of a negated neg-raiser in (31).

(31) Nechci, aby sis vzala Karla až do Vánoc/nejméně dva roky.  
 want-1.SG.NEG to SE marry-1.SG Karel PART until Christmas/at least two years  
 “I don’t want that you marry Karel until Christmas/at least two years.”

The data in (28)–(30) and (31) show convincingly that there is neg-raising in Slavic languages. The real empirical question now is why some cognitive factives (*want*-like) in Slavic languages allow neg-raising, while others (*know*-like) lack it, and why in English it seems that both types are neg-raisers. Even lacking a complete answer to the question, I assume it is safe to correlate it with the factivity presupposition tied

to *know*-like predicates and its absence in *want*-like predicates. Let us assume that this factivity presupposition is integrated into the computation of the sentence meaning after the checking of NPIs in English, but before the checking of NPIs in Czech. This cross-linguistic difference in the timing of presuppositions and NPIs has already been observed in the first section, so generally it is not surprising to see such effects. But I have to leave for further research empirical confirmation of this hypothesis with respect to the timing of other classes' presuppositions/NPIs. Notice though (as an independent confirmation) that Czech seems to check NPIs sooner than English in many other cases, like presuppositions of manner/reason questions. While questions usually license NPIs, as in the English example (32), this is not the case in Czech (33). This is again explainable as a consequence of earlier inclusion of the presupposition (at least of the *why/how* sort) in Czech compared to English.

(32) Why/How did Mary say anything to Peter?

(33) \*Proč/Jak měla Marie sebemenší tušení o jeho zradě?

“Why/How did Mary have the slightest idea about his betrayal?”

Adopting this perspective leads us to expect that Slavic languages exhibit neg-raising in the semantic sense of the low scope interpretation of negation in simple cases like (34). This semantic low scope is the explanation of grammaticality of strict NPIs in examples (28)–(31).

(34) (a) Petr mě nechtěl zradit.

“Peter didn't want to betray me.”

(b) (i) *assertion*: It is not the case that Peter wanted to betray me.

(ii) *homogeneity presupposition*: Peter wanted to betray me or  
Peter wanted not to betray me.

(c) ∴ Peter wanted not to betray me.

Turning to sentences with universally quantified subjects negated with constituent negation like *ne každý* “not everyone,” notice first that there are two possible readings of such sentences; (35b) is an existential wide scope reading which results from neg-raising. Second, however, there is no neg-raising reading in (35c). This optionality of the homogeneity presupposition is discussed at length by Homer (2010) without any general conclusion. Let us focus on the existential wide scope reading, which is certainly a possible reading of (35) and which is further empirical evidence

supporting the existence of neg-raising in Slavic languages. This reading again comes from the homogeneity presupposition, this time projected universally; see Homer (2010) and Chemla (2009) for arguments supporting universal projection of presuppositions in the nuclear scope of negated universal quantifiers. So again, the low scope reading of negation comes from the interplay of the homogeneity presupposition (universally projected) and the assertion.

- (35) (a) Ne každý mě chtěl zradit.  
 “Not everyone wanted to betray me.”
- (b) *paraphrasable as*: There were some people who wanted not to betray me.
- (c) *paraphrasable as*: Not everyone wanted to betray me.
- (d) (i) *assertion*: It is not the case that everyone wanted to betray me.
- (ii) *projection of the presupposition*: For every x, either x wanted to betray me or x wanted not to betray me.
- (e) ∴ There is some x such that x wants not to betray me.

Summarizing this section, let us conclude that neg-raising in Slavic languages does exist. This is supported by three types of evidence: a) licensing of (at least some) strict NPIs by neg-raisers, b) cyclic neg-raising, and c) existential wide-scope readings. There is some variation in the licensing of strict NPIs by neg-raisers, however. This variation leads Boškovič and Gajewski to claim that Slavic languages completely lack neg-raising, but this conclusion is too strong. However, even if their conclusion is too quick, it seems to reveal interesting data for current theories of neg-raising. Neg-raising is a completely general mechanism present in all languages, but its detection via the licensing of strict NPIs is sometimes blurred by the factivity presuppositions of certain neg-raisers (especially of the *believe*-type). In some languages (English), the factivity presupposition does not interfere with the licensing of strict NPIs because it is integrated later than in other languages. In Slavic languages, the factivity presupposition is integrated before licensing of strict NPIs and consequently the factivity presupposition interferes with strict NPI licensing. For neg-raisers of the *want*-type this sort of presupposition does not arise, so the licensing of strict NPIs runs through smoothly.

### 3. Summary

In this article, I focused on two cases where presuppositions interact with the licensing of NPIs: homogeneity presuppositions triggered by the specific interpretation of one type of

universal NP, and another instance of the homogeneity presupposition demonstrated in low-scope readings of negation in neg-raising Slavic predicates. Both cases lend support to Homer's program and further extend it by showing another case of non-intervening presuppositions—non-intervening because the homogeneity presupposition maintains the downward-entailing character of the (negated) assertoric part. Moreover it was shown that the subjunctive mood can cancel even the intervening presupposition of cognitive factives, and that what was wrongly identified as lack of neg-raising (by Boškovič and Gajewski) is in fact another case of presupposition intervention.

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# Reduction and Elaboration in Czech Coordinate Structures: An Elicited Imitation Task

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**Abstract:** In this paper we would like to present the results of our research into the acquisition of Czech coordinate conjunction structures in children. We administered an elicited imitation task with 64 pre-schoolers (aged 3.1–6.0) whose mother tongue is Czech. Elaboration and reduction are two processes implied by the direct and indirect analyses of these types of structures, as analyzed, for example, by Lust (1977). The elaboration versus other types of structural deviation in agrammatical as well as grammatical sentences proved to be statistically significant with  $p < 0.05$  (T-test). It is also apparent that the older the children are, the less they elaborate (Spearman's correlation coefficient  $r = -0.2966$ ,  $p = 0.017$ ).

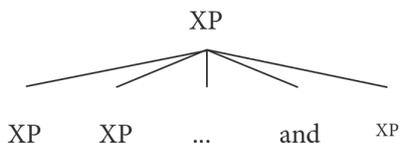
**Keywords:** language acquisition; elaboration; reduction; coordinate structures.

## 1. Coordination Structures in Theory

In this paper we are going to pay attention to one type of coordinate structure and that is “and-coordination” or conjunctive coordination (conjunction). This type of structure is often described in terms of elliptical or conjunction reduction processes by which we can state that there is an underlying abstract structure that is invisible in the surface patterns. The motivation for the ellipsis is economy. However, according to Haspelmath (2007, 38), there is “no agreement among linguists concerning the extent to which ellipsis should be assumed in coordinate constructions.” The author says that the derivational approach which connects all phrasal (monoclausal) coordinate constructions to their sentential (biclausal) counterparts and which was popular with the transformationalists a few decades ago does not seem to hold water any more. Haspelmath (2007)

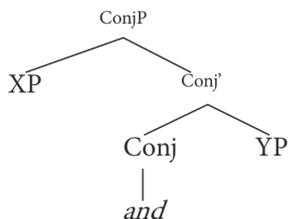
also mentions that the main motivation for the derivational or indirect approach is the desire to see coordination as uniformly sentential at the underlying level. This approach follows a long tradition of philosophical logic where the conjunction of propositions and not only terms is assumed (35).

Early syntactic treatments perceived coordinate structures as flat structures (multi- or non-headed); see Figure 1 below (Carston and Blakemore 2005, 353).



**Figure 1.** Flat structure.

More recent Chomskyan approaches offer the analysis of coordinate structures as a conjunction phrase with an asymmetric, single-headed structure of the X-bar schema. The conjunction *and* is the head of the phrase and the conjuncts occupy the specifier and complement positions (Carston and Blakemore 2005, 354), as depicted in Figure 2 below:



**Figure 2.** Conjunction Phrase.

There are still many unresolved questions, for example the question of symmetry and balance; for details see Haspelmath (2007).

We would like to focus in particular on the elliptical processes that are said to take place in at least some of the coordinate structures. Conjunction reduction processes (CR) include, according to Lechner (2004), Right-Node-Raising, Gapping, and Across-the-Board-Movement. However, we base our research on the work of Lust (1977, 23), who works with two deletion patterns which affect coordinate structures; see the examples below.

Forward deletion

- (1) *Babies laugh and babies cry.* (Sentential Conjunction)
- (2) *The teddy-bear walks and sleeps.* (Phrasal Conjunction)

Backward deletion

- (3) *Mommies jump and babies jump.* (Sentential Conjunction)  
 (4) *The kitties and the dogs hide.* (Phrasal Conjunction)

Structures (3) and (4) are particularly important for us as these are the structures that were used in our research.

## 2. Coordination Structures in Children's Language

*And* is the first connective to appear in children's English, according to Bowerman (1987, 287) in O'Grady (1997, 124) and the same is true for Czech (Pačesová 1979).<sup>1</sup> Sentence coordination is "one of the major hallmarks of syntactic development, marking the beginning of recursivity in the child's language" (Tager-Flusberg et al. 1981, 203). Children start to connect using the connector *and* early. Nevertheless, the structures in which it appears differ as to their complexity. That is why, when speaking about coordination, one needs to specify closely what structures one has in mind. The problem is not the connector but the properties of what is being connected. Tager-Flusberg et al. (1981) analyzed spontaneous speech and found out that the earliest coordinations were noun + noun phrases. These authors' main finding is that phrasal coordinations appear earlier than sentential ones. Lust (1977), on the other hand, says that children learn sentential coordinates first and their phrasal derivatives only later. What the authors do agree on is that children have greater difficulty with coordinate structures involving backward deletion and that backward phrasals are also less frequent in spoken production.

As to the possible relation between phrasal coordinate structures and their possible sentential counterparts, Lust (1977) mentions the results of two influential studies in the field of coordination structures. Slobin and Welsh (1973) (example [5]) and Beilin and Lust (1975) (example [6]) carried out experiments using elicited imitation with children of pre-school age. The children were asked to imitate or repeat coordinate structures and the data show two interesting tendencies:

- (5) *The red beads and the brown beads are here.*  
 Imitated as: *Brown beads here an' red beads here.*
- (6) *Give me the girls and give me the boys.*  
 Imitated as: *Give me the girls and (the) boys.*

Example (5) shows the process of elaboration when the child builds a structure that she or he did not hear. Example (6), on the other hand, shows an opposite reaction, as the

<sup>1</sup> More recent data on the acquisition of Czech as an L1 are offered by Saicová-Římalová (2013), which unfortunately was unavailable to us. For Slovak, see Kesselová (2008).

child reduces the structures even though she or he was asked to repeat a sentential structure. Thus phrasal structures seem to be elaborated, while sentential ones are reduced.

We have already mentioned that our test sentences involve backward deletion processes. What needs to be added is that we chose only subject coordination sentences. These also seem to be more difficult for children than other types, for example VP coordination; see, e.g., Ardery (1980) and Lust and Mervis (1980) in O'Grady (1997).

#### Subject coordination

*The tiger and the turtle pushed the dog.* = [The tiger \_\_\_\_] and [the turtle pushed the dog.] (\_\_\_\_ = pushed the dog)

#### VP Coordination

*The dog kissed the horse and pushed the tiger.* = [The dog kissed the horse] and [\_\_\_\_ pushed the tiger] (\_\_\_\_ = the dog)

O'Grady mentions, however, that there is no independent evidence of a gap in either of these sentences (1997, 127). Tager-Flusberg et al. (1981) offer the developmental route for coordination structures and suggest that children start off with well-formed phrasal coordination and it is only later that they start to form complete propositions and coordinate them. Eventually, they use deletion rules to derive phrasal coordinators from corresponding sentential forms. Deletion thus seems to be one of the last steps in the acquisition process.

### 3. Research on Czech

#### 3.1 Experimental Design and Methodology

There are no up-to-date studies concerning the acquisition of child Czech syntax available to us. We decided to use an elicited imitation task as this seems to be a solid start in getting acquainted with the properties of child syntax in quite an easy way with children of a very young age. An elicited imitation task is a widely debated type of task, though. Some researchers do not consider this method a valid way of investigating child syntax. Nevertheless, from the data available and from the literature it is apparent that children do not simply repeat. They analyze, interpret, and reconstruct while repeating. It thus does not seem to be a simplistic task that shows us no evidence. Quite the contrary, it may show us how the structures work in children's minds and whether they have been already acquired and how.

For our experiment we used the following set of constructions. The set includes six agrammatical constructions. The opinions on the issue of using agrammatical sentences in experiments differ. Lust et al. (1996) propose using grammatical constructions

only, while Chomsky (1964) is in favor of using agrammatical ones as well. Children usually have problems with imitating material they do not know and that is not part of their grammatical competence (Lust et al. 1987). We decided to use such constructions and see how children reacted and how they imitated them.

Furthermore, and more importantly, there are three grammatical phrasal constructions and three grammatical sentential constructions. As to the type of deletion processes, only backward deletion is included in the phrasal structures; we are thus working with the structure types SV + SV (phrasal grammatical), SV + SV (sentential grammatical), and SV + S\* (sentential agrammatical).<sup>2</sup>

### Phrasal (grammatically correct)

*Princezny a královny tancují.* (Princesses and queens dance.)

*Letadla a košťata letí.* (Aeroplanes and brooms fly.)

*Sloni a velbloudi spí.* (Elephants and camels sleep.)

### Sentential (grammatically correct)

*Jídla pálí a pití pálí.* (Meals are hot and drinks are hot.)

*Babičky vaří a maminky vaří.* (Grannies and mummies cook.)

*Řidiči pracují a učitelé pracují.* (Drivers and teachers work.)

### Agrammatical

\**Zebry běhají a žirafy.* (Zebras run and giraffes.)

\**Vlaky jedou a autobusy.* (Trains go and buses.)

\**Štěňata skáčou a koťata.* (Puppies jump and kittens.)

\**Velryby plavou a štiky.* (Whales swim and pike.)

\**Parky voní a lesy.* (Parks smell and forests.)

\**Auta svítí a kola.* (Cars light and bicycles.)

The set of sentences was accompanied by filler sentences to distract the attention of the children and prevent possible structural influences. Following the previous studies, we wanted to see whether there would be reduction and elaboration processes during children's imitation and consequently whether we could find the following types of structures in the Czech data.

- (a) *Mummies cook and grannies cook.*  $\Rightarrow$  *Mummies and grannies cook.* // *Mummies cook and grannies.* (REDUCTION)

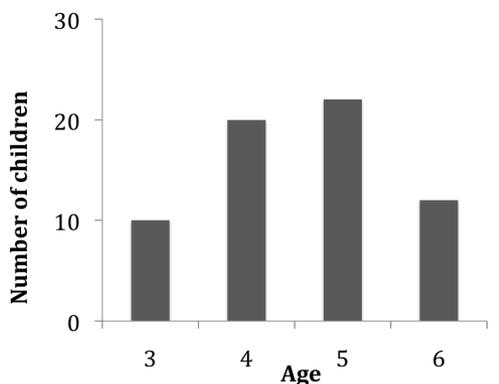
<sup>2</sup> Plural forms were used to make the data for children sound familiar and to avoid complications connected to gender differences in Czech.

(b) *Princesses and queens dance.*  $\Rightarrow$  *Princesses dance and queens dance.*  
(ELABORATION)

(c) *\*Cars go and buses.*  $\Rightarrow$  *Cars go and buses go.* (ELABORATION)

### 3.2 Subjects

The participants were 64 monolingual and typically developing children aged 3.1–6.0 (Figure 3, Table 1) whose mother tongue was Czech and who were all attending the kindergartens where the research took place.



**Figure 3.** Age distribution in children.

| Total number of children | Mean | Standard deviation | Standard error |
|--------------------------|------|--------------------|----------------|
| 64                       | 4.7  | 1.015              | 0.127          |

**Table 1.** Descriptive statistics of the ages of the children used for the research.

Each child was asked to repeat the sentences she or he heard. The sentences were read out loud by the researcher. First, the children were trained, so that we could be sure they understood the task. Then the task was administered. If the child needed the sentence to be repeated the researcher did so but only once, so the sentences were read a maximum of two times. There were also children who did not manage to take part in the imitation task and were not able to imitate the sentences during the training session or consistently during the task itself. These children were excluded from the research and from the statistical analysis. All the data were recorded, transcribed, and analyzed.

### 3.3 Results and Discussion

The transcribed data show a lot of information. Nevertheless, for the purposes of this article, we decided to analyze only data relevant for the topic of this article and

focus on the two strategies mentioned at the beginning of this article—elaboration and reduction. A sentence was incorrect if it was not imitated in exactly the same way. Other types of deviations included, for example, word order changes, ellipsis in a broad sense, lexical changes (affecting not only the nouns and verbs used in the structures but also the coordinator), and non-imitation (a child not being able to repeat the sentence) or a combination of these deviations. What still needs to be clarified is the status of reduction. It is apparent that children do tend to leave out elements from the structures being imitated and we have already mentioned reduction in the broad sense. When speaking of reduction, however, we mean reduction in the sense portrayed above—leaving out a particular element of the structure and that is, in this case, the verb from the first clause. No other types of deletion processes were counted as reduction and were treated as other types of other deviations.

Simple descriptive statistics show that there were 151 incorrectly repeated structures out of 768 repetitions (64 children  $\times$  12 sentences), which is 19.7%. There does not seem to be a major difference between grammatical and agrammatical sentences as to the number of deviations (incorrect repetitions). When imitating grammatical structures the children produced 78 deviations, with grammatical ones it was 73, that is, 51.7% vs. 48.3%. These results do not seem to conform to the usual findings that state that agrammatical structures represent structures that are more difficult and more liable to deviations; for a detailed and up-to-date discussion see Poliřenská (2011).

As to elaboration in our data, children almost never elaborate phrasal grammatical coordinate structures; see the only examples below (the identification code of the child + age [year, month] are given in the brackets):

*Sloni a velboudi spí.* → *Velbloudi spí a sloni spí.* (A22/3,1)  
(Elephants and camels sleep. → Camels sleep and elephants sleep.)

*Sloni a velboudi spí.* → *Sloni spí a velbloudi spí.* (C40/3,4)  
(Elephants and camels sleep. → Elephants sleep and camels sleep.)

The first example also includes deviation in word order. When looking at these two children's performances in more detail, one cannot see any particular strategy in elaboration. These are the only two examples where these two particular children elaborated on phrasal grammatical structures. Child C40/3,4 also elaborated on one of the agrammatical structures, and the same is true for child A22/3,1.<sup>3</sup>

3 Nevertheless, what needs to be stressed is the fact that age does not seem to be the key factor and proper language development level measurement (i.e., MLU) needs to be carried out. There were more three-year-olds tested and none of them elaborated on phrasal grammatical structures; for more on this issue, see the discussion below.

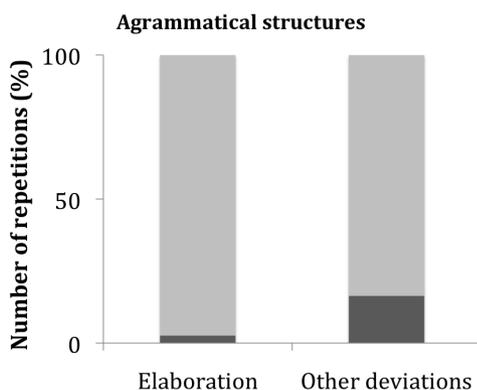
Evidently, children do elaborate within the agrammatical sentences; see the examples below. Because of the pre-testing, the children, however, knew that correction was not what they were asked to do.

*Zebry běhají a žirafy.* → *Zebry běhají a žirafy běhají.* (A12/4,2)  
(Zebras run and giraffes. → Zebras run and giraffes run.)

*Vlaky jedou a autobusy.* → *Vlaky jedou a autobusy jedou.* (C22/4,9)  
(Trains go and buses. → Trains go and buses go.)

As to the reduction, none of the sentential structures were reduced in the systematic way proposed by the theoretical background, thus creating a phrasal structure. The children generally seemed to reduce for processing and memory deficit reasons; for an extensive study of this issue see Polišenská (2011).

To be able to account for the complicated data statistically<sup>4</sup> we chose to use a parametrical T-test. The subjects' responses were scored according to the presence or the absence of elaboration/reduction. In this study we would like to present only two main results. First, the results show that the presence of elaboration versus other types of structural deviation in agrammatical as well as grammatical sentences proved to be statistically significant, with  $p < 0.05$ . Second, the older the children are, the less they elaborate (Spearman's correlation coefficient  $r = -0.2966$ ,  $p = 0.01$ ). Figures 4–7 show the distribution of elaboration vs. reduction in grammatical as well as agrammatical structures.



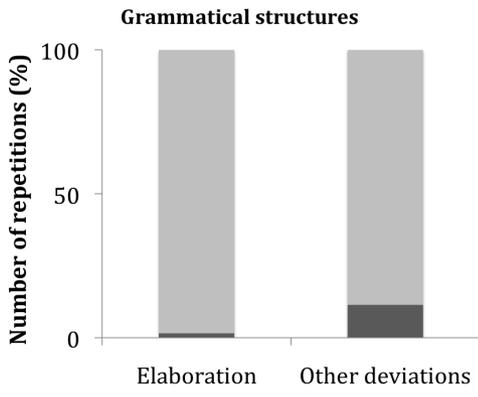
**Figure 4.** The chart represents the relative number of elaborations and other deviations in agrammatical structures. There is a statistically significant difference ( $p = 0.001$ )

<sup>4</sup> I would like to thank my sister Thuraya Awadová for her help and patience.

between the number of elaborations and other deviations from the total number of repetitions of agrammatical structures ( $n = 384$ ). The dark gray bars represent the relative number of sentences where the children elaborated or made other deviations, the light gray bars represent correctly repeated sentences.

| Agrammatical structures              | Number of sentences | Percentage (%) |
|--------------------------------------|---------------------|----------------|
| Elaborations                         | 10                  | 2.60           |
| Other deviations                     | 63                  | 16.4           |
| From the total number of repetitions | 384                 | 100            |

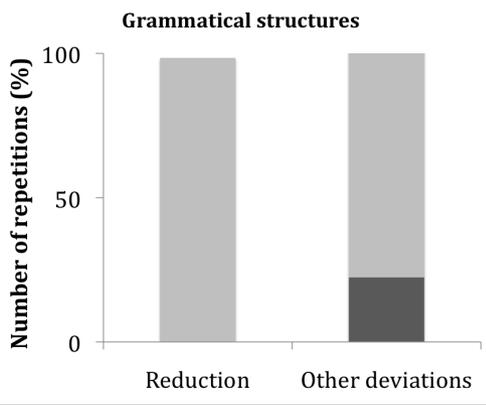
**Table 2.** The number and percentage of elaborations and other deviations in agrammatical structures.



**Figure 5.** The chart represents the relative number of elaborations and other deviations in grammatical structures. There is a statistically significant difference ( $p = 0.001$ ) between the number of elaborations and other deviations from the total number of repetitions of grammatical structures ( $n = 192$ ). The dark gray bars represent the relative number of sentences where the children elaborated or made other deviations, the light gray bars represent correctly repeated sentences.

| Grammatical structures               | Number of sentences | Percentage (%) |
|--------------------------------------|---------------------|----------------|
| Elaborations                         | 3                   | 1.56           |
| Other deviations                     | 22                  | 11.45          |
| From the total number of repetitions | 192                 | 100            |

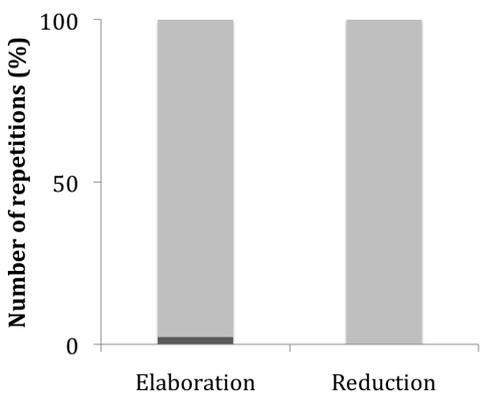
**Table 3.** The number and percentage of elaborations and other deviations in grammatical structures



**Figure 6.** The chart represents the relative number of reductions and other deviations in grammatical structures. There is a statistically significant difference ( $p = 0.001$ ) between the number of reductions and other deviations from the total number of repetitions ( $n = 192$ ). The dark gray bars represent the relative number of sentences where the children reduced or made other deviations, the light gray bars represent correctly repeated sentences.

| Grammatical structures               | Number of sentences | Percentage (%) |
|--------------------------------------|---------------------|----------------|
| Reductions                           | 0                   | 0              |
| Other deviations                     | 43                  | 22.39          |
| From the total number of repetitions | 192                 | 100            |

**Table 4.** The number and percentage of reductions and other deviations in grammatical structures.



**Figure 7.** The comparison of the incidence of elaborations and reductions in grammatical and agrammatical structures.

| Agrammatical structures              | Elaboration | Reduction |
|--------------------------------------|-------------|-----------|
| Number of sentences                  | 13          | 0         |
| From the total number of repetitions | 576         | 192       |
| Percentage (%)                       | 2.25        | 0         |

**Table 5.** The number and percentage of elaborations and reductions.

## 4. Conclusion

The main preliminary results of our study are that the children did not reduce a single sentence in the proposed way; the children did elaborate them in the proposed way, though, and they did elaborate much more within the agrammatical sentences than in the grammatical ones. Age seems to play an important role—the older the children are, the less they elaborate. There does not seem to be a significant difference in terms of the number of deviations between grammatical and agrammatical structures. There is, however, evidently a significant difference as to the status and type of deviations within these two types of structures.

Our results do not support Lust's (1977) thesis concerning the prior acquisition of sentential coordinate structures and they do not support the indirect analyses and consequently the derivational approach to phrasal structures. There were only two instances of the elaboration of phrasal (grammatical) structures and slightly more examples of elaboration within the agrammatical structures and the statistic analysis confirms that even these scarce instances are significant. The results do support Lust's (1977) findings, as well as those of Tager-Flusberg et al. (1981) concerning there being no evidence of reduction on backward sententials. The latter authors used the structure *A pig is playing a drum and a raccoon is playing a drum*, where both noun phrases are in the singular, while our sentences were all in the plural, and that is why it might be questionable if such a comparison may be made.

Even though our data concerning elaboration represent significant evidence, we need to exclude possible structural interference coming from the sentence structures, which may have influenced the children while they were imitating the phrasal ones. In our future research we would like to carry out the very same task with the very same set of sentences with children under the age of three as we think that if there is a difference in processing and imitating phrasal vs. sentential sentences we need to cover children of a very young age.

Every research method has its limits and to understand the data better we need to carry out more and different tasks as the varied methodology could give us better insights. We also need to exclude confounding factors, such as the length of the structure and lexical factors and other non-linguistic variables such as memory factors, motivation, and understanding of task requirements. Nevertheless, we regard

the elicited imitation method as being a very useful tool, which can serve and actually is widely used as a performance metric assessing language processing and language development. We hope to be able to contribute to a better understanding of how child Czech syntax works in itself and in relation to corresponding theoretical analyses.

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# Structure and Semantics behind the Non-Deletable Arguments of Morphologically Complex Transitive Verbs in Polish

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**Abstract:** Verbs in Polish may be prefixed, among others, with lexical prefixes and pure perfectivizers. The morpho-syntactic properties of these two classes of verbs differ and the goal of this paper is to explain the differences in the behavior of these verbs. The verbs prefixed with lexical prefixes, if transitive, require the presence of overt objects in their clauses, while the objects of transitive verbs with pure perfectivizers may surface as indefinite existential objects, which are not spelled out overtly. So far, the available analyses of parallel data, based on semantic frames, selection restrictions and structure-dependent distinctions, have failed to explain the difference in the behavior of the two groups of verbs. What may lie behind the differentiation is Filip's (2013) maximization operator of events ( $Max_E$ ), which requires that the information about an event be as full as possible at the stage level. The two classes of prefixes contain the operator as a part of their lexical information, but since they attach at two distinct levels of verbal constructions, the effects of the operation of  $Max_E$  differ. Another effect of the operation of  $Max_E$  may be seen when prefixed "clear" verbs acquire the ability to spell out all the possible participants in the event.

**Keywords:** zero objects; lexical prefixes; pure perfectivizers; Slavic aspect; "clear" verbs.

## 1. Introduction of the Data

The problem that we will study in this paper concerns the appearance or non-appearance of overt direct objects with unprefixed and prefixed verbs in Polish. The issue turns out to be of a non-pragmatic nature since hard and fast structural factors condition the distribution; certain prefixes require direct objects to be spelled out. We will offer an analysis with explanatory force for this state of affairs that proposes the existence of the  $MAX_E$  operator

(introduced by Filip [2013] as a perfective aspect marker), associated with such prefixes. Unprefixed verbs will not contain this operator and thus will be able to lose direct objects relatively easily.

At the outset we will introduce the relevant data. In Polish, transitive verbs appear without overt direct objects relatively easily, while their prefixed counterparts generally require their objects to be spelled out.<sup>1</sup> The data below illustrate this situation.<sup>2</sup> We have selected just four unprefixed verbs with their prefixed counterparts to illustrate an all-prevailing linguistic situation. The verbs are: *krzyczeć* “cry”—*wykrzyczeć*<sup>3</sup> “cry out,” *trąbić* “honk” vs. *roztrąbić* “trumpet out,” *grać* “play”—*odegrać* “play out,” and *czytać* “read”—*szytać* “correct.” NKJP lists the following possibilities:

- (1) Unprefixed transitive verbs without overt objects:
  - (a) **krzyczy** za Nim rozwścieczona tłuszcza  
“The angry mob shouts at him.”
  - (b) kierowcy innych aut **trąbili** i migali światłami  
“The drivers of other cars honked and flashed their lights.”
  - (c) Wszyscy zawodnicy, którzy **grali** jesienią zostają w klubie  
“All the players who played in the autumn have stayed at the club.”
  - (d) mieszkańcy Jaworzna **czytają** chętnie  
“The people who live in Jaworzno read eagerly.”

The verbs used in the examples above are essentially transitives. The evidence for this effect comes from the fact that they can be followed by overt objects (2),<sup>4</sup> they can be passivized (3) and their objects, surfacing as *pros*, show up in different structural positions in complex sentences (4)–(5).

- (2) Unprefixed transitive verbs with overt objects:
  - (a) wszyscy **krzyczeli słowa** do coveru rock and roll  
“Everybody shouted the words to the cover of a rock’n’roll number.”
  - (b) **trąbi sukces** władz  
“He proclaims the success of the authorities.”

1 Medová (2009) discusses a parallel body of data for Czech.

2 The data predominantly come from the *National Corpus of the Polish Language* (Przepiórkowski et al. 2012), which will be tagged as “NKJP” in this text.

3 The prefixes will be indicated in bold characters.

4 The relevant structures are indicated in bold characters.

- (c) **grał muzykę** zaczerpniętą z utworów Beatlesów  
 “He played music taken from the Beatles’ songs.”
- (d) Łukasz Broma, który miał **czytać list**  
 “Łukasz Broma, who was to read the letter”
- (3) Unprefixed transitive verbs in passive structures:
- (a) chce nagrać płytę na której wokół będzie na pół **krzyczany**  
 “He wants to record a record on which the vocal will be half-shouted.”
- (b) Od kiedy **trąbiony** jest co godzinę . . . nie wiadomo  
 “Since when it has been trumpeted every hour is not known.”
- (c) Spektakl **grany** jest w kostiumach  
 “The show is played in costumes.”
- (d) Tydzień temu w kościele był **czytany** list biskupa  
 “A week ago a bishop’s letter was read in church.”

Specific structures (4)–(5) show that the verbs are equipped with objects visible to morpho-syntax, and not just with semantic arguments, even in those cases where the objects are not overtly spelled out. These structures are complex sentences with *dać się* “allow oneself” and *wymagać* “require” in the matrix clauses. These clauses are complemented, respectively, with transitive verbs and their nominalizations whose objects perform the functions of subjects of the matrix clauses.<sup>5</sup>

- (4) (a) Hejnał<sub>i</sub>                      daje                      się                      grać pro<sub>i</sub>/trąbić pro<sub>i</sub>.  
 Bugle call-Nom.SG.    give-3rd SG.Pres.    self                      play/trumpet-INF.  
 “The bugle call can be played/trumpeted.”
- (b) Te słowa<sub>i</sub>                      dają                      się                      czytać pro<sub>i</sub>/krzyżeć pro<sub>i</sub>.  
 these word-NOM.PL.    give-3rd PL.Pres.    self                      read/cry-INF.  
 “These words can be read/shouted.”

<sup>5</sup> We will not go into the details of the syntactic analysis of those sentences as they are as yet poorly researched in Polish. We believe that they can be analyzed along the lines suggested by Landau (2010). The examples in (5) involve the phenomenon of co-construal. For our purposes it is important that the arguments—the overt subject and the implicit object—have to be identified with each other, and thus the latter has to be morpho-syntactically active.



## 2. Possible Factors Influencing the Occurrence of Overt Internal Arguments of Transitive Verbs

In this section we will recall some theories which may be harnessed to account for the distinction in the tolerance of zero objects in clauses with transitive verbs. We will consider the possibility that unprefixed verbs drop their objects in certain contexts that allow the anaphoric interpretation of these arguments, while prefixed verbs are immune to such conditioning. Then the selection restrictions associated with the two classes of verbs will be compared as a possible source of the differentiation. The semantic frames associated with particular classes of predicates will also be considered as possible factors and, finally, the structure-dependent contrasting behavior of the verbal classes will be analyzed within the decompositional possibilities of Distributed Morphology. However, none of these factors will be found to be satisfactory. Some will be shown not to work for Polish data, some will be refuted on the grounds that they do not supply an explanation, but could merely describe the data.

At the outset we will consider a broader context as a possible source of the distinction. If unprefixed verbs appear in a context which prompts the identity of their objects, the object can easily be dropped (see Fillmore 1986; Resnik 1993; 1996; Goldberg 2005; 2006; Ruppenhofer and Michaelis 2014). If prefixed verbs did not show the same kind of behavior, their object-retaining characteristics could be attributed to their imperviousness to the context. The examples in (7) below show that prefixed verbs also lose their objects in anaphoric contexts.

- (7) Prefixed verbs without overt arguments in anaphoric contexts:
- (a) Wgrywamy **WordPressa**, no, przynajmniej ja wgrałem  
“We upload **WordPress**, well, at least I have **uploaded** [it].”
  - (b) Dlaczego **podróż** z Katowic do Krakowa trwa długo, a do Warszawy dłużej niż można **wyczytać** w rozkładzie jazdy  
“Why does the **journey** from Katowice to Krakow last so long, and to Warsaw even longer than one may **read** in the timetable?”
  - (c) **To** będę mógł . . . zdjąć dopiero, jak **sczytam** spokojnie po naprawieniu reszty mankamentów  
“**This** I will be able to remove only when I have **proofread** [it] in peace after having corrected all the shortcomings.”

As prefixed verbs appear without objects in such utterances, just like the unprefixed ones, these factors cannot explain the overall distributional difference between the verb classes being analyzed.

Another promising line of research may be forthcoming when the selection restrictions of unprefixed and prefixed verbs are studied. Resnik (1996, 145–49) maintains

that the tighter the selection, the greater the possibility of deleting the internal argument. Logical though it seems, no such regularity can be observed for our body of data. Polish unprefixes verbs are general in meaning, while prefixes delimit particular narrow scopes of meanings for the predicates they attach to. For instance, *czytać* means “to read” and it selects anything readable (or it appears with a covert object), while its prefixed counterparts, which require the presence of overt objects, are much more choosy: *odczytać*, *rozczytać* “decipher” require a text which presents some difficulties in deciphering, *wczytać* “upload”—an uploadable piece of information, *sczytać* “proofread”—a text with presumed errors, etc. Clearly, selection restrictions are tighter in the case of prefixed verbs, so the correlation, if any, is opposite to that predicted.

Ruppenhofer and Michaelis (2014) attribute the ease/difficulty of dropping objects to the properties of the semantic frames in which particular verbs are located. This approach continues the line of reasoning originating with Fillmore (1970) and Rappaport Hovav and Levin (1998), where particular semantic classes of verbs represent particular argument frames. The problem with analyzing prefixed verbs along such lines is connected with the fact that the semantic frames to which the verbs belong are many, while their behavior is uniform. Whether we consider the distinction between, e.g., manner verbs vs. accomplishments (result) (see Levin 2012): *roztrąbić* “trumpet” vs. *rozjarzyć* “lighten,” or more specific distinctions (see Ruppenhofer and Michaelis, to appear), e.g., Separating frame *odmyć* “wash out,” *usunąć* “remove”; Partition frame: *rozparcelować* “divide into plots,” *odseparować* “separate”; Verdict frame: *odmierzyć* “apportion,” *rozsądzić* “judge”; Activity start frame: *rozwichrzyć* “make unruly,” *odpalić* “initiate,” etc. the verbal behavior is uniform: the verbs retain their objects. Such a line of analysis would obscure the generalization which underlies the data.

Explanations along structure-dependent lines, where verbal decomposition, as suggested by Svenonius (2004), Romanova (2007) or Ramchand (2008), justifies semantics and behavior in morpho-syntactic contexts, seem to be much more promising. Lexical prefixes (Svenonius 2004) express an extra projection headed by the prefix—the result predicate, following Svenonius’s terminology (see [8]). Consequently, in this approach the result predicate could require its complement (verbal direct object) to be overt. Thus our prefixed transitive verbs, as they are made up of result predicates (R) in their lowest projection, would have their objects spelled out. The unprefixes verbs would lack such a projection altogether and thus no predicate would introduce the obligatory complement.<sup>7</sup> The event projection would be the lowest one in their representation and consequently the predicate of events, with different properties from the predicate of results, need not require the obligatory realization of its complement (see [9]):

7 For possible structures of unprefixes verbs see, e.g., Copley and Harley (2014).



If we want to base the division of predicates into those of results and those of events on some semantic grounds, such predicates constitute a problem.

We think that the problem of the distinction in tolerance towards non-overt direct objects in Polish lacks an adequate explanation with the apparatus that has been proposed so far within the approaches compatible with Generative Grammar.

### 3. $Max_E$ as a Factor Conditioning the Overtiness of Objects

Filip (2013)<sup>9</sup> has proposed that in order to capture the identity of the perfective aspect in the languages of the world we should include an operator—a maximization operator of events—which imposes the Maximal Stage Requirement on semantic structures. In simple terms, the operator requires that the most complete information about a given event be construed. Filip (2013) sees this operator as a highly abstract entity, devoid of phonological content and not directly connected with any structure (at least not universally).

We would like to claim here that the presence of the operator is coded in particular morphological formatives and that one of the effects of its operation is expressing the maximization of the information of events as the overtiness requirement for direct arguments in the case of Polish prefixed verbs.

The operator proves to be useful, independently of the Polish data, as a constant feature of the perfective aspect in various languages. Filip observes that the scope of its operation and the various properties through which it is manifested differ worldwide, so in Polish  $Max_E$  could be associated with certain lexical prefixes. The manifestation (in our case the required presence of overt objects) could also be language-driven.

Below we will sketch some properties of this operator as we observe them in Polish (they may also hold for other Slavic languages<sup>10</sup>).

Lexical prefixes in Polish which require the presence of overt objects are found in the position of the heads of the Voice Projection (not low in the structure as proposed,

9 I would like to thank the reviewer of an earlier version of this paper for pointing out to me the discrepancies that exist between the solution advocated here and that in Filip (2008). I would like to stress that the idea that I have borrowed from Filip (2008; 2013) has served as an inspiration for the present solution and should be seen in this light. The concept of the maximization operator of events has undergone significant modifications in works by Filip herself. Originally, in Filip (2008), it is seen as a requirement securing the telicity of a given proposition. Then Filip (2013) argues that it is the perfective aspect, and not telicity, which shows affinity to the  $Max_E$  operator. Additionally, the actual placement of the operator is disputable and may vary depending on the language. While in Slavic languages it seems to be connected with perfectivizing prefixes (see Filip 2008, 218–19; 2013), in Germanic languages it must be connected with larger structural expansions, e.g., VP or a sentence. In my proposal I diverge significantly from Filip's original views, while preserving, however, the idea that Slavic prefixes are a site for the  $Max_E$ . Unlike her, I see the obligatory realization of objects with the verbs discussed in the text as a sign that the maximization operator of events is at work here. The details of my analysis do not correspond to Filip's views, as they correlate with the particular conception of verbal structures advocated in the present paper.

10 The system of Polish in the relevant aspects resembles, for instance, that of Czech—see, e.g., Malicka-Kleparska (forthcoming, b).

e.g., by Svenonius 2004). We base this claim on the observation that these prefixes have a causativizing power in Polish, i.e., they introduce the Causer<sup>11</sup> external argument (animate, inanimate or natural force participant bringing about a subordinate subevent)—see (10) below. They are also in complementary distribution with markers of the Middle Voice (Alexiadou and Doron 2012)—see (11)—so they do not turn up in synthetic anticausatives (see Malicka-Kleparska, forthcoming, a).

|                         |   |
|-------------------------|---|
| (10) Unaccusative verbs | Causative verbs                               |
| bieleć “whiten”         | <b>zabielić</b> “make white”                  |
| mrzeć “die”             | <b>umorzyć</b> “annihilate”                   |
| chudnąć “slim down”     | <b>wychudzić</b> “make thin”                  |
| tracić “lose”           | <b>wytracić</b> “exterminate”                 |
| świecić “give light”    | <b>rozświetlić</b> “lighten up” <sup>12</sup> |
| graniczyć “border”      | <b>rozgraniczyć</b> “draw a border”           |

(11) Synthetic anticausatives:

czerwienieć “redden”—\***roz**czerwienieć, \***zacz**czerwienieć, \***uc**zerwienieć, \***wy**czerwienieć,  
 grubieć “thicken”—\***roz**grubieć, \***zagr**ubieć, \***ogr**ubieć, \***ugr**ubieć, \***wy**grubieć  
 głupieć “grow silly”—\***roz**głupieć, \***zag**łupieć, \***wy**głupieć, \***ug**łupieć, \***nag**łupieć<sup>13</sup>

The telicity of such structures results from the  $Max_E$  brought in by the prefix and the place in the structure that the prefix occupies—the head of the Voice Phrase. A perfective interpretation follows automatically (see Łazarczyk 2010), as all the verbs in Polish which are prefixed within the scope of the Voice Phrase<sup>14</sup> are also interpreted as

11 Causer in the sense of Copley and Harley (2014).

12 Numbers of transitive verbs are formed from roots with the use of these prefixes. These verbs have corresponding adjectives and nominals, but no intransitive verbs. In such cases the prefixes also stand for the heads of the Voice Phrase, e.g., *napelnić* “fill up”—*pełny* “full,” *zatrudnić* “employ”—*trud* “effort,” *rozporządzić* “order around”—*porządek* “order,” etc., etc., and generate transitive verbs with obligatory overt objects. We are not able to present the details of such derivations here; suffice it to say that the suffixes which are also present in such verbs cannot be claimed to enforce the derivation by themselves as the relevant unprefixes do not exist: \**pełnić* “fill up,” \**trudnić* “employ,” \**porządzić* “order around,” etc. The suffixes constitute complex Voice heads together with the prefixes—see Malicka-Kleparska (forthcoming, c).

13 In the case of synthetic anticausatives some prefix combinations are allowed, but in those cases the prefix functions as a superlexical one. In Polish there is a great syncretism of prefixes belonging to the lexical, superlexical (see Svenonius 2004, 229–30) and pure perfectivizer classes (see Łazarczyk 2010). However, they differ in their morpho-syntactic behavior. Some such aspects will be discussed in Section 4.

14 In Łazarczyk’s (2010) analysis they head the Inner Aspect. As we see them as elements responsible for introducing the Causer argument and illicit in Middle Voice structures, we classify them as heads of the Voice Phrase.

perfective. Consequently,  $Max_E$  induces the perfective interpretation as in Filip (2013), but it also takes care of the overtness of objects.

#### 4. Problems with the Analysis Placing $Max_E$ in the Head of the Voice Phrase Position

The analysis we have presented so far steers clear of possible counterexamples. This would be accurate but for the fact that not all prefixes in Polish behave in the same way. Certain prefixes go together with unexpressed objects:

(12) Prefixed verbs with zero objects (NKJP)

- (a) ponieważ pasażer, idąc tam, wie, że tylko *zje* i wypije coś niealkoholowego  
 “Because the passenger, going there, knows that he can only **eat** and drink something non-alcoholic.”
- (b) Pani pismo jest – pani przyznaje – na tych drukach, które są w Sejmie. A poprzedniego pani nie wykonywała, tylko on sam. Tak. Pan minister powiedział, że już sobie napisał, ale właśnie teraz przy tych PITach ma takie skojarzenie, że jednak *źle napisał* i musi to zmienić.  
 “Your handwriting is—as you admit—on these documents, which are in the Sejm. But you did not prepare the previous one, but he himself did. Yes. The Minister said that he had already written, but just now with these PITs he realizes that he **wrote** [it] wrongly and he has to change it.
- (c) jeżeli to się stało we Francji, w Szwecji, w Hiszpanii, to wystarczy, że jakiś tam sąd rejonowy *napisze* i już mamy europejski nakaz aresztowania.  
 “If that happened in France, in Sweden, in Spain, it is enough that some regional court of justice **writes** and we already have a European warrant.”
- (d) Jeżeli wstawi mnie do składu, to *zagram* i powalczę o zwycięstwo  
 “If he selects me for the national team, then I will **play** and I will fight to win.”
- (e) Usadowiliśmy się w samochodach, doktor *zatrąbil* i wartburg poprowadził kawalkadę w stronę Polany.  
 “We sat ourselves in the cars, the doctor **honked** and the Wartburg led the cavalcade towards the clearing.”
- (f) Uczyla się, pracowała, ale potem trafiła na złe towarzystwo—opowiada Wanda Połczyńska, była dozorczyńni bloku.—Pewnie *wypila* i zostawiła Łukaszka  
 “She studied, worked, but then she fell in with some bad company—says Wanda Połczyńska, an ex-landlady.—She probably **drank** and left Łukaszek.”

The prefixes which behave in such a way belong to a group that Łazorczyk (2010) calls pure perfectivizers.<sup>15</sup> They also coincide to some extent with Svenonius's (2004, 229–30) superlexical prefixes, i.e. they mostly do not form secondary imperfectives:<sup>16</sup>

- (13) *zatrąbić* “honk” – \**zatrąbiać*/\**zatrąbiwać*,  
*zagrać* “play” – \**zagrywać*,<sup>17</sup>  
*przeczytać* “read” – \**przeczytywać*

Neither do they contribute meanings relating to location. However, they do not stack, e.g., \**za-roz-trąbić*, \**za-roz-grywać*, etc. Consequently, they cannot be identified with superlexical prefixes univocally.<sup>18</sup> These prefixes, like Voice Phrase heads, render the verbs to which they attach perfective (“temporarily bounded”—see Łazorczyk [2010]). This means that the time of the event described is within the reference time (see Reichenbach 1947). The clauses with such perfective predicates have the temporal inclusive interpretation, that is, the event takes place between the time limits, and it is not simultaneous with the limits (the activity could not extend beyond the limits):

- (14) Pomiędzy 10. a 12. Anna zagrała  
 “Between 10 and 12 Anna played.” (Inclusive interpretation)

When a clause with such a prefix interacts with other clauses, the events named in both clauses cannot have a simultaneous interpretation, only a consecutive one:

- (15) Anna zagrała i otworzyły się drzwi  
 “Anna played and the door opened.”

Other tests, based on the morphological system of Polish, also support the claim that the verbs formed by pure perfectivizers are perfective. E.g., perfective verb forms in the present tense refer to the future:

15 Extensive discussions devoted to such formatives and the general distinction between lexical prefixes and pure perfectivizers can be found, e.g., in Laskowski (1998), Młynarczyk (2004) and Bloch-Trojnar (2013), vs. Isačenko (1966) and Czochrański (1972), who do not recognize such a distinction.

16 There are exceptions, though: e.g., *zjeść* “eat up”—*zjadać* “eat, imperfective.” Łazorczyk (2010), however, analyzes such forms not as secondary imperfectives but as habitual formations.

17 The verb *zagrywać* exists in Polish, but with a different meaning: “serve.”

18 A more detailed comparison with Svenonius's (2004) categorization cannot be conducted within the limits of this work. What we want to stress, however, is the fact that other characteristics of these prefixes also make them “special.”

- (16) Anna zagra  
 “Anna will play”<sup>19</sup>

As example (16) shows, such future reference is the only possibility where pure perfectivizers are involved.

Although the verbs with pure perfectivizers are perfective, we want to claim that they are not telic of themselves: the telicity of the clauses in which they are situated may result from adverbs occurring there and other structural factors. The lack of telicity, understood as a lack of completion, can be observed if we insert an adverbial phrase that suggests a lack of completion, and yet the sentence is returned as grammatical:

- (17) Ania zjadła, ale nie do końca  
 “Ania has eaten, but not everything.”

A similar sentence with one of the lexical prefixes discussed in Section 3, and thus with the obligatory object, sounds odd:

- (18) ?Ania roztrąbiła wiadomość, ale nie do końca  
 “Anna spread the news, but not completely.”

We assume that the telicity in structures with pure perfectivizers results from contextual considerations as it is not of the same type as with the other class of prefixes.

It remains to be explained what the relationship of the  $Max_E$  operator and the aspectual projection might be. The behavior of lexical and pure perfectivizer prefixes suggests that both classes contain a  $Max_E$  requirement in their lexical descriptions. However, lexical prefixes, as heads of the Voice Projection, realize the maximal stage information requirement both as “temporal boundedness” and as the overtiness of their objects. Pure perfectivizers are introduced in a higher projection—the Viewpoint Aspect (see Łazorczyk 2010). They also contain  $Max_E$  in their lexical description.<sup>20</sup> Nevertheless, because they are introduced higher up in the structure, over the Voice Phrase, they cannot penetrate into the closed phase. The operator is visible merely as a perfectivizer and does not require the object of the verb to be spelled out.

## 5. Excursus into Other Uses of $Max_E$ in Polish

$Max_E$  may be visible in other areas of Polish morpho-syntax and not only as a factor forcing the appearance of overt objects with specifically prefixed transitive verbs. Here

19 Łazorczyk (2010) gives a number of tests for perfectivity, which we cannot quote here because of space limitations.

20 Filip’s (2013) analysis suggests that it would be a common feature of all perfective utterances.

we will sketch another possible area where it is at work. The group of verbs that we will introduce are the so-called “clear verbs.”<sup>21</sup> The verbs are characterized semantically by a meaning which codes the removing of some substance from some surface, as well as by an interesting alternation which allows their complements to exchange places and modes of realization without a change of meaning: one complement is a DP in the accusative case, the other a PP. They may each express, indiscriminately, either substance or location. They stand for a substance removed and the location from which it is removed, and may be freely realized either as direct or prepositional objects, while the meaning of the predication remains the same:

(19) Alternating “clear” verbs: *czyścić* “clean”

(a) Wyczyścił brud z dywanu

“He cleaned dirt from the carpet.”

(b) Wyczyścił dywan z brudu

“He cleaned the carpet of dirt.”

In Polish, however, some clear verbs allow only one of the possible configurations and the configuration depends on the particular verbal root, while in other words it is lexically determined:

(20) Non-alternating “clear” verbs: *łamać* “break” (a), *leczyć* “cure” (b)

(a) **Łamię gałązkę z** rosnącego przy drodze **bzu**.

“I am breaking off a twig from a lilac bush growing near the road.”

\***Łamię** rosnący przy drodze **bez z gałązki**.

\*“I am breaking a lilac bush growing near the road of a twig.”

(b) Ja nie ośmieliłbym się **leczyć kogoś z depresji**.

“I would not dare to treat anybody for depression.”

\*Ja nie ośmieliłbym się **leczyć depresję z kogoś**.

\*“I would not dare to treat depression from anybody.”

However, when some “clear” verbs are prefixed with lexical prefixes they acquire the potential for the complements to alternate, as in (19):

21 See Rappaport Hovav and Levin (1998), Levin (2006) for English, Segal and Landau (2012) for Hebrew, Alexiadou and Anagnostopoulou (2012) for Greek and Malicka-Kleparska (2013) for Polish.

- (21) (a) **wytrzepać** “beat, shake”  
 Wytrzepał słomę z butów  
 “He shook out straw from his shoes.”  
 wytrzepać kurz z dywanu “to beat a carpet free of dust” vs. trzepać buty (location) “shake shoes”/\*trzepać słomę (stuff)
- (b) **oblizać** “lick”  
 oblizać loda z palców “to lick ice cream off one’s fingers”  
 oblizać palce z lodów “to lick one’s fingers clean of ice cream” vs. lizać lody (stuff)/\*lizać palce (location)

In the case of the prefixed verbs in (21) the same  $Max_E$  may be at work: the maximization of the information requires that all the arguments associated (potentially) with a given event can be realized with a prefixed verb. This, of course, is an issue which requires a much more thorough study, but it might be another case where  $Max_E$  associated with lexical prefixes is visible.

## 6. Conclusion

The maximization of the information available in the event part of a syntactic structure as a result of the presence of the postulated  $Max_E$  operator in the lexical entries of the relevant prefixes in Polish allows both the explanation of the perfective nature of the verbs formed with all prefixes and also the obligatory presence of the objects with these prefixes which are introduced low enough to exert their influence on the event structure. Some other argument alternations could also be accounted for in this way, as is illustrated by the case of “clear” verbs in Polish. Seeing such morpho-syntactic phenomena as the satisfaction of the Maximal Stage Requirement can be seen as a step towards a true understanding of how morpho-syntactic alternations can be driven.

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# A Third Type of Adjective Modification? Evidence for DP in Serbo-Croatian

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**Abstract:** In this paper I argue that, in addition to Cinque’s (2010) direct and indirect modification, there is also a third type of adjective modification, analyzed higher, at the left periphery of DP. A closed set of Serbo-Croatian (S-C) adjectives (such as *pomenuti/navedeni* “mentioned” and *izvesni/određeni* “certain”), after being merged as indirect modification adjectives, move to a structural position, where they value d-features, providing the co-locutor with information about the referential (*pomenuti/navedeni* “mentioned”) or epistemic (*izvesni/određeni* “certain”) aspects of the denotation of an expression. These adjectives always precede other adjectives, including superlatives and comparatives, and they must bear the long, so-called “definite aspect” form. Moreover, they can serve as a barrier for left-branch and adjunct extraction in their referential/epistemic reading. Finally, these adjectives can precede short-form adjectives, a fact not previously discussed in the literature. It is concluded that there is a functional projection above S-C NPs that is sensitive to discourse properties.

**Keywords:** Serbo-Croatian; DP hypothesis; adjective modification; *mentioned*; *certain*.

## 1. The Objective

A lot of ink has been spilled in the discussion about the appropriate structure for analyzing Serbo-Croatian (S-C) nominal expressions, but there is still no consensus on whether applying a DP-model to a language with no articles (as the case is with S-C) is *déplacé* and merely an urge for unified structure, or a choice based on empirical facts. In this paper I argue that the S-C adjectives *pomenuti/navedeni* “mentioned” and *izvesni/određeni* “certain” offer evidence that there is a functional projection above S-C noun

phrases (NP) sensitive to discourse properties, i.e., that S-C does project some kind of DP. I will show that the analyzed adjectives are merged as Cinque's (2010) indirect modification adjectives, and that they subsequently move to a higher functional projection where they get a referential/epistemic reading, behaving like definite/specific markers. To be more precise, at this higher structural position these adjectives value d-features, providing the interlocutor with information about the referential (*pomenuti/navedeni* "mentioned") or epistemic (*izvesni/određeni* "certain") aspects of the denotation of an expression. Thus, the lexical semantics of these adjectives is interpreted at a more abstract level of the discourse, setting the features of the referential and epistemic dimension. The adjectives *pomenuti/navedeni* "mentioned" specify that the nominal expression finds a referent in the hearer's discourse domain [prox:+<sub>2nd</sub>], while *izvesni/određeni* "certain" specifies that the nominal expression does not find a referent in the speaker's epistemic domain [epist:-<sub>1st</sub>].

Two main facts strongly suggest that there is a separate maximal projection above S-C NPs hosting these adjectives. First, one can combine certain antonym adjectives in acceptable, pseudo-oxymoronic phrases like (1), showing us that the higher-positioned adjective is interpreted at the level of discourse, modifying the referent of the NP, while the lower antonym is modifying the reference, being interpreted at the proposition level. This allows for combinations like:

- (1) (a) **pomenuti** (**na sastanku**) **nepomenut** vojni pilot  
 mentioned on meeting not mentioned military pilot  
 "the previously mentioned military pilot not mentioned (at the meeting)"
- (b) **izvesni** **neizvestan** međunarodni projekat  
 certain uncertain international project  
 "a particular uncertain international project"
- (c) **nepoznati** **poznati** pevač  
 unknown known singer  
 "an unknown famous singer"

In (1a) the first adjective (*pomenuti* "mentioned") is marking that the referent of the expression is already introduced at the current stage of conversation (Heim 2002), while the second one is its antonym, which is negating the results of the event denoted by the deverbal adjective—the military pilot was not mentioned at the denoted meeting—which means that it is not disaffirming the discourse-old status of the referent. In (1b) the first, presumably higher-positioned adjective (*izvesni* "certain") is providing information on the certainty of the referent at the level of discourse (which epistemic specificity seems to present at a more abstract level), while the second, lower one

carries the “literal,” descriptive meaning that modifies the reference, telling us that the execution of the denoted international project is not certain. Finally, in (1c) the first adjective (*nepoznati* “unknown”) is signaling that the referent of the NP is unknown to the interlocutors, while the second one is contributing to the reference description, making it an element of the set of well known, famous singers.

The second piece of evidence that these adjectives should be analyzed in some type of DP is the blocking effect that they produce on left branch (LBE) and adjunct extraction (AE), just like regular determiners in languages with articles. It is a well-known, rather convincing argument of Zlatić (1997), Bošković (2008), and other proponents of Corver’s (1990; 1993) DP-parameter that only languages without articles allow LBE and AE, while the same syntactic movements in English are blocked by the saturated determiner projection. Nevertheless, in S-C the adjectives *pomenuti/izvesni* in their referential/epistemic interpretation prohibit LBE and AE over the DP they seem to occupy:

- (2) \*Skupa<sub>i</sub> je video [pomenuta / izvesna t<sub>i</sub> kola]. (S-C)  
 expensive is seen mentioned certain car  
 “It is the mentioned / a certain expensive car that he saw.”
- (3) \*Iz kojeg grada<sub>i</sub> je Ivan sreo [pomenute / izvesne devojke t<sub>i</sub>]?  
 from which city is Ivan met mentioned certain girls  
 “Ivan met the mentioned / certain girls from which city?”

Veselovská (1995) shows that only initial premodifiers can be extracted in Czech. This is in line with the situation in S-C. Contrastive and neutral topic/focus is projected above NP, where it attracts movement of the appropriate adjective to initial position. After the appropriate movement, the rest of the expression is backgrounded and can be elided. In (2) and (3) we see that the functional projection where the analyzed adjectives are hosted disallows LBE and AE, exposing a structural property witnessed with DPs. At the same time, these adjectives value d-features, behaving like definiteness (*mentioned*) or specificity (*certain*) markers. Moreover, the adjectives *pomenuti/navedeni* “mentioned” and *izvesni/određeni* “certain” in their referential/epistemic reading

- always precede other adjectives,
- always precede superlatives and comparatives,
- prefer the long-adjective form (so-called definite adjectival aspect), and
- can regularly precede short adjectives (indefinite adjectival aspect),

all of which are facts not discussed in previous literature.

We will conclude that some adjectives in languages with articles go through a similar lexicalization process, as the case is with the so-called post-determiners (as termed by Breban and Davidse [2003]), but that this is somewhat syntactically and semantically limited in the presence of an obligatory determiner. Unlike in S-C, these lexicalizations after the postulated movement of the adjective to DP are more frequent (a list of adjectives will be presented in Section 4). This brings up the main idea of the paper—to argue for a distinct, third type of adjective modification (in addition to Cinque’s [2010] direct and indirect adjective modification), located high at the left periphery of the nominal expression, where a closed set of adjectives provide different information about the referent at the abstract level of discourse.

The outline of the paper is as follows. In Section 2 we will discuss the semantics and syntax of S-C long and short adjectives, Cinque’s (2010) direct and indirect type of modification, as well as some basic issues regarding the “NP or DP wrangle.” Section 3 presents novel empirical data about the adjectives *pomenuti/navedeni* “mentioned” and *izvesni/određeni* “certain.” In Section 4 I will argue in favor of a DP analysis of the presented corpus examples and for a third type of adjective modification at the left periphery of the nominal expression, which modifies the referent but not the reference of the entire phrase. Section 5 concludes.

## 2. The S-C Long/Short Adjectives and the “NP or DP” Problem

In this section we will first take a closer look at the contrast between S-C long (LAF) and short adjective forms (SAF), as analyzed in previous literature (Subsection 2.1). In Subsection 2.2 I will introduce Cinque’s (2010) direct and indirect modification adjectives, relating them to the two forms in S-C. Finally, in Section 2.3 I will briefly sketch opposing views in the discussion about the proper model for analyzing S-C NPs.

### 2.1 LAFs and SAFs in Slavic

The study of S-C LAFs and SAFs has a two centuries long tradition, coming from Vuk Karadžić’s (1814; 1824) grammars of Vuk’s native Tršić area vernacular. LAF, traditionally termed “definite adjectival aspect” (*određeni pridevski vid*), has a marked suffix *-i* in the nominative masculine singular (4a), which is absent in SAF, the indefinite adjectival aspect (*neodređeni pridevski vid*) (4b). Paraphrased into modern linguistic terms, Karadžić (1814; 1824) relates LAF to definite descriptions (Christophersen 1939; Heim 2002), while SAFs tend to appear in indefinite contexts.

- (4) (a) pošten-i      čovek,    zlatn-i      prsten    (S-C)  
          honest-LAF   man      golden-LAF   ring  
          “the honest man”      “the golden ring”

- (b) pošten            čovek,    zlatan            prsten  
       honest-SAF    man        golden-SAF    ring  
       “an honest man”        “a golden ring”

Karadžić (1824) remarks that LAF contributes to the identification of the nominal referent, likewise the definite article in German, while SAF denotes a property of a nominal referent previously not introduced to the discourse.

Maretić (1899) (and later Belić [1999]) was the first to problematize the semantics of the two forms, noticing that LAF can signal that the denoted property is distributed exclusively to the referent of the modified expression in the physical/linguistic context, an idea close to Russell’s (1905) definition of the definite article. Actually, SAFs seem to bring a presupposition that there is more than one referent bearing the property denoted by the adjective in the appropriate discourse domain, while LAFs are regularly ambiguous in interpretation; thus the uniqueness presupposition can be cancelled (Stanković 2014b), cf. (5)–(6) in a scenario where the interlocutor has no previous information about any paper(s) to be denoted:

- (5) Donesi mi iz prve fioke **prazan** **papir**.  
       bring me from first drawer empty-SAF paper  
       “Bring me blank paper from the first drawer.”  
       »“There is more than one piece of blank paper in the first drawer.”  
       »»“There is only one piece of blank paper in the first drawer.”
- (6) Donesi mi iz prve fioke **prazn-i** **papir**.  
       bring me from first drawer empty-LAF paper  
       “Bring me a/the blank (piece of) paper from the first drawer.”  
       »“There is more than one piece of blank paper in the first drawer.”  
       »»“There is only one piece of blank paper in the first drawer.”

Maretić (1899) observes the fact that LAFs are mostly adnominal and attributive in function, while SAFs can be found in attributive and predicative position:

- (7) Lep /                    lep-i                    čovek            ulazi.  
       handsome-SAF        handsome-LAF        man            enters  
       “A/The handsome man is entering.”
- (8) Čovek    je    lep /                    \*lep-i.  
       Man     is    handsome-SAF        handsome-LAF  
       “A/The man is handsome.”

Maretić (1899) points out that in certain environments SAFs can be replaced by adverbs. The phenomenon actually represents the distinction between stage-level (S-) properties expressed by depictives, marked by SAFs in S-C (9), and individual level (I-) properties of adnominal modifiers. LAFs are once again semantically non-marked and open for both S- and I-level readings (10):

- (9) Srdit Marko jezdi niz Kosovo. (Maretić 1899, 455)  
 angry-SAF Marko rides through Kosovo  
 “Marko is riding through Kosovo angry.” (S-I)  
 #“Marko is an angry person and he’s riding through Kosovo.”
- (10) Srdit-i Marko jezdi niz Kosovo. (ambiguous)  
 angry-LAF Marko rides through Kosovo  
 “Marko is riding thru Kosovo angry’.” (S-I)  
 “Marko is an angry person and he’s riding through Kosovo.” (I-I)

Later scholars, like Stevanović (1986), argue that the adjective aspect is marking the referential status of the modified noun and not the discourse-status of the denoted property or its distribution to referents in the context.

For the last three decades of formal research on Slavic languages, the contrast between LAFs and SAFs has been explained on the basis of definiteness (Zlatić 1997; Progovac 1998; Rutkowsky and Progovac 2005; Despić 2013), epistemic specificity (Trenkić 2004), partitive specificity (Aljović 2002), and direct/indirect modification (Cinque 2010). Leko (1999) draws a parallel between LAFs/SAFs and restrictive/non-restrictive modification: LAFs are usually found pre-nominally and are restrictive, which means that they are directly responsible for the identification of the modified noun referent<sup>1</sup> (11), while SAFs can often be found post-nominally, with appositive intonation and a non-restrictive interpretation (12).

- (11) (a) lijep-i momak  
 handsome-LAF guy  
 “a/the handsome guy”
- (b) \*momak lijep-i  
 guy handsome-LAF

<sup>1</sup> Leko (1999) rejects postnominal LAFs, although many contexts (like vocatives *ženo luda!* “you crazy woman!”) allow for postnominal modifying LAFs.

- (12) (a) momak, lijep i pametan  
 guy handsome-SAF and smart-SAF  
 “a/the guy, him being handsome and smart”
- (b) \*momak, lijep-i i pametn-i  
 guy handsome-LAF and smart-LAF

In Leko’s (1992) intuition, both adjective forms can be combined in a single phrase, with SAFs always preceding LAFs:

- (13) (a) siromašan bolesn-i dječak  
 poor-SAF sick-LAF boy  
 “a poor sick boy”
- (b) \*siromašn-i bolestan dječak (Leko 1992, 622)  
 poor-LAF sick-SAF boy
- (c) SAF + LAF
- (d) \*LAF + SAF

Trenkić (2004) makes an assessment that the system of two adjectival declensions is “falling into almost complete disuse” (Trenkić 2004, 1405). Still, she points out that the aspect distinction is marking specificity, and not the definiteness status of the referent. As she comments, the crucial difference that separates definite from specific is to whom something is identifiable: to both the speaker and the hearer (definite), or to just the speaker (specific). Her statements are based on tests with the following scenario: a person goes into a room that he has never been into before, with the task to describe what he sees to someone who is outside the room and who has also never been in the room before. In S-C, this person would regularly use LAFs, contrary to expectation, as we are clearly dealing with an indefinite environment:

- (14) Kad uđeš u sobu na sredini je veliki okrugli sto.  
 When enter in room on middle is big-LAF round-LAF table  
 “As you enter, there is a big, round table in the middle of the room.”

Aljović (2002) has brought attention to another category possibly correlated with the LAF/SAF distinction, namely partitive specificity. The author argues that LAFs exhibit some characteristics similar to the Turkish accusative noun marker, present only in partitive specific contexts (Enç 1991). LAFs have a presuppositional reading, just like

Milsark's (1974) strong determiners—there is a contextually pre-established set of referents, and the modified referent is an element of this pre-supposed set (16). On the other hand, SAFs only have the existential reading, with no presupposition involved (15).

(15) Svaki profesor je sreo jednog vrijédnog studenta  
 every professor is met one diligent-SAF student

(16) Svaki profesor je sreo jednog vrijédnog studenta  
 every professor is met one diligent-LAF student  
 "Every professor met some diligent student or other."  
 "Every professor met one of the diligent students."

Table 1 sums up the facts presented in this subsection. In the linguistic literature LAFs have been analyzed as a marker of definiteness, uniqueness, epistemic specificity, and partitive specificity, as well as a form ambiguous between I- and S-level interpretation, while SAFs usually appear in indefinite, non-unique, and non-specific contexts, marking S-level properties of the modified noun.

|                       | LAF <sub>DMA</sub> | SAF <sub>IMA</sub> |
|-----------------------|--------------------|--------------------|
| Definiteness          | +                  | –                  |
| Uniqueness            | +/-                | –                  |
| Epistemic specificity | +                  | –                  |
| Partitive specificity | +                  | –                  |
| I-level               | +/-                | –                  |

**Table 1.** Semantics of LAF and SAF.

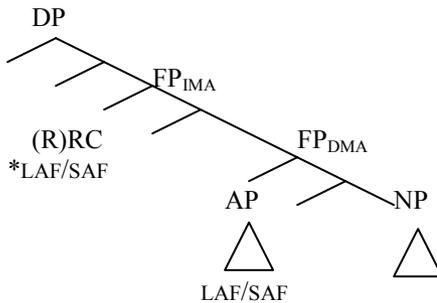
In the following subsection we will present Cinque's (2010) direct and indirect adjective modifications, paired with LAF and SAF respectively.

## 2.2 Cinque's (2010) Two Adjective Modifications

Cinque (2010) argues that adjectives are generated at two different syntactic positions below the projection hosting cardinal numbers, NumP.<sup>2</sup> Direct modification adjectives (DMA) are merged as adjective phrases (AP) in specifiers of functional heads, while indirect modification adjectives (IMA) are merged higher in a distinct projection hosting the predicate of a reduced relative clause (17).

<sup>2</sup> Cinque (2010) notices that the adjectives *unknown* and *wrong* can also appear in pre-cardinal position. Marušić and Žaucer (2013) offer a much longer list of pre-numeral adjectives, arguing for another pair of indirect and direct modification projections above the numeral.

(17)



The postulated syntactic difference is responsible for a whole series of contrasted readings ascertained in Romance, Germanic, and other corpora:

- I-level vs. S-level reading;
- restrictive vs. non-restrictive reading (with universal quantifiers);
- intersective vs. non-intersective reading;
- specific vs. non-specific reading;
- implicit relative clause vs. modal reading;
- idiomatic vs. literal reading;
- generic vs. non-generic (deictic) reading.

Cinque (2010) shows that SAFs are merged as IMAs, in the predicate of a reduced relative clause. They can appear both adnominally and in the predicate, while LAFs are generated as strictly adnominal DMAs, as shown in (17). Also, LAFs can give rise to non-intersective (idiomatic) collocations (18a), unlike SAFs (18b).

(18) (a) slijep-i            miš  
 blind-LAF            mouse  
 “a bat” / “blind mouse”

(b) slijep            miš  
 blind-SAF            mouse  
 “blind mouse”

LAFs do not have an absolutely rigid order among each other, only a preferred one. They thus appear to be like prenominal adjectives in English, which are ambiguous between IMAs and DMAs, and have a preferred but not an absolutely rigid order. Finally, in the context of universal quantifiers like *sav* “all” or *svaki* “every,” SAFs have a restrictive interpretation. These findings are given in Table 2:

|                       | LAF <sub>DMA</sub> | SAF <sub>IMA</sub> |
|-----------------------|--------------------|--------------------|
| Definiteness          | +                  | –                  |
| Uniqueness            | +/-                | –                  |
| Epistemic specificity | +                  | –                  |
| Partitive specificity | +                  | –                  |
| I-level               | +/-                | –                  |
| Restrictive (quant.)  | +/-                | +                  |
| Idiomatic             | +/-                | –                  |
| Intersective          | +/-                | –                  |

**Table 2.** Semantics of LAF and SAF.

In Section 3 and 4 we will show that a certain closed set of SAFs, merged as IMAs, move to the assumed DP, where they are interpreted at the level of discourse. But before that, in Subsection 2.3 we will take a brief look at the discussion about the adequate structure for S-C NPs.

### 2.3 DP, or “Bare” NP?

One of the open questions in Slavic linguistics is the issue of the appropriate model for interpreting NPs, given the fact that most of these languages lack the category of definite/indefinite articles, which are present only in Macedonian and Bulgarian. Is there a need for projecting a DP in an article-less language (19), or is the syntax of S-C nominal expressions sufficiently captured by the “bare” NP structure in (20)?

(19) [<sub>DP</sub> [<sub>Spec\_DP</sub>] [<sub>D'</sub> [<sub>NP</sub> [<sub>Spec\_NP</sub>] [<sub>N'</sub>]]]]

(20) [<sub>NP</sub> [<sub>Spec\_NP</sub>] [<sub>N'</sub>]]

Using Zwicky’s (1985) criteria in determining the head of a given phrase, Zlatić (1997; 1998) concludes that it is the noun and not the determiner that is the head of S-C nominal phrases. She offers morphological and syntactic evidence to support this claim. In S-C there is just one declension paradigm for (non-personal) pronouns and adjectives, so S-C determiners, just like adjectives, agree in gender, number, and case with the head noun, sharing the same set of morphological endings (21a). This means that S-C D elements are actually adjectives in their morphology. Moreover, these items can be found in post-adjective or post-nominal position, which is generally ungrammatical in languages with articles with the same non-marked order of elements (21b).

- (21) (a) nek-ih                      mlad-ih                      devojak-a  
           some- GEN.FEM.PL      young- GEN.FEM.PL      girl-GEN.FEM.PL  
           “of some young girls”
- (b) devojke            ove            mlade  
           girls                these        young  
           “these young girls”

Based on the facts presented in (21), Zlatić concludes that there are no real determiners in S-C.

Corver (1990; 1993) argues that LBE and AE are licensed only in article-less languages, which apparently lack the determiner projection that serves as a barrier for LBE in languages with articles. The examples in (22) and (23) illustrate the situation in S-C:

- (22) Skupa<sub>i</sub> /      ta<sub>i</sub>      je      vidio      [<sub>i</sub>kola].      (S-C)  
       expensive    that    is      seen      car  
       “He saw an/the expensive / that car.”
- (23) Iz            kojeg      grada<sub>i</sub>      je      Ivan      sreo      [djevojke <sub>i</sub>]?  
       From    which    city      is      Ivan      met      girls  
       “Ivan met girls from which city?”

Bošković (2008) postulates a set of generalizations concerning the syntactic and semantic differences between languages with and without the category of articles. Unlike languages with articles, article-less languages exhibit the following characteristics:

- they allow LBE and AE;
- multiple wh-fronting languages without articles do not show superiority effects;
- a possessive in languages without articles can occur in the predicate position of a copula, unlike possessives in languages with articles;
- S-C possessives cannot be modified by a possessive, unlike in English;
- only languages with articles may allow clitic doubling, etc.

Given these listed typological differences between languages with and without articles, the author concludes that nominal expressions in S-C and other article-less languages have a simple “bare” NP structure with no determiner projection (19), while English and other languages with articles do project a DP, so their nominal expressions should be analyzed on the DP model, presented in (20).

Progovac (1998), Leko (1999), Aljović (2002), Rutkowsky and Progovac (2005), Caruso (2011; 2012), and Stanković (2014a; 2014b) take the opposite perspective,

using the DP model for interpreting S-C NPs. Progovac (1998), Caruso (2011; 2012) and Stanković (2014a) offer some arguments in favor of this approach.

Progovac (1998) notices that the positions of nouns and pronouns with certain restrictive adjectives like *sam* “alone” are fixed and asymmetrical, in the sense that nouns must follow and pronouns must precede them (for a different, no-DP approach cf. Despić [2011]).

Caruso (2011; 2012) critically reviews the “headedness issue” of NPs with determiners (quantifiers) such as *mnogo* “many,” *puno* “a lot of/much,” *malo* “little,” *više* “more,” etc. These quantifiers assign genitive case (and plural) to the noun. In order to case-mark their nominal complements, *mnogo/malo* need to govern and c-command them, because, by definition, governors are heads (Haegeman 1994). The author concludes that this means that, at least when it comes to quantifiers, they should be analyzed in the head of a DP, with their nominal complement positioned in an NP.

Finally, Stanković (2014a) shows that SC spatial and temporal adjectives, as well as possessive adjectives and pronouns in pre-cardinal position only have a definite/unique/specific (D/U/S) reading (*sutrašnjih/njihovih pet prezentacija*), argued to be obtained by a movement of the adjectives from the inflectional domain in post-cardinal position (where they are ambiguous in terms of definiteness/uniqueness/specificity) to some functional projection of the split-DP in order to express features implicit from their lexical content:

- (24) [<sub>DP</sub>[<sub>CardP</sub> pet [<sub>FP</sub>[sutrašnjih / njihovih] [<sub>F</sub>[<sub>NP</sub> prezentacija]]]]] (ambiguous)  
 five tomorrow’s their presentations  
 “five of tomorrow’s / their presentations”  
 “tomorrow’s / their five presentations”  
 → [<sub>DP</sub>[<sub>FP</sub> [sutrašnjih / njihovih] [<sub>F</sub>[<sub>CardP</sub> pet [<sub>NP</sub> prezentacija]]]]] (D/U/S)  
 tomorrow’s their five presentations  
 “five of tomorrow’s / their presentations”  
 #“tomorrow’s / their five presentations”

In this subsection I have presented the main arguments for and against the application of a DP model to S-C, a language with no articles. Before that, in Subsections 2.1 and 2.2, we examined the syntax and semantics of LAFs and SAFs, as seen in previous linguistic literature, as well as Cinque’s (2010) distinction between DMA and IMA. Now we have all the theoretical background and data necessary for investigating the phenomenon of S-C adjectives *pomenuti/navedeni* “mentioned” and *izvesni/određeni* “certain.” The next section is dedicated to the empirical facts about these adjectives.

### 3. Empirical Facts

The S-C adjectives *pomenuti/navedeni* “mentioned” as LAFs are ambiguous between the referential reading, signaling that the referent of the entire noun phrase is already part of the discourse-model at the current stage of conversation (Heim 2002), and the non-referential interpretation, in which they simply modify the reference of the NP, with no direct implication on the discourse-status of the referent shared by the interlocutors. In (25) the adjective *navedeni* “mentioned, stated” can be interpreted at the level of discourse, pointing to information introduced to the discourse-model exclusively by one of the interlocutors. In the non-referential reading, the adjective is modifying the reference of the expression, denoting the event of mentioning/stating particular great project by some speaker outside the set of current conversation participants.

- (25) Naveden-i        sjajan        projekat    počinje.        (ambiguous) (S-C)  
           stated-LAF     great-SAF    project     begins  
           “The mentioned/stated great project is beginning.”

In the referential reading the first adjective behaves as a discourse marker of pragmatic definiteness, with semantics very close to the one exposed by the definite article. As expected, in S-C LAFs appear in this kind of contexts, as SAFs are already qualified as indefinite. But, notice that in (25) a LAF is preceding a SAF, contrary to Leko’s (1992) restriction, given in (13d). We will soon see that a closed set of LAFs can precede SAFs (which can precede LAFs themselves), for what I will offer an explanation. For now, we will just conclude that the adjective *navedeni*, when first positioned in the nominal expression, can get a referential reading. This interpretation is absent in case that the adjective *navedeni* is in second position, following the adjective *sjajan* “great”:

- (26) Sjajan        naveden-i    projekat    počinje.        (non-referential)  
           great-SAF     stated-LAF    project     begins  
           “A great mentioned/stated project is beginning.”

In sentence (26) the locutor is introducing a discourse-new NP, indicated by the SAF of the first adjective. This is blocking the referential interpretation that some great project has been already discussed in the ongoing conversation—in this ordering the expression denotes that the project has been stated/mentioned in some previous communication act, but not in the current one. Nevertheless, no significant change in this perspective is obtained by using the LAF (*sjajn-i* “great”) for the first adjective and/or SAF (*navedeni* “mentioned, stated”) for the second one, as one can hardly get the reading that the expression is referring to a previously mentioned great project, using the second adjective for marking the discourse-old status of the entire noun phrase:

- (27) Sjajn-i naveden / naveden-i projekat počinje. (non-referential)  
 great-LAF stated-SAF stated-LAF project begins  
 “The great mentioned/stated project is beginning.”

Also, it is indicative that the adjective *navedeni* “mentioned, stated” prefers the LAF in the referential reading. In (28) the ordering of adjective forms is following Leko’s (1992) restriction (that SAFs precede LAFs), but the expression cannot get the intended interpretation, as the discourse status of the phrase is interpreted based on the form of the first positioned adjective:

- (28) Naveden / sjajan / sjajn-i projekat (non-referential)  
 stated-SAF great-SAF great-LAF project  
 “a great mentioned/stated project”

One more fact is indicating that the structure position of the analyzed adjectives is high in the syntactic tree, presumably in DP. Namely, Cinque (2010) states that the superlative/comparative morpheme is merged high up in the functional structure of the DP, above the functional projection hosting IMAs, from where it attracts the adequate adjective. This is why superlatives/comparatives always precede other adjectives:

- (29) (a) longest nice movie, \*long nicest movie  
 (b) nicest long movie, \*nice longest movie

Contrary to Cinque’s expectation, the analyzed adjectives in their referential reading always precede superlatives/comparatives, while in post-superlative/post-comparative position they only have the non-referential interpretation (if the phrase is acceptable at all):

- (30) (a) pomenut-i najbolji film (ambiguous)  
 mentioned-LAF best movie  
 “the mentioned best movie”  
 (b) (?)najbolji pomenut-i film (non-referential)  
 best mentioned-LAF movie  
 (?)“the best mentioned movie”

Due to the fact that the adjective *navedeni* “mentioned, stated” is interpreted at the level of discourse (marking the referential status of the entire expression), combining it with its antonym, “not stated” is not prohibited. The very existence of acceptable,

pseudo-oxymoronic phrases such as (31) shows that the two antonyms are not interpreted at the same level:

- (31) Naveden-i / (u radu) naveden fakat začuđuje.  
 stated-LAF in paper not stated-SAF fact makes wonder  
 “The mentioned/stated fact not mentioned/stated (in the paper) makes one wonder.”

In the example (31) we see that the higher positioned adjective is interpreted at the level of discourse, modifying the referent of the NP, while the lower antonym is modifying the reference, being it interpreted at the proposition level. Once more, we notice that in the referential reading LAF can be positioned before SAF. One should keep in mind that the presented distinction in the level of interpretation of the analyzed adjectives is not based on the contrast between S- and I-level properties denoted by DMAs and IMAs, respectively (Cinque 2010):

- (32) invisible<sub>S-level</sub> visible<sub>I-level</sub> stars  
 “generally visible stars that are not visible at the moment of speaking”

Finally, in the same reading the adjective *navedeni* “mentioned, stated” blocks LBE and AE, contrary to Bošković’s (2008) generalization, as it acts like a barrier for extractions of elements out of the nominal expression:

- (33) \*Skupa<sub>i</sub> je video [navedena t<sub>i</sub> kola].  
 expensive is seen stated car  
 “It is the mentioned/stated expensive car that he saw.”

- (34) \*Iz kojeg grada<sub>i</sub> je Ivan sreo [navedene devojke t<sub>i</sub>]?  
 from which city is Ivan met mentioned girls  
 “Ivan met the mentioned / certain girls from which city?”

This empirical fact strongly suggests that the adjective *navedeni* “mentioned, stated” should be analyzed in (some kind of) DP, as I will argue in the next section. But, before that, we will take a look at another adjective, *određen* “determined, certain,” which exposes similar syntactic behavior (and semantics) to the one seen with *navedeni* “mentioned, stated.”

The adjective *određen* “determined, certain,” when first-positioned in the nominal expression, is ambiguous between the epistemic reading, marking that the referent of the noun phrase is outside the epistemic domain of the locutor, and the non-epistemic reading, when it simply contributes to the reference description, with no implications on the epistemic dimension of the nominal expression:

- (35) *Određen-i*      *sjajan*      *projekat*   *počinje.*      (ambiguous)  
 determined-LAF   great-SAF   project   commences  
 “The determined / a certain great project is commencing.”

Just like in the case of *navedeni* “mentioned, stated” the adjective *određen* “determined, certain” must be in LAF and in initial position of the expression for obtaining the epistemic reading, (36). Also, in the epistemic interpretation this adjective precedes superlatives/comparatives, (37), it can appear in pseudo-oxymoronic phrases, (38), and it serves as a barrier for LBE and AE, (39)–(40).

- (36) *Sjajni*      *određen/*      *određen-i*      *projekat* *počinje.*      (non-epistemic)  
 great-LAF   determined-SAF   determined-LAF   project   commences  
 “The great determined project is commencing.”

- (37) (a) *određen-i*      *najbolji* *film*      (ambiguous)  
 determined-LAF   best   movie  
 “the determined / a certain best movie”

- (b) (?)*najbolji*      *određen-i*      *film*      (non-epistemic)  
 Best      determined-LAF   movie  
 (?)“the best determined movie”  
 #“a certain best movie”

- (38) *Na*      *određenoj,*      *još*      *neodređenoj*      *temperaturi* *počinje*      *fuzija.*  
 on      determined more      not determined      temperature starts      fusion  
 “The fusion starts at a certain, still not determined temperature.”

- (39) \**Skupa<sub>i</sub>*      *je*      *video*      [*određena*      *t<sub>i</sub>* *kola*].  
 expensive      is      seen      determined      car  
 “It is a certain expensive car that he saw.”

- (40) \**Iz*      *kojeg* *grada<sub>i</sub>* *je* *Ivan* *sreo*      [*određene*      *devojke* *t<sub>i</sub>*?]  
 from which city      is Ivan met      determined      girls  
 “Ivan met certain girls from which city?”

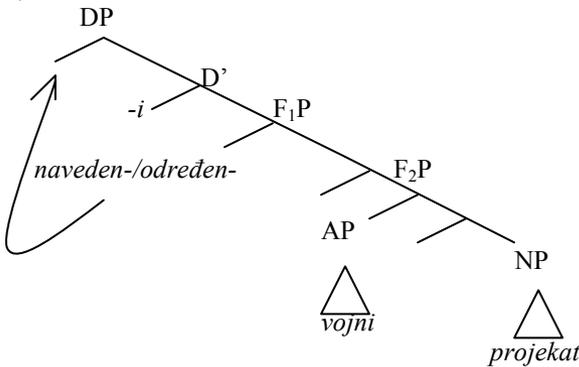
Once again, as in the case of *navedeni* “mentioned, stated,” the adjective *određen* “determined, certain” gives us a strong empirical support that there must be some functional projection above S-C NPs responsible for the discourse status of the referent of the nominal expression. This will be the objective in the next section, as I will propose a DP analysis for the presented facts.

## 4. The Proposal

In the previous section we concluded that certain S-C adjectives exhibit some features characteristic for definite articles and epistemic/specificity markers, as they give value to d-features, providing the interlocutor with information about the referential or epistemic aspects of the denotation of an expression. The adjectives *navedeni* specifies that the nominal expression finds a referent in the hearer's discourse domain, [prox:+<sub>2nd</sub>], while *određeni* specifies that the nominal expression does not find a referent in the speaker's epistemic domain, [epist:-<sub>1st</sub>]. Still, this is not sufficient for arguing in favor of a DP analysis. In addition, we saw that in their referential/epistemic reading these adjectives always precede other adjectives and superlatives/comparatives, that they prefer the LAF, can regularly be found before SAFs and can be combined with their antonyms. These facts suggest that there might be some functional projection of the D type above S-C NPs. The most convincing argument in favor of a DP analysis is the fact that the functional projection the analyzed adjectives are hosted by is disallowing LBE and AE.

In our proposal the analyzed adjectives are initially merged as SAFs, and they subsequently make an A-movement to the assumed determiner projection, where they trigger the referential/epistemic reading. The morphological ending of LAFs, *-i*, is located in the head of DP. After being derived as SAFs, in the functional projection hosting predicatives of reduced relative clauses, the analyzed adjectives climb up to Spec\_DP:

(41)



The proposed analyses can account for all of the presented data. First of all, it explains why the explored adjectives must be in initial position and in LAF for triggering the referential/epistemic reading—they have to climb to DP, where the head position is occupied by the marker of definiteness/epistemic specificity, *-i*, and check the definiteness/epistemic feature. As a consequence, these adjectives (in the intended readings) always precede superlatives/comparatives and can regularly precede SAFs. Also, this explains

the acceptability of the presented pseudo-oxymoronic phrases. At last, the structure in (41) offers a simple explanation for the blocking effect we have witnessed on LBE and AE—the saturated DP in S-C acts like a barrier for extractions of elements out of the nominal expression, similarly to the state in languages with articles. On the other side, it seems that the opposing, “bare” NP approach has no explanation for this data.

Actually, the list of S-C adjectives that perform an A-movement from the so-called inflectional domain to DP (with similar syntactic features and referent-modifying semantics) is not exhausted with the four analyzed items. In (42) some of these adjectives are presented.

- (42) (a) nov-i          nov /          nov-i          auto  
           new-LAF      new-SAF      new-LAF      car  
           “another new car”
- (b) star-i      star /      star-i      profesor  
           old-LAF    old-SAF    old-LAF    professor  
           “the previous old professor”
- (c) dat-i          dat /          dat-i          lek  
           given-LAF    given-SAF    given-LAF    medicine  
           “the (contextually) given handed medicine”
- (d) konkretn-i    apstraktan /    apstraktn-i    predlog  
           concrete-LAF    abstract-SAF    abstract-LAF    proposal  
           “a/the concrete abstract proposal”
- (e) ostali-i          ostal-i          bakar  
           left-LAF          left-LAF          cuprum  
           “the rest of the cuprum left”
- (f) dotičn-i          dotičn-i          kabl  
           touching-LAF    touching-LAF    cable  
           “the mentioned contact-making cable”
- (g) nepoznat-i      poznat /      poznat-i      umetnik  
           unknown-LAF    known-SAF    known-LAF    artist  
           “a (contextually) unknown famous artist”

In (42a) the second adjective *novi* “new” is interpreted as “brand new, recently manufactured,” modifying the reference of NP as IMA. On the other side, the initial adject-

tive gets a referential reading “another,” presupposing other introduced referents, while marking the discourse status of the referent as discourse **new**. The same accounts for (42b) and (42c), where the initial adjectives *stari* “old” and *dati* “dati” signalize that the referent of NP is discourse old and given. The phrase in (42d) denotes a specific, particular proposal, implied by the epistemic reading of the adjective *konkretni* “concrete” which seems to be abstract in its nature. Just like in the cases presented in the previous section, the adjectives *concrete* and *abstract* are not interpreted at the same level, so they can be combined in a single, oxymoronic phrase. The first adjective *ostali* “left” in (42e) is referring to the complement-subset of the set of keys left that has already been introduced to discourse. The initial adjective in (42f) *dotični* “touching” has the referential reading that the referent of the entire phrase is discourse-old (cf. “we **touched** upon the cable” in English), while the second one is attributing contact-making to its reference. Finally, the antonyms in (42g) are acceptable in a single phrase as the first one has the referential reading that the referent of NP is out of the referential domain of the interlocutors, but the second one is modifying the reference.

All of the initial adjectives in (42) share the same features presented with the adjectives *navedeni* “mentioned, stated” and *određeni* “determined, certain.” They:

- have a referential or epistemic reading, modifying the referent of the expression;
- block LBA and AE;
- always precede other adjectives;
- always precede superlatives/comparatives;
- prefer the long adjective form (so-called definite adjectival aspect);
- can regularly precede short adjectives (indefinite adjectival aspect).

We will just conclude that the described phenomenon is not limited and marginal, but it presents a systematic process of grammaticalization of post-determiners (as Breban and Davidse [2003] term the adjectives *other, same, comparable*, etc.), present both in languages with and without the category of definite article, cf. the examples in English in (42c) and (42e). The present LAF in case of S-C is a consequence of the structure position these items seem to occupy in the analyzed readings, namely, DP (as proposed in [41]), and not as a direct repercussion of the argued grammaticalization process involved.

This brings us to the question of a possible third type of adjective modification, positioned high at the left periphery of DP. At this structure position adjectives modify the referent of the noun expression, giving value to d-features, unlike DMAs and IMAs, which modify the reference of NP. In the absence of an obligatory determiner the described A-movement of adjectives is rather frequent, in contrast with the languages with articles. So, although S-C has no articles and its functional elements (demonstratives, quantifiers) share some morphological and syntactic features with adjectives, the

investigated items still can satisfy the demands of the argued functional projection. As for languages with articles, the obligatory presence of a determiner syntactically and semantically limits (to a certain degree) the movement of adjectives to the left periphery. This is why this phenomenon is less frequent in languages with articles.

## 5. Conclusion

In this paper I tried to offer an answer to the question: is there a need for projecting a DP in an article-less language or is the syntax of S-C nominal expressions sufficiently captured by the “bare” NP structure? I argued that, in the case of the adjectives *pomenuti/navedeni* “mentioned” and *izvesni/određeni* “certain,” applying a DP-model on a language with no articles is not *déplacé* and matter of mere urge for a unified structure, but a choice based on empirical facts. We saw that these elements share many syntactic and semantic features with definite articles and epistemic markers, all of which can successfully be analyzed using the DP model. In addition, we touched upon the idea that there is a distinct, third type of adjective modification, located high at the left periphery of DP. I assumed that at this structure position the adjective is interpreted at a more abstract level of discourse, modifying the referent, and not the reference of the entire NP.

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# Watch Out for the Universal Quantifier

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**Abstract:** This paper provides an analysis of a particular distributional contrast of Czech free choice items (FCIs): their exclusion from the scope of sentential negation versus their non-problematic occurrence under the scope of a negated possibility modal. FCIs are treated as indefinites with an additional pragmatic licensing requirement and a potential to introduce sets of propositional alternatives. It is argued that their exclusion from the scope of sentential negation is due to morphological blocking by negative indefinites. It is proposed that the blocking is suspended by the introduction of a possibility modal into the sentence. The possibility modal inserts an extra universal quantification, providing more scoping options to the negative operator. The structures containing FCIs are no longer in concurrence with the structures with negative indefinites, and therefore both FCIs and negative indefinites are allowed in the environment of negated possibility modals, with respective differences in the meaning.

**Keywords:** modal semantics; negation; indefinites; free choice items.

## 1. Introduction

The analysis presented here aims to explain the following data contrast observed in Czech: Czech free choice items (FCIs) are banned from the scope of sentential negation. In such cases they have to be replaced by the corresponding indefinite of the negative series (negative indefinites—NIs or n-words); see (1a). This is surprising because sentential negation as a downward entailing (DE) operator should license them (see Section 1.1 for more details). Through the insertion of a possibility modal into the sentence, FCIs become acceptable; see (1b).

- (1) (a) Ne-přišel                    # kdokoliv /            ✓ nikdo.  
           NEG-came-3.SG        FCI: anyone        NI: no one  
           “No one came.”

- (b) Ne-mohl přijít ✓ kdokoliv / ✓ nikdo.  
 NEG-could-3.SG come-INF FCI: anyone NI: no one  
 “Not everyone could come.” / “No one could come.”

I build on the seminal work of Kadmon and Landman (1993)—and extend Aloni’s (2007) modal and alternative semantics to Slavic data. I also apply Pereltsvaig’s (2006) morphological blocking approach to Russian negative polarity items to Czech FCIs. The core of my analysis is the idea that in negative concord languages (at least in languages of the Slavic strict negative concord type) *n*-words and FCIs are in concurrence for insertion in the context of sentential negation, but they are not in concurrence in the negated possibility modal context. Therefore only one of these forms is allowed to be inserted in the first case and both forms can be used in the second case. I treat Czech FCIs as indefinites containing an existential quantifier which has the potential to introduce a set of propositional alternatives. Modal verbs, but not negation, then act as operators over this set.

### 1.1 Czech FCIs as Indefinites: Widening and Strengthening

Czech FCIs are morphologically complex forms. They are built of the *wh*-stem and the *-koli(v)*<sup>1</sup> affix encoding the free choice meaning. Different series of indefinites are derived by other affixes; see some examples in Table 1; the free choice series is in bold.

|             | <i>wh</i>    | <i>ně-wh</i>                 | <i>ni-wh</i>                      | <b><i>wh-koli(v)</i></b>                |
|-------------|--------------|------------------------------|-----------------------------------|---|
| who         | <i>kdo</i>   | <i>ně-kdo</i><br>“someone”   | <i>ni-kdo</i><br>“no one”         | <b><i>kdo-koli(v)</i></b><br>“anyone”   |
| what        | <i>co</i>    | <i>ně-co</i><br>“something”  | <i>ni-c</i><br>“nothing”          | <b><i>co-koli(v)</i></b><br>“anything”  |
| which       | <i>který</i> | <i>ně-který</i><br>“some”    | —                                 | <b><i>který-koli(v)</i></b><br>“any”    |
| what<br>ADJ | <i>jaký</i>  | <i>ně-jaký</i><br>“some”     | <i>žádný</i> <sup>2</sup><br>“no” | <b><i>jaký-koli(v)</i></b><br>“any”     |
| where       | <i>kde</i>   | <i>ně-kde</i><br>“somewhere” | <i>ni-kde</i><br>“nowhere”        | <b><i>kde-koli(v)</i></b><br>“anywhere” |
| when        | <i>kdy</i>   | <i>ně-kdy</i><br>“sometimes” | <i>ni-kdy</i><br>“never”          | <b><i>kdy-koli(v)</i></b><br>“any time” |
| how         | <i>jak</i>   | <i>ně-jak</i><br>“somehow”   | <i>ni-jak</i><br>“in no way”      | <b><i>jak-koli(v)</i></b><br>“any way”  |

**Table 1.** Czech indefinite series: examples.

1 The *-v* in the *-koli(v)* affix is optional and it is disappearing from today’s Czech. Diachronically, it comes from *věk* (“age” in contemporary Czech, “life” in old Czech) and is supposed to strengthen the free choice meaning; compare Kopečný et al. (1980, 332).

2 The pronoun *žádný* “no-ADJ” is an irregular form that was inserted into the indefinite system during the historical development of Czech; details of the process are irrelevant to our topic.

Czech pronouns with the *-koli(v)* affix fit well into the cross-linguistic distributional pattern for FCI (described, e.g., in Haspelmath [1997]): they are banned from episodic sentences, as in example (2b)<sup>3</sup> and necessity modal statements,<sup>4</sup> in (3), but they are often used in possibility modal (3)<sup>5</sup> or habitual statements (2a).<sup>6</sup> Other attested licensing environments are:<sup>7</sup> universal concessive conditionals headed by the complementizer *ať* “let,” in (4),<sup>8</sup> comparatives, antecedents of implication, generic sentences, weak or indirect negation,<sup>9</sup> conditional mood, imperative, adversative predicates and disjunction. They are also common as a part of free relative constructions (5).<sup>10</sup>

- (2) (a) Nejmenované zdroje vždycky spolehlivě vyzradí cokoliv.  
 unnamed sources always reliably leak-PRES anything  
 “The unnamed sources always reliably leak anything.”
- (b) # Nejmenované zdroje vyzradily cokoliv.  
 unnamed sources leaked anything  
 (int.: “The unnamed sources leaked everything.”)
- (3) Mohl / # **musel** jet kamkoliv.  
 could had to go anywhere  
 “He could (# had to) go anywhere.”
- (4) Ať už onen kus papíru skrýval cokoliv,  
 let yet that piece paper-GEN hide-PAST anything  
 bylo to pryč.  
 was-3.SG it gone  
 “Whatever it was that the piece of paper was hiding, it was gone.”
- (5) Cokoliv zhotovíte, bude se nám líbit.  
 anything make-FUT.2.PL AUX.FUT.3.SG REFL we-DAT like  
 “We will like whatever you make.”

3 For the classical explanation see Kadmon and Landman (1993).

4 One of the latest analyses of the contrast between licensing by possibility and necessity modals can be found in Aloni (2007).

5 Corpus example (SYN2010).

6 Corpus example (SYN2010).

7 Corpus studies focused on the distribution of Czech FCIs were conducted by Dočekal and Strachoňová (forthcoming) and Šimík (2008).

8 Corpus example (SYN2010).

9 This term is used by Dočekal and Strachoňová (forthcoming) for cases of licensing of FCIs by negation in the higher clause or licensing of FCIs by other DE operators (for example, by the preposition *bez* “without” or the conjunction *aniž* “without”—clausal.)

10 Corpus example (SYN2010).

In contrast to English, Czech (and Slavic languages in general) FCIs are not licensed by sentential negation—recall example (1a).<sup>11</sup> This poses a problem for the application of general semantic theories of FCIs, developed for English, to Slavic data. The canonical work of Kadmon and Landman (1993) provides a convincing analysis of English FCIs representing *any* as an indefinite pronoun licensed in DE contexts. Although there have been some relevant responses to this approach that point out its problems in modal and generic contexts (first of all Dayal [1998], then, e.g., Menéndez-Benito [2005]), my proposal builds on the core idea of Kadmon and Landman’s (1993) model, which I will sum up briefly and very simply.

The authors argue against any inherent modal or universal quantificational force in the semantics of *any*. They present arguments for the claim that the universal-like meaning of *any* is just an effect caused by the interaction of the clausal context and the indefinite, which is by no means different from the universal-like meaning of an indefinite article in the same environment. The difference between *any* and a plain indefinite lies in the capacity of *any* to widen the domain of quantification; specifically, *any* quantifies over the largest contextually given domain of individuals possible.<sup>12</sup> A free choice indefinite is then licensed only if the widening of the domain leads to logical strengthening of the meaning. In other words, the sentence containing the denotation of the widened domain has to be logically stronger than the corresponding sentence containing the denotation of the smaller domain. Logical strength is defined by entailment: the stronger statement asymmetrically entails

11 I would like to point out that I am aware of two types of structures in which FCIs are successfully used with sentential negation in Czech as well. I mean: 1) the strong/emphatic/attributive use in which the insertion of the FCI creates an even stronger negative statement than simple negation (Kadmon and Landman 1993; Błaszczak 2001; and others)—see corpus example in (i); and 2) the “just any” reading (called metalinguistic-sounding negation in Chierchia [2013] and indiscriminative meaning of FCIs in Šimík [2008]); compare the corpus example in (ii). My present analysis has nothing to say about those cases, I will just assume that these are not cases of the operator of sentential negation scoping over the existential quantifier carried by the indefinite; for more details about different types of negation see, e.g., Horn (1989).

- (i) Vyšetření nenaznačují jakýkoliv výskyt infekce.  
 examinations NEG-imply any occurrence-ACC infection-GEN  
 “The examinations don’t imply any occurrence of infection **at all**.”
- (ii) Nemyslí jakoukoliv ženu, ale výslovně Gythu.  
 NEG-means any women-ACC but namely Gytha-ACC  
 “He does not mean **just any** women but Gytha specifically.”

12 This property of *any* was experimentally tested and confirmed in Tieu (2013).

the weaker one.<sup>13</sup> In a nutshell, FCIs in Kadmon and Landman’s model are just indefinites licensed by such contexts in which the widening of the quantificational domain leads to the logical strengthening of the meaning. The DE environment goes well with this requirement. The DE property is usually defined as a context which causes the transference of truth values from the set to its subsets.<sup>14</sup> It follows that in all DE contexts the widening/strengthening licensing condition of FCIs is satisfied.

Sentential negation as a prototypical DE environment should license FCIs. That can be successfully observed in English, but not in Slavic languages. However, I will argue in this article that Kadmon and Landman’s approach to the licensing of FCIs is valid and the banning of Slavic FCIs from the immediate scope of sentential negation appears as a consequence of an independent phenomenon—negative concord.

## 1.2 1.2 Czech n-Words as Indefinites: Negative Concord

Czech, as a Slavic language, displays negative concord: in a sentence with sentential negation (morphologically marked by the prefix *ne-* on the predicative verb) and a pronoun from the negative series (see the *ni-wh* column in Table 1 for Czech), only one negation is semantically interpreted. This concord is of the strict type:<sup>15</sup> regardless of the number of n-words or their position with respect to the predicative verb, only one negation is interpreted;<sup>16</sup> see the example in (6).

- (6) Nikdo z nich nepřišel nikdy nikam.  
 nobody from they-GEN NEG-came never nowhere  
 “None of them ever came anywhere.”

I will not go into the details of the formal analysis of negative concord (compare Zeijlstra [2007]), but just note that today’s standard treatment of n-words in strict negative concord languages is that they are semantically non-negative indefinites—morphologically marked for being in the scope of sentential negation; compare the scope of the existential quantifier (hereinafter  $\exists$ ) with respect to the scope of negation in the sentence with a plain indefinite in (7a) and the one with an n-word in (7b).

13 Definition of entailment:

“A entails B = df – whenever A is true, B is true  
 – the information that B conveys is contained in the information that A conveys  
 – a situation describable by A must also be a situation describable by B  
 – A and not B is contradictory (can’t be true in any situation)”  
 (Chierchia and McConell-Ginet 1990, 18)

14 Definition of DE (compare to, e.g., Fintel [1999]): operator Op is DE iff  $A \subseteq B \rightarrow Op(B) \subseteq Op(A)$ .

15 See the typology of languages by negative concord, e.g., in Zeijlstra (2004).

16 Compare to, e.g., Spanish, which displays negative concord only in the postverbal position; therefore it belongs to the group of non-strict negative concord languages.

- (7) (a) Někdo nepřišel.  $\exists x[\text{person}'(x) \wedge \neg \text{came}'(x)]$   
 somebody NEG-came  $\exists > \neg$   
 "Somebody didn't come."  
 (b) Nikdo nepřišel.  $\neg \exists x[\text{person}'(x) \wedge \text{came}'(x)]$   
 nobody NEG-came  $\neg > \exists$   
 "Nobody came."

We can also say that Czech n-words are non-specific in the sense that they cannot have the widest scope in the sentence. However, this property seems to follow from their obligation to scope below negation. They are in no way forced to scope under other operators; see example (8a) and its preferred interpretation in (8b).

- (8) (a) Petr nevzal žádnou dívku na všechny filmy.  
 Peter NEG-took no-ACC girl on all-ACC movies-ACC  
 "Peter didn't take any one girl to all the movies."<sup>17</sup>  
 (b)  $\neg \exists x[\text{girl}'(x) \wedge \forall y[\text{movie}'(y) \rightarrow \text{took}'(\text{Peter}', x, y)]]$   $\neg > \exists > \forall$

Moreover, it has been observed (but until now not formally analyzed) that by forcing the higher scope of the universal quantifier (hereinafter  $\forall$ ) in the surface order of arguments of double object construction the licensing of n-words fails and the sentence becomes impossible to interpret. This blocking is usually called the intervention effect:<sup>18</sup> an intervening  $\forall$  cancels the licensing of n-words by negation; compare the acceptable sentence in (8) and the one in (9), which differs only in the switched positions of  $\forall$  and  $\exists$  but is incomprehensible to native speakers of Czech.

- (9) (a) # Petr nevzal všechny dívky na žádný film.  
 Peter NEG-took all-ACC girls-ACC on no-ACC movie-ACC  
 (b) intended meaning:  
 $\neg \forall x[\text{girl}'(x) \rightarrow \exists y[\text{movie}'(y) \wedge \text{took}'(\text{Peter}', x, y)]]$   $\neg > \forall > \exists$

To conclude, I have argued that Czech n-words are, from the semantic point of view, non-negative indefinites which necessarily scope immediately below sentential negation.

17 A more detailed paraphrase: There was no particular girl who Peter would take to every movie.

18 For more details see Błaszczak (2001) for Polish and Dočekal (in this volume) for Czech.

## 2. Semantics of Propositional Alternatives: Aloni (2007)

In this section I will introduce some technical tools used in my proper analysis (Section 3). In the first place, I build on Aloni's work on the semantics of FCIs, modals and imperatives—Aloni (2007). She accepts Kadmon and Landman's claim about the semantic nature of FCIs (indefinites with the widening/strengthening licensing condition). What she adds to their proposal is the notion of a set of propositional alternatives which comes into the derivation with the  $\exists$  of the indefinite. Modal verbs (and imperatives) are then represented as operators quantifying over these sets. Now I will look closely at some aspects of her model.

### 2.1 FCIs as Alternatives Inducing Items

In a sentence such as the one in (10a) the meaning of the proposition—[come (anybody)]—is represented as a set of possible values which the proposition containing  $\exists$  can have. Aloni (2007) claims that every  $\exists$  (and every disjunction) has the potential to introduce a set of propositional alternatives ( $p$ ).<sup>19</sup> In the case of a free choice indefinite such a set is always introduced.<sup>20</sup> See (10b) for the  $p$  of the example sentence: *Peter, Carl, and Mary* are contextually relevant individuals represented by  $d_1$ ,  $d_2$ , and  $d_3$  respectively;  $A$  is the predicate. The value of the proposition changes with the value of the argument the predicate is applied on.

(10) (a) Anybody can come.

(b)  $p = \{\text{Peter comes; Carl comes; Mary comes...}\} \gg p = A(d_{1-n})$

The formalization of a proposition containing a free choice indefinite is given in (11b): there is a set of propositional alternatives and there is an  $x$  and the alternatives in the set have the following form—predicate  $A$  is applied to the  $x$ . Compare the meaning in (11b) to the meaning of the corresponding proposition with an indefinite which does not introduce propositional alternatives in (11a). A modal acts as an operator scoping over the set of alternatives—schematically in (11c) with *can*.

(11) (a)  $\exists x(A(x))$

(b)  $\exists p(p \wedge \exists x(p=A(x)))$

(c) **can**  $(\exists p(p \wedge \exists x(p=A(x))))$

19 These alternatives have a very similar character to the alternatives used in the Hamblin/Karttunen tradition for the semantics of questions or to the alternatives known from Rooth's (1995) work on the semantics of focus.

20 In contrast to, e.g., indefinite articles; compare Aloni (2007, 81–82).

I have just given Aloni's semantics for a proposition with a free choice indefinite—in (11b)—and I will continue focusing on her approach to modals.

## 2.2 Modals as Quantifiers

Modals are represented as quantifiers over propositional alternatives and possible worlds in Aloni (2007).<sup>21</sup> Since necessity modals do not license FCIs (a fact Aloni's approach accounts for) and my analysis aims to explain a data contrast observed with possibility modals, I will provide details of her analysis for possibility modals only and limit my attention to necessity modals only to footnote remarks.

Aloni (2007) argues that for structures with propositional alternatives an extra quantification needs to be added to the standard quantification over possible worlds, namely the quantification over those alternatives. Possibility modals then introduce two different quantifications into the sentence: an existential quantification over possible worlds ( $w$ ) and a universal quantification over propositional alternatives ( $\alpha$ ); compare the schematic representation of, e.g., *can* in (12a) and of a sentence containing *can* in (12b).

(12) (a)  $\forall\alpha\exists w$

(b)  $\forall\alpha\exists w(A(x))$

Putting together the formula in (11b) for a statement with propositional alternatives and the one in (12b) for a modal statement, we will get (13b)—a representation of the meaning of the sentence in (13a): for every alternative—such that there is an  $x$  and the alternative has the form of  $x$  having both the property of *being a person* and *come*—there is a possible world in which this alternative is true.<sup>22</sup>

(13) (a) Anybody can come.

(b)  $\forall\alpha [(i(\alpha)\wedge\exists x(\alpha=[\text{person}'(x) \wedge \text{come}'(x)]))] \exists w(\alpha)$

21 In cases of a proposition without alternatives, the modal quantifies over a singleton set—just over the single proposition; see Aloni (2007, 77–81).

22 Necessity modals are represented as inserting a universal quantification over possible worlds and an existential one over propositional alternatives. A schematic representation of a necessity statement (analogous to the possibility modal statement in [12b]) is shown in (iii).

(iii)  $\exists\alpha\forall w(A(x))$

In fact, representing possibility modals with universal quantification over propositional alternatives and necessity modals with an existential one is the crucial point of Aloni's analysis, which explains the contrast between the licensing of FCIs by the two types of modals; see Aloni (2007, 81–83).

At this point I have established all the basic formalizations necessary for my analysis. The last part of the section is dedicated to making precise some details about the interaction of the operator of sentential negation, modal operators and sets of propositional alternatives.

### 2.3 Operators

The data contrast introduced at the beginning of this paper involves a negated statement (FCIs banned) and a negated possibility modal statement (FCIs acceptable). Therefore I will now focus on the properties of negation and modal verbs in the frame of Aloni’s proposal. Both elements are represented as operators but only the latter interacts with the set of propositional alternatives introduced by  $\exists$ .<sup>23</sup> In the case of no operator able to interact with the propositional alternatives, the genuine set is reduced to a singleton set containing the standard proposition. Truth-conditionally, there is no difference between a statement containing a non-trivial set of propositional alternatives in (14a) and one with a singleton, the second one in (14b)—they are equivalent<sup>24</sup>—except that the first one allows some extra options for quantifiers (details will be provided in Section 3).

- (14) (a)  $\exists p(p \wedge \exists x(p = A(x)))$                        $p: \{A(d_1), A(d_2), A(d_3) \dots\}$   
 (b)  $\exists p(p \wedge \exists x(p = A(x)))$                        $p: \{A(d)\} \quad \gg \quad \exists x(A(x))$

In the end we have to work with two different (but equivalent) representations of a statement with a free choice indefinite: 1. the one with the non-trivial set of propositional alternatives—in the presence of an operator able to interact with them; and 2. the one with the set reduced to a singleton—in the absence of an operator able to interact with propositional alternatives. Aloni (2007) suggests that modals, imperatives and generic operators act as quantifiers over propositional alternatives; the meaning represented in (14a) is available for these contexts. Negation and other DE operators are not applied to the propositional alternatives, and therefore the meaning represented in (14b) is available for this type of environment. Compare the representation of the meaning for the first type of environment and for the latter in (15), a modal in (a) and sentential negation in (b).

- (15) (a) I **can** eat anything.                       $\forall \alpha[(\alpha \wedge \exists x(\alpha = [\text{thing}'(x) \wedge \text{eat}'(I', x)]))] \exists w(\alpha)$   
 (b) I **didn't** eat anything.                       $\neg \exists x[\text{thing}'(x) \wedge \text{ate}'(I', x)]$

23 Aloni does not speak about the interaction of the negative operator and propositional alternatives directly but I believe my claim follows from her analysis and is supported independently by the work of Rooth (1995, 18–19).

24 Aloni (2007, 73).

### 3. Analysis

In this section I will account for the banning of Czech FCIs from the scope of sentential negation. Then I will suggest a formal explanation for the fact that the possibility modal inserted between the scope of negation and  $\exists$  of the free choice indefinite cancels the ban. The main ingredients of my proposal will be the concurrence in natural language and Aloni's modal semantics.

#### 3.1 FCIs under Sentential Negation

As far as I know, there is one existing approach to the same phenomenon in Polish—Błaszczak (2008)<sup>25</sup>—and one for a similar phenomenon in Russian—Pereltsvaig (2006). I will briefly sum up the main ideas of each of them and argue for the latter, which I will extend to Czech FCIs.

##### 3.1.1 Błaszczak (2008; 2001): De Morgan's Laws

Błaszczak observes that Polish free choice indefinites (derived from the *wh*-stem by the affix *-kolwiek*) have to be replaced by *n*-words in the context of sentential negation; see example (16), taken from Błaszczak (2008, her example [3]) and compare it to the Czech example in (1).

- (16) Ewa nie spotkała # kogokolwiek / ✓ nikogo.  
 Eve NEG met-3.SG anyone-ACC no one-ACC  
 "Eve didn't meet anyone."

Supporting her claim by the etymology of the items in question, she argues that Polish *-kolwiek* pronouns are non-specific indefinites whose semantics involves a concession by arbitrary or disjunctive choice. In the context of sentential negation the logical inference known as De Morgan's laws (see [17]) is activated and the disjunction contained in the FCI is interpreted as a conjunction (the first law in [17]). Consequently, the essence of the meaning of the *-kolwiek* pronouns disappears. Therefore, an *n*-word has to be used (the semantics of *n*-words is modeled by conjunction).

- (17)  $\neg(X \cup Y) \leftrightarrow \neg(X) \cap \neg(Y)$  the first law  
 $\neg(X \cap Y) \leftrightarrow \neg(X) \cup \neg(Y)$  the second law

In spite of the fact that Błaszczak (2008) provides an analysis of exactly the same phenomenon as I observed for Czech, I will not incorporate her analysis into my proposal. I believe it cannot correctly account for the cross-linguistic difference in FCI licensing

<sup>25</sup> Elaborating some ideas of Błaszczak (2001).

(English versus Polish in this case). It must either postulate completely different semantics for Polish and English FCIs (which seems to be the case given the etymological motivation) or assume that De Morgan's first law does not work in English. I am convinced that the source of the banning of Slavic FCIs from the scope of sentential negation has to be sought in some aspect of negation which differs between Slavic languages and English. And that aspect is negative concord, which is absent from English.

### 3.1.2 Pereltsvaig (2006): Morphological Blocking

Pereltsvaig (2006) accounts for the exclusion of Russian negative polarity items (NPIs) of the *-libo* series from the context of sentential negation (which she calls the Bagel Problem). Using the framework of Distributed Morphology (Halle and Marantz [1993]), she argues that the items in question are in competition for insertion with n-words (*ni-* series). In the context of sentential negation n-words—being lexically more specified items<sup>26</sup>—match the specification of the context more closely and consequently win the competition for insertion.

Pereltsvaig builds her analysis on the crucial syntactic/semantic property of Slavic n-words: their lexical specification for being in the scope of sentential negation.<sup>27</sup> I claim that this reasoning is directly applicable to the behavior of Czech FCIs in the scope of sentential negation.

### 3.1.3 Proposal

I argue that a negated sentence containing a free choice indefinite ends up with the same meaning as a corresponding sentence with an n-word. Therefore, the FCI and the n-word become competitors for insertion and the morphological blocking fashion of reasoning is applied: the n-word, which is specified directly for the context of sentential negation, blocks out the FCI. That means that the sentential negation, as a prototypical DE context, licenses Czech FCIs in the same way as it licenses English FCIs. The exclusion of Czech FCI from its scope is caused by independent reasons (morphological blocking by n-words).

N-words are indefinites; therefore I assume that their  $\exists$  has the potential to insert a set of propositional alternatives into the derivation as well. However, there is no operator able to interact with the alternatives, and therefore the set is reduced to a single proposition (see [14b]). The same happens in (18b) in the sentence with an FCI. See the formalizations in (18c) for the meaning of example (1), repeated below as (18a)–(18b);

26 They have a narrower distribution than the *-libo* NPIs in that they are licensed only by the sentential negation.

27 This property is elaborated in detail by Zeijlstra (2004) who argues (within the framework of the Minimalist Program) for an uninterpretable lexical feature [uNEG] on n-words in negative concord languages which has to be checked against an interpretable feature [iNEG] of the operator of sentential negation.

(18d) shows the general formalization for the meaning of any negated proposition containing an n-word or an FCI.

- (18) (a) Ne-přišel                      ✓nikdo.  
 NEG-came-3.SG                    no one  
 “No one came.”
- (b) # Nepřišel                      kdokoliv.  
 NEG-came-3.SG                    anyone  
 (int.: “No one came.”)
- (c)  $\neg\exists p(p\wedge\exists x[p=(\text{person}'(x)\wedge\text{came}'(x))])$     »     $\neg\exists x[\mathbf{person}'(x)\wedge\mathbf{came}'(x)}$
- (d)  $\neg\exists x[A(x)]$

I have just shown that n-words and FCIs are competitors for insertion in the context of sentential negation: the two forms are candidates for the same meaning. The more specified form (the n-word) blocks out the less specified one (FCI in this case). This approach accounts satisfactorily for the fact that Czech FCIs are not blocked out of other DE contexts: Slavic n-words are licensed only by the operator of sentential negation, and therefore they do not compete with other indefinites in the rest of the DE contexts; compare (19a)–(19c).

- (19) (a) Petr    nás    našel    bez    # žádných /    ✓jakýchkoliv    problémů<sup>28</sup>  
 Peter    us    found    without    no-ADJ    any    problems  
 “Peter found us without any problems.”
- (b) Když                      budeš                      mít    # žádný /    ✓jakýkoliv    problém,  
 when                      have-FUT                    have    no-ADJ    any    problem  
 zavolej.  
 call-IMPER  
 “If you have any problem, call me.”
- (c) Bylo    to    horší    než    # žádný /    ✓jakýkoliv    náš    problém.  
 was    it    worse    than    no-ADJ    any    our    problem  
 “That was worse than any of our problems.”

28 The contrast is given for standard Czech. I am aware of the fact that for some speakers n-words are relatively acceptable in this context. However, this acceptance is very rare and related to idiolects rather than dialects or sociolects.

### 3.2 FCIs under Negated Possibility Modals: Proposal

Now I will show that in the context of negated possibility modals n-words and FCIs are not competitors for insertion because they give rise to different meanings of the respective sentences.

Again, both n-words and FCIs introduce a set of propositional alternatives, which is not reduced to a singleton in this case because of the presence of a modal. A modal verb acts as a quantifier over the set—in the case of a possibility modal as a universal quantifier. I have shown in Section 1.2 that no universal quantifier can intervene between the licensing negation and  $\exists$  of the n-word in the sentence. By this finding I support the formalization in (20c) for negated possibility modal statements with an n-word: negation scopes above  $\exists$  over possible worlds and no universal quantification intervenes between negation and the existential quantifier of the indefinite;<sup>29</sup> see (20b), (20c).

- (20) (a) Nemůže                      přijít                      nikdo.  
 NEG-can-3.SG                      come                      no one  
 “No one can come.”

- (b)  $\forall \alpha [(\alpha \wedge \exists x (\alpha = [\text{person}'(x) \wedge \text{come}'(x)]))] \neg \exists w (\alpha)$   
 For every alternative which has the form of there is an x such that x is a person and x comes, there is **no possible world** in which the alternative is true.<sup>30</sup>

- (c)  $\forall \alpha [(\alpha \wedge \exists x (\alpha = A(x)))] \neg \exists w (\alpha)$

For statements with FCIs—in (21), I claim that negation is further from  $\exists$  over individuals. There is  $\forall$  between the negation and  $\exists$ . In constellations like this negation is too far from  $\exists$  and it is unable to license the n-word, and therefore other indefinites (namely FCIs) can be inserted;<sup>31</sup> compare (20) and (21) and their respective meanings.

- (21) (a) Nemůže                      přijít                      kdokoliv.  
 NEG-can-3.SG                      come                      anyone  
 “Not everyone can come.”

29 Schematically, the syntactic structure in (iv) will correspond to the scope ordering in (v).

(iv)  $[\neg [\mathbf{can}] [\text{n-word}]]$                       (v)  $[\forall \alpha > \neg \exists w] > [\exists x]$

30 As correctly pointed out by an anonymous reviewer, placing the negation above the existential quantification over individuals would lead to truth conditions which are too weak. It would correspond to the so-called split scope reading of n-words, which is not attested for Slavic languages.

31 Schematically, the syntactic structure in (vi) will correspond to the scope ordering in (vii).

(vi)  $[\neg [\mathbf{can}] [\text{FCI}]]$                       (vii)  $[\neg \forall \alpha > \exists w] > [\exists x]$

$$(b) \neg \forall \alpha [(a \wedge \exists x (\alpha = [\text{person}'(x) \wedge \text{come}'(x)]))] \exists w(\alpha)$$

**Not for every alternative**—which has the form of there is an  $x$  such that  $x$  is a person and  $x$  comes—there is a possible world in which the alternative is true.

$$(c) \neg \forall \alpha [(a \wedge \exists x (\alpha = A(x))] \exists w(\alpha)$$

## 4. Conclusion

### 4.1 Concurrence and the Scope of Negation

In this paper I address a particular contrast in the distribution of Czech FCIs: negated statements (FCIs banned) versus negated possibility modal statements (FCIs licensed). I build on Aloni's formal treatment of the semantics of FCIs and modals (which is an extension of Kadmon and Landman's [1993] approach). I have argued that in statements with sentential negation only, Pereltsvaig's (2006) morphological blocking by  $n$ -words is applicable to Czech FCIs as well, whereas the insertion of a possibility modal into the structure brings out new scoping options for the negative operator and more than one meaning becomes possible for the sentence. Consequently the structure with negation scoping immediately above the existential quantification over indefinites is spelled out with an  $n$ -word and the corresponding structure in which the universal quantifier of the possibility modal intervenes between the negation and the existential quantification over indefinites is spelled out with an FCI.

### 4.2 Predictions and Open Questions

Given the fact that my analysis is based on parallels between the semantics of negative indefinites in negative concord languages (specifically of the strict type) and free choice indefinites in general, there is a direct prediction, at least for Slavic languages, that the same data contrast should be observed whenever strict negative concord is observed.<sup>32</sup>

The following data show just some fragments of a quick preliminary survey I conducted with five native speakers of diverse Slavic languages (one speaker per language) to find out whether my approach is on the right track.<sup>33</sup> Further comparative research and deeper insights into the system of indefinites of given languages are needed for a generalization to be pronounced.

32 Slavic languages display the strict type of negative concord.

33 I would like to thank the following friends for the data from their respective languages: Anton Poludnĕv (Russian), Veronika Richtarčíková (Slovak), Petra Mišmaš (Slovenian), Aleksandra Janić (Serbian), and Zornitsa Tsvetkova (Bulgarian).

### 4.3 Appendix

As you can see in the following examples, the data contrast observed in Czech (and partly in Polish) was confirmed by native speakers for Russian, Slovak, Serbian and Bulgarian as well; compare (a) the examples for the banning of FCIs from negated statements with (b) the examples of their acceptability when a possibility modal is inserted. The situation in Slovenian seems to differ a little. FCIs in negated possibility modal statements are not as well accepted as in the other languages that were examined; see example (26b). There are probably more factors in the Slovenian indefinite system which have to be taken into account.

#### Russian

- (22) (a) Ne prišel # kto-ugodno / # ljuboj čelovek / ✓ ni-kto.  
 NEG came who-FCI FCI person nobody  
 “Nobody came.”
- (b) ✓ Kto-ugodno / ✓ ljuboj čelovek / ✓ ni-kto prijti ne možet.  
 who-FCI FCI person nobody come NEG can-3.SG  
 “Not everybody can come. / Nobody can come.”

#### Slovak

- (23) (a) # Kto-koľvek / # hoci-kto / ✓ ni-kto neprišiel.  
 who-FCI FCI-who nobody NEG-came  
 “Nobody came.”
- (b) Nemôže prísť ✓ kto-koľvek / ✓ hoci-kto / ✓ ni-kto.  
 NEG-can.3.sg come who-FCI FCI-who nobody  
 “Not everybody can come. / Nobody can come.”

#### Serbian

- (24) (a) # Bila ko / ✓ niko nije došao.  
 FCI nobody NEG came-3.SG  
 “Nobody came.”
- (b) ✓ Bila ko / ✓ niko nije mogao doći.  
 FCI nobody NEG could-3SG come  
 “Not everybody could come. / Nobody could come.”

## Bulgarian

- (25) (a) Ne        dojde        # kojto    i da e /    ✓ nikoj.  
 NEG        came.3.SG        who    FCI        nobody  
 “Nobody came.”
- (b) Kojto    ✓ i da e /    ✓ nikoj    ne        može        da        dojde  
 who        FCI        nobody    NEG    can-3.SG    COMPL    came-3.SG  
 “Not everybody can come. / Nobody can come.”

## Slovenian

- (26) (a) # Kdor    koli /    ✓ nihče    ni        prišel  
 who    FCI        nobody    NEG.AUX    came-3.SG  
 “Nobody came.”
- (b) ?? Kdor    koli /    ✓ nihče    ni        mogel        priti.  
 who    FCI        nobody    NEG.AUX    could.3SG    come.INF  
 “Not everybody could come. / Nobody could come.”

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# From Kinds to Objects: Prenominal and Postnominal Adjectives in Polish

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**Abstract:** In this paper I discuss two types of adjectival modification in Polish, namely the semantics of prenominal and postnominal adjectives. I discuss different entailment patterns related to the placement of adjectival modifiers and the relationship between adjectives in both positions and genericity. I postulate a unified intersective semantics for both prenominal and postnominal adjectives and argue that they are predicates denoting properties of objects and kinds respectively. I posit that the kind area is associated with the NP and in the process of semantic composition nouns first combine with postnominal modifiers and then with prenominal ones. The proposal is based on the syntactic analysis of Rutkowski and Progovac (2005) and the semantic framework of McNally and Boleda (2004).

**Keywords:** prenominal adjectives; postnominal adjectives; modification; kinds

## 1. Introduction

It is a well-known fact that Polish allows for both prenominal and postnominal placement of adjectives.<sup>1</sup> Though the syntax of Polish postnominal adjectives has been studied in detail, their semantics has not yet been accounted for from the formal perspective. In this paper I address the puzzle concerning different entailment patterns of adjectival modifiers with respect to their placement. I argue that both prenominal and postnominal adjectives are predicates denoting properties of individuals and have intersective

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<sup>1</sup> I would like to sincerely thank Bożena Cetnarowska, two anonymous reviewers, and the audience at the Olinco 2014 conference for their helpful questions and comments.

semantics. The difference between them lies in the fact that prenominal adjectives are properties of objects, whereas postnominal adjectives are properties of kinds.

The paper is outlined as follows. In Section 2 I review two standard semantic classifications of adjectives, namely a notionally-based typology developed in Bosque and Picallo (1996) and the standard entailment-based typology of Parsons (1970), Kamp (1975), and others. In Section 3 I present novel data from Polish concerning entailment issues related to prenominal and postnominal adjectival modification. I also examine the impact of the placement of adjectives on generic and existential interpretations of the whole NPs in which they appear. In Section 4 I present some theoretical background for the proposal, namely Rutkowski and Progovac's (2005) syntactic analysis of classificatory adjectives in Polish and McNally and Boleda's (2004) treatment of relational adjectives in Catalan as predicates denoting properties of kinds. In Section 5 I propose semantic interpretations for Polish NPs modified by prenominal and postnominal adjectives. Section 6 concludes the paper.

## 2. Semantic Typologies of Adjectives

McNally (forthcoming) distinguishes between three types of adjectival classifications, i.e., morpho-syntactic typologies, notionally-based typologies, and entailment-based typologies. Since this paper focuses on the syntax-semantics interface and does not deal with issues concerning morpho-syntax, for reasons of space I will omit the first classification and I will briefly introduce only the latter two.

### 2.1 Notionally-Based Typologies

Notionally-based typologies classify adjectival modifiers with respect to what could be described as their descriptive content. A classification of adjectives postulated in Bosque and Picallo (1996) could serve as a typical example of such a typology. This account distinguishes between two main classes of adjectives, i.e., qualifying adjectives and relational adjectives. Qualifying adjectives, e.g., *black*, *female*, name properties of entities denoted by the modified noun and express qualities of objects. On the other hand, relational adjectives constitute a class of denominal expressions, e.g., *technical*, *molecular*, which establish the relation between the modified noun and the entity denoted by the nominal root of the adjective.

Within relational adjectives the typology distinguishes between thematic adjectives and classificatory adjectives. Thematic adjectives saturate some thematic role licensed by the modified noun, e.g., the adjective *Russian* in (1a) saturates the Agent role and hence the phrase is equivalent to the NP *invasion by Russia* or *invasion by the Russians*. On the contrary, classificatory adjectives do not saturate any thematic role, but rather classify objects in different domains, e.g., the adjective *Russian* in the example (1b) does not refer to roulette played only by Russians, but rather to a particular type of a game of chance.

- (1) (a) Russian invasion  
 (b) Russian roulette

Since the same adjective can be interpreted either as thematic or classificatory, it is probably more appropriate to speak about thematic and classificatory uses of relational adjectives.

## 2.2 Entailment-Based Typologies

Entailment-based typologies are a different type of classification. Such typologies categorize modifiers with respect to the sorts of inferences they license. Since from the very beginning of formal semantics its essential concern was to account for inference in natural language, typologies of this kind date back to the early works of Parsons (1970) and Kamp (1975) and could be considered the most prevalent in the formal semantics tradition. The standard classification distinguishes between two major classes of adjectives, namely intersective and non-intersective adjectival modifiers. In addition, non-intersective modifiers divide further into subsective and intensional, i.e., privative and modal, modifiers.

The reason why adjectives such as *black* or *lazy* are called intersective is due to the fact that the denotation of the whole NP results from the intersection of sets denoted by the adjective and the modified noun. The general rule for intersective adjectives may be stated in terms of sets as in (2).

$$(2) \llbracket A N \rrbracket = \llbracket A \rrbracket \cap \llbracket N \rrbracket$$

Intersective modifiers follow the entailment pattern in (3) and are traditionally treated as one-place predicates, i.e., expressions of type  $\langle e, t \rangle$ . Since the denotation of the NP *lazy student* is constituted by the intersection of the set denoted by the noun *student* and the set denoted by the adjective *lazy*, it contains entities that at the same time have the property of being a student and the property of being lazy. Therefore, the utterance of (3a) necessarily entails both (3b) and (3c).

- (3) (a) John is a lazy student.  
 (b)  $\models$  John is a student.  
 (c)  $\models$  John is lazy.

However, according to the standard entailment-based typology not all adjectival modifiers appear to be intersective. Adjectives such as *molecular* or *theoretical* are called

subjective, because the denotation of the whole NP does not seem to be an intersection, but rather a subset of the denotation of the noun.

$$(4) \llbracket [A N] \rrbracket \subseteq \llbracket [N] \rrbracket$$

Subjective adjectives do not follow the entailment pattern given in (3). Though (5a) does entail (5b), it definitely does not entail (5c), which may seem somewhat confusing.

(5) (a) John is a theoretical linguist.

(b)  $\models$  John is a linguist.

(c)  $\not\models$  #John is theoretical.

An early and probably the most widely assumed solution to this puzzle (see Siegel 1976) posits that adjectives do not constitute a homogenous semantic class. Instead, intersective adjectives are treated as first-order predicates, i.e., expressions of type  $\langle e, t \rangle$  denoting properties of individuals, whereas subjective adjectives are analyzed as predicate modifiers, i.e., expressions of type  $\langle \langle e, t \rangle, \langle e, t \rangle \rangle$  denoting properties of properties. Hence, although NPs modified by intersective adjectives, e.g., *lazy student*, get the standard semantic interpretation—see (6a)—NPs modified by subjective adjectives, e.g., *theoretical linguist*, are translated as (6b).

$$(6) (a) \llbracket \text{lazy student} \rrbracket = \lambda x[\text{lazy}(x) \wedge \text{student}(x)]$$

$$(b) \llbracket \text{theoretical linguist} \rrbracket = \lambda x[(\text{theoretical}(\text{linguist}))(x)]$$

The undoubted advantage of the predicate modifier approach sketched out above is that it does account for the different entailment patterns in (3) and (5). Nevertheless, as observed in Larson (1998), the problem with this analysis is that it postulates ambiguity for many adjectives, e.g., *formal* in (7a). According to the predicate modifier account the same adjective under the intersective reading—see (7b)—is treated as a predicate and under the subjective interpretation—see (7c)—it is interpreted as a predicate modifier. However, such homophony could be difficult to justify since it is rather undesirable to posit that across languages there are many pairs of syntactically and semantically separate items that happen to have identical phonological realizations and generally appear in the same positions.

(7) (a) John is a formal linguist.



- |     |                     |              |   |                          |
|-----|---------------------|--------------|---|--------------------------|
| (b) | oprogramowanie      | komputerowe  | → | postnominal placement    |
|     | software            | computer-ADJ |   | classificatory adjective |
|     | “computer software” |              |   | subsecutive semantics    |

Examples such as (9a) and (9b) led some researchers, e.g., Rutkowski and Progovac (2005) and Rutkowski (2007; 2012), to generally treat Polish prenominal adjectives as qualifying adjectives and postnominal adjectives as classificatory ones. However, as we will see, the typological distinction between qualitative and classificatory adjectives (or, more precisely, classificatory uses of relational adjectives) should not be confused with the semantic effects resulting from the placement of Polish adjectival modifiers. In fact, it is common that even typical qualifying adjectives such as color adjectives can occur in both positions:

- (10) (a) czarny dzięcioł  
 black woodpecker  
 “black woodpecker”
- (b) dzięcioł czarny  
 woodpecker black  
 “black woodpecker”

Though the lexical semantics of the noun *dzięcioł* (“woodpecker”) and the adjective *czarny* (“black”) in both examples does not differ, the meanings of (10a) and (10b) are not the same. In the predicative position (10a) would refer to a woodpecker whose color is black, whereas (10b) would refer to a representative of the species *Dryocopus martius*. The difference in the interpretation derives from the syntax, specifically the word order, and similar doublets are numerous in Polish. For the rest of this section the phrases from (10a) and (10b) will serve as a litmus test for examining the relationship between the placement of Polish adjectives and such issues as entailment patterns and genericity.

### 3.1 Entailments

Interestingly, the placement of an adjective affects the entailments of the sentence in which it occurs. As one can expect, the veracity of (11a) entails that both (11b) and (11c) are true. When the predicate in (11a) is applied to the entity denoted by the subject, it is predicated that the individual Kajtek belongs to the intersection of the set of all woodpeckers and the set of all black objects.

- (11) (a) Kajtek to czarny dzięcioł.  
 Kajtek this black woodpecker  
 “Kajtek is a black woodpecker (= a woodpecker whose color is black).”

(b) = Kajtek to dzięcioł.  
 Kajtek this woodpecker  
 “Kajtek is a woodpecker.”

(c) = Kajtek jest czarny.  
 Kajtek is black  
 “Kajtek is black.”

Surprisingly, when postposed, even typical intersective adjectives such as color adjectives seem to behave subsectively. The example (12a) does entail (12b), but it does not entail (12c). Thus, if (12a) is true, Kajtek is definitely a woodpecker, but he is not necessarily black. At first glance this fact is difficult to explain in terms of intersectivity and it may suggest that the adjective *czarny* (“black”) in (12a) is not a predicate.

(12) (a) Kajtek to dzięcioł czarny.  
 Kajtek this woodpecker black.  
 “Kajtek is a black woodpecker  
 (= a representative of the species *Dryocopus martius*).”

(b) = Kajtek to dzięcioł.  
 Kajtek this woodpecker  
 “Kajtek is a woodpecker.”

(c) ≠ Kajtek jest czarny.  
 Kajtek is black  
 “Kajtek is black.”

Moreover, although the sentence in (13a) is inherently contradictory and thus extremely awkward, the sentence in (13b) is perfectly fine and it entails that Kajtek is white. This means that the phrase *biały dzięcioł czarny* (“white black woodpecker”) in (13b) should be understood as referring to an albino representative of the species *Dryocopus martius*.

(13) (a) #Kajtek to biały czarny dzięcioł.  
 Kajtek this white black woodpecker

(b) Kajtek to biały dzięcioł czarny.  
 Kajtek this white woodpecker black  
 “Kajtek is a white black woodpecker.”

The data in (11), (12), and (13) may lead to the conclusion that unlike prenominal adjectives that are predicates and have intersective semantics, postnominal adjectives are predicate modifiers with subsective semantics. In this paper, however, I will argue that there is a more appropriate way to account for the puzzling facts described above. Nevertheless, before we outline the theoretical background of the proposal, there is another interesting piece of data that should be taken into consideration.

### 3.2 Genericity

Similarly to bare common nouns, Polish NPs modified by postnominal adjectives can shift freely between existential and generic interpretations. The NP in (14a) is ambiguous and can occur in both existential and generic contexts; see (14b) and (14c) respectively.

- (14) (a) *dzięcioł czarny* → existential reading  
 woodpecker black → generic reading  
 “black woodpecker”

- (b) *Dzięcioł czarny siedział na moim parapecie.*  
 woodpecker black sat-IMPERF on my-LOC parapet-LOC  
 “A black woodpecker was sitting on my parapet.”

- (c) *Dzięcioł czarny wyginął w XXI wieku.*  
 woodpecker black died-out-PERF in 21st century-LOC  
 “The black woodpecker became extinct in the 21st century.”

Interestingly, NPs modified by prenominal modifiers do not show any ambiguity with respect to generic and existential readings and seem to lack generic interpretations; see (15a). Prenominal adjectives in existential contexts such as (15b) are perfectly fine, but sentences like (15c), where the NP with prenominal adjective appears as the argument of the generic predicate, are clearly anomalous.

- (15) (a) *czarny dzięcioł* → existential reading  
 black woodpecker → \*generic reading  
 “black woodpecker”

- (b) *Czarny dzięcioł siedział na moim parapecie.*  
 black woodpecker sat-IMPERF on my-LOC parapet-LOC  
 “A black woodpecker was sitting on my parapet.”

- (c) #Czarny dzięcioł wyginął w XXI wieku.  
 black woodpecker died-out-PERF in 21st century-LOC

Besides the constraints on the distribution of NPs modified by prenominal adjectives presented above, there is one more interesting fact worth consideration. Postnominal adjectives cannot combine with proper names (unless the postnominal adjective is the part of a proper name, i.e., the last name), as can be witnessed by the anomalous phrase in (16b).<sup>4</sup>

- (16) (a) czarny Kajtek  
 black Kajtek  
 “black Kajtek”

- (b) #Kajtek czarny  
 Kajtek black

For reasons of space I will completely omit all the problematic issues concerning modification of proper names, which would probably require some sort of type-shifting to be accounted for. Nevertheless, the contrast between (16a) and (16b) may further suggest that there is in fact some crucial difference between the prenominal and postnominal placement of adjectives with respect to genericity since only adjectives in the prenominal position, where they force the unambiguously existential interpretation of the whole NP, can modify expressions denoting object-level individuals.

The data presented in this section is intriguing, because it shows a clear connection between the placement of adjectives in Polish and two semantic phenomena, namely entailments and genericity. Although the classificatory flavor of postnominal adjectives has already been studied, their puzzling behavior described above has not been observed. In the next section I will develop some theoretical tools that will allow us to account for the semantic properties of Polish prenominal and postnominal adjectives in terms of intersectivity.

#### 4. Theoretical Background

To begin with, there are several preliminary assumptions to be made. First of all, I presume that the intersective semantics for all classes of adjectival modifiers is both possible and desirable. In this paper, however, I will not deal with intensional, i.e., privative and modal, adjectives. Second, I assume that bare common nouns enter the

<sup>4</sup> The # sign in (16b) indicates that the reading on which the adjective is not part of the proper name is unavailable. In writing the difference between these two interpretations is emphasized orthographically by the use of capital letters, cf. #*Kajtek czarny* and *Kajtek Czarny*.

composition ready to denote kinds and that it is legitimate to model kinds as individuals (Carlson 1977). This assumption is mainly motivated by the intuition that kinds seem to be ontologically prior to specimens and by the cross-linguistic fact that in languages allowing for bare NPs they are basically used as generic terms (Krifka 1995). By all means, common nouns can denote sets of object-level entities, technically via the realization relation *R* (Carlson 1977). Third, I assume that the order of the semantic composition of an expression corresponds to its syntactic structure.

#### 4.1 Syntax of Polish Adjectives

In this paper I adopt the so-called ClassP model (henceforth CPM)<sup>5</sup> of the syntax of Polish postnominal adjectival modifiers developed in Rutkowski and Progovac (2005) and Rutkowski (2007; 2009; 2012). The approach in question contributes to the discussion of the universal DP hypothesis by arguing that there are sound reasons to posit a DP structure even in determiner-less languages, e.g., Polish, and to postulate a universal functional head on top of the NP projection.

In the CPM analysis prenominal adjectives are generally treated as qualifying adjectives, while postnominal adjectives are regarded as classificatory adjectives. It should be noted that the distinction is not so clear-cut, as pointed out in Cetnarowska et al. (2011), and that there do exist some NPs such as (17),<sup>6</sup> in which the adjective definitely has a classificatory flavor and at the same time has to surface in the prenominal position. Nevertheless, for the sake of clarity in this paper I will ignore all the intricacies and assume a sharp semantic distinction between prenominal and postnominal adjectives in Polish.

- (17) (a) *boża*            *krówka*  
           *god-ADJ*    *cow-DIM*  
           “ladybird”
- (b) \**krówka*    *boża*  
           *cow-DIM*    *god-ADJ*

According to the CPM approach, the syntactic difference between qualifying and classificatory adjectival modifiers lies in the fact that qualifying APs are merged in functional projections ( $\alpha$ Ps) between the DP and NP, whereas classificatory APs are base generated in the SpecNP and are associated with the strong feature [+class] that has to be checked by the noun. As a result the noun moves to the head of the special projection, being an immediate functional extension of the NP, namely to Class<sup>o</sup> (Rutkowski

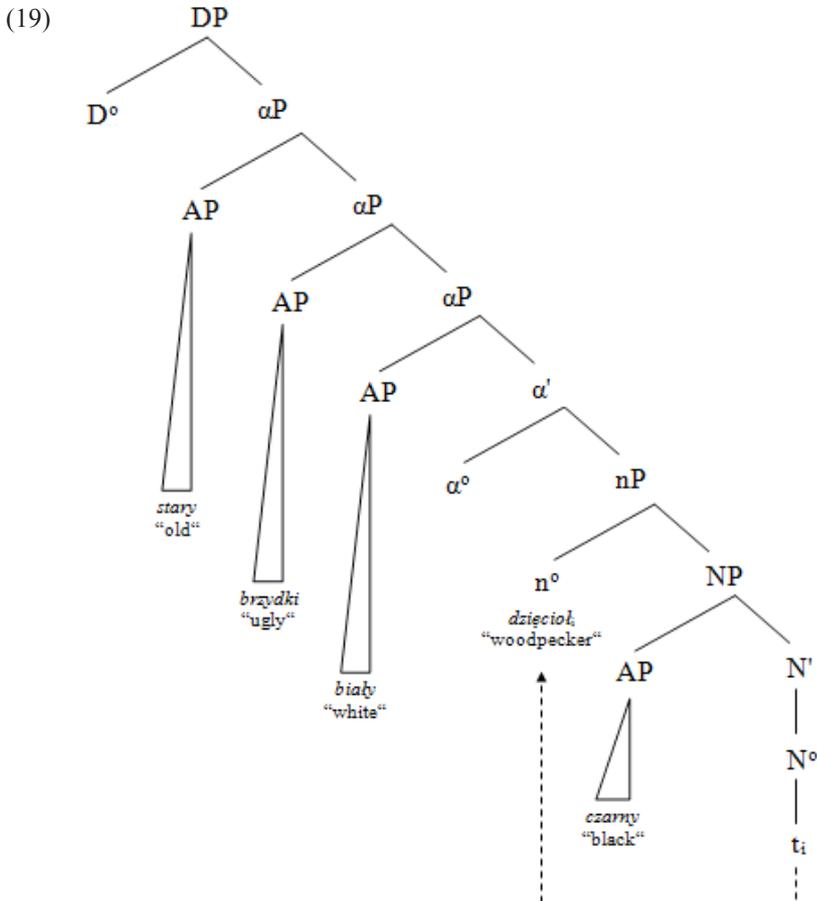
<sup>5</sup> The term was coined in Cetnarowska et al. (2011) and used later on in Linde-Usiekiewicz (2013).

<sup>6</sup> The example is due to Cetnarowska et al. (2011); it is their (14).

and Progovac 2005) or  $n^{\circ}$  (Rutkowski 2007; 2012)<sup>7</sup> and ends up necessarily preceding the classificatory adjective in the surface syntax, as in (18).

- (18) stary brzydki biały dzięcioł czarny  
 old ugly white woodpecker black  
 “ugly old white black woodpecker”

The syntactic derivation of (18) may be illustrated by the phrase marker diagram in (19), which is just an adjustment of Figure (5) from Rutkowski (2012).



7 In the subsequent part of the paper I will follow the labeling from Rutkowski (2007; 2012).

Though iterative projections of qualifying APs are possible and hence there is no limitation on the number of prenominal adjectives, the immediate extension of the NP is unique, i.e., non-recurrent, which results in Polish allowing for only one postnominal, i.e., classificatory, adjective inside the DP.<sup>8</sup> However, what is crucial for the purposes of this paper is the fact that in the structure in (19) it is the postnominal adjective that is closer to the noun than any of the prenominal adjectives. “Being closer” should be understood in the way that the AP projection containing the postnominal adjective is the first branching node that c-commands N<sup>o</sup>.

## 4.2 Composition

One of the main goals of this paper is to argue that despite the apparent differences in entailment patterns both prenominal and postnominal adjectives in Polish are in fact predicates. To justify this claim we need to account for the acceptability of phrases such as (18), or more precisely, its crucial part, repeated here as (20), which seems to be difficult to explain by means of intersective semantics.

- (20) biały      dzięcioł      czarny  
       white   woodpecker   black  
       “white black woodpecker”

For the purposes of the analysis I adopt Heim and Kratzer’s (1998) rule of Predicate Modification generalized to events in Morzycki (forthcoming):

### (21) PREDICATE MODIFICATION (GENERALIZED TO EVENTS)

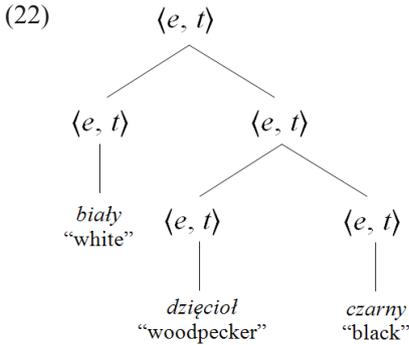
If a branching node  $\alpha$  has as its daughters  $\beta$  and  $\gamma$ , and  $\llbracket\beta\rrbracket$  and  $\llbracket\gamma\rrbracket$  are either both of type  $\langle e, t \rangle$  or both of type  $\langle v, t \rangle$ , then

$\llbracket\alpha\rrbracket = \lambda X. \llbracket\beta\rrbracket(X) \wedge \llbracket\gamma\rrbracket(X)$ , where X is an individual or an event (whichever would be defined).

Of course, Predicate Modification, defined above, is intersective modification and in terms of sets it is equivalent to (2).

<sup>8</sup> Rutkowski and Progovac’s (2005) claim that Polish postnominal adjectives are obligatorily non-iterative is somewhat controversial since there is a relatively small number of examples such as *msza święta żałobna* “lit. mass holy memorial; memorial mass” (Cetnarowska et al. 2011) which seem to be potentially problematic for the analysis that is adopted. In effect, Cetnarowska et al. (2011) and Cetnarowska (2013) propose a different way of accounting for the placement of classificatory adjectives in Polish. Following the representational model of Bouchard (2002), they posit the Linearization Parameter, which determines whether the functor, i.e., the head, precedes or follows its dependent. Since this paper comes up with a different solution, I will not comment further on this issue here. For a detailed discussion see Linde-Usiekniewicz (2013).

Keeping in mind the assumption that the order of the semantic composition corresponds to the syntactic derivation, the structure in (19) posits the following sequence of the composition of the phrase in (20):



The noun first combines with the postnominal adjective, i.e., a predicate of type  $\langle e, t \rangle$ , by Predicate Modification as defined in (21), so the resulting expression is also of type  $\langle e, t \rangle$ , and it is not until then that the composed NP combines with the prenominal adjective. The result of the composition illustrated in the diagram in (22) is the conjunction-based semantics:

$$(23) \llbracket \text{biały dzięciół czarny} \rrbracket = \lambda x[\mathbf{woodpecker}(x) \wedge \mathbf{black}(x) \wedge \mathbf{white}(x)]$$

The formula in (23) could be generalized to all similar structures, as in (24), where  $\mathbf{N}$ ,  $\mathbf{A}_1$ , and  $\mathbf{A}_2$  are predicates corresponding to the meaning of a noun, prenominal adjective, and postnominal adjective respectively.

$$(24) \llbracket \text{AP}_1 \text{ N AP}_2 \rrbracket = \lambda x[\mathbf{N}(x) \wedge \mathbf{A}_2(x) \wedge \mathbf{A}_1(x)]$$

Given that conjunction is commutative and associative, the order of the conjuncts in (23) and (24) in itself does not of course yet explain why the whole NP is a perfectly normal Polish phrase, since the intersection of the sets denoted by the expressions *dzięciół* (“woodpecker”), *czarny* (“black”), and *biały* (“white”) is still necessarily the empty set. As a result the whole phrase should be inherently contradictory and thus semantically anomalous, which is obviously not the case. For the purpose of the proper explanation of this challenging data, we need, though, some more ingredients.

### 4.3 Properties of Kinds

The semantic framework adopted in this paper is McNally and Boleda’s (2004) analysis of relational adjectives in Romance. This approach rejects the standard analysis

of subsectively interpreted adjectives as predicate modifiers denoting properties of properties (Siegel 1976) and argues for their intersective semantics. McNally and Boleda build on standard theories of genericity (e.g., Carlson 1977; Krifka et al. 1995) and Larsonian intersective semantics for event-related adjectives (Larson 1998) to provide a semantic interpretation of Catalan relational adjectives as denoting properties of kinds.

Inspired by Larson's (1998) analysis, McNally and Boleda (2004) postulate that all common nouns have an implicit kind-level argument that gets saturated by a contextually-determined kind and is associated with the object-level argument via the standard Carlsonian realization relation  $R$  (Carlson 1977). In this analysis all common nouns translate as follows:

$$(25) \llbracket \mathbf{N} \rrbracket = \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{N}(x_k)]$$

In the formula in (25)  $\mathbf{N}$  is a predicate associated with the noun, whereas  $x_k$  and  $y_o$  represent individual variables. The superscript  $k$  indicates a kind-level entity, while the superscript  $o$  marks an object-level entity. In other words, the formula in (25) states that objects realize the kind of entities denoted by the common noun.

Furthermore, McNally and Boleda (2004) posit that Catalan relational adjectives are in fact generic predicates, i.e., they denote properties of kinds in a similar way to English adjectives such as *extinct* or *widespread*. Thus, in their analysis APs containing relational adjectives receive the translation as in (26), where  $\mathbf{A}_R$  is a one-place predicate related to the relational adjective.

$$(26) \llbracket \mathbf{AP}_R \rrbracket = \lambda x_k [\mathbf{A}_R(x_k)]$$

Such semantics allows relational adjectives to modify any kind since they can be truthfully applied to any kind-level entity introduced by the modified noun via the composition rule defined in (27):

$$(27) \text{ If noun } \mathbf{N} \text{ translates as } \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{N}(x_k)] \text{ and adjectival phrase } \mathbf{AP} \text{ translates as } \lambda x_k [\mathbf{A}(x_k)], \text{ then } [\mathbf{N} \mathbf{AP}] \text{ translates as } \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{N}(x_k) \wedge \mathbf{A}(x_k)]$$

As a result we obtain a means to preserve the intersective semantics of relational adjectives and at the same time to explain their apparent subsective behavior. The analysis is furthermore justified by the fact that contrary to the predictions formulated by the predicate modifier account, and deceptively corroborated by the awkwardness of examples such as (5c), relational adjectives can be used predicatively provided that the argument of an adjective denotes something related to a kind. This holds not only for Catalan but also for English and Polish, as can be witnessed by the accept-

ability of (28a)–(28c), where the triplet of equivalent sentences in the languages in question is given.<sup>9</sup>

(28) (a) This conference is international.

(b) Aquest congrés és internacional.

(c) Ta konferencja jest międzynarodowa.

With these tools in place, we can now proceed to propose a unified semantics for both prenominal and postnominal adjectives in Polish.

## 5. Proposal

Put informally, the essential idea of this paper is that the closer (in terms of hierarchical structure) to the modified noun the adjective is, the more generic it is. Since Polish postnominal adjectives sit inside the NP, specifically in the SpecNP—see (19)—they combine with the noun earlier and denote properties of kinds. On the contrary, prenominal adjectives are merged in the region between the DP and NP and hence they enter the semantic composition later and denote properties of object-level individuals. It should be noted, however, that it is not the mere proximity of an adjective to the noun that results in the kind or object interpretation, but rather whether it is located inside or outside the NP. In other words, the boundary between the kind and object area is situated in the NP. Everything inside the NP is generic, while the region of  $\alpha$ Ps belongs to the area of objects. As a result of the Carlsonian realization relation  $R$ , both common nouns and NPs modified by postnominal adjectives can shift to the object denotation at any time; however, there is no means for NPs modified by prenominal adjectives to shift their denotation to the sort of kinds.

Following Krifka et al. (1995) and McNally and Boleda (2004), I assume that common nouns enter composition ready to denote kinds, i.e., nominal predicates contain an implicit kind argument; see (25), repeated here as (29a). At the same time, I posit that all Polish adjectives but intensional adjectives are first-order predicates; see (29b). The sort of argument an adjective requires is not defined by its semantics, but rather it results from its placement. APs that are base-generated inside the NP and enter the composition just after nouns require kind-level individuals as their arguments; see (29c). In the surface syntax such APs occur postnominally. On the other hand, APs which are merged higher, i.e., in the region between the DP and NP, enter the composition later and select object-level arguments; see (29d). This is the case of Polish

<sup>9</sup> The examples in (28a) and (28b) are due to McNally and Boleda (2004); they are their (10b). The equivalent Polish sentence in (28c) is mine.

prenominal adjectives. Finally, in the semantic interpretation of phrases with both prenominal and postnominal adjectives such as (20) the order of conjuncts is always as in (29e), i.e., the predicate associated with the postnominal AP ( $\mathbf{A}_2$ ) directly follows the noun and precedes the predicate related to the prenominal AP ( $\mathbf{A}_1$ ).

$$(29) (a) \llbracket \mathbf{N} \rrbracket = \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{N}(x_k)]$$

$$(b) \llbracket \mathbf{AP} \rrbracket = \lambda x [\mathbf{A}(x)]$$

$$(c) \llbracket \mathbf{N AP} \rrbracket = \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{N}(x_k) \wedge \mathbf{A}(x_k)]$$

$$(d) \llbracket \mathbf{AP N} \rrbracket = \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{N}(x_k) \wedge \mathbf{A}(y_o)]$$

$$(e) \llbracket \mathbf{AP}_1 \mathbf{N AP}_2 \rrbracket = \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{N}(x_k) \wedge \mathbf{A}_2(x_k) \wedge \mathbf{A}_1(y_o)]$$

As one can see in (29b), I assume a unified semantics for Polish adjectives (with the probable exception of intensional adjectives) and posit that they always denote properties, but it is the syntax that specifies the sort of properties, i.e., properties of kinds or properties of objects. This accounts for the empirical facts discussed in Section 3.2—see the examples in (14) and (15)—showing that unlike Polish NPs modified by postnominal adjectives that are ambiguous between generic and existential readings, NPs modified by prenominal adjectives have existential interpretations only. Though the realization relation  $R$  can shift the first from the domain of kinds to the domain of objects, the latter cannot go the opposite way, i.e., get the kind denotation.

Let us now discuss the denotation of the Polish noun *dzięcioł* “woodpecker” and the phrases *czarny dzięcioł*, *dzięcioł czarny*, and *biały dzięcioł czarny*, as presented in (10a), (10b), and (20) respectively:

$$(30) (a) \llbracket \text{dzięcioł} \rrbracket = \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{woodpecker}(x_k)](k_j) = \\ = \lambda y_o [R(y_o, k_j) \wedge \mathbf{woodpecker}(k_j)]$$

$$(b) \llbracket \text{czarny dzięcioł} \rrbracket = \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{woodpecker}(x_k) \wedge \mathbf{black}(y_o)](k_j) = \\ = \lambda y_o [R(y_o, k_j) \wedge \mathbf{woodpecker}(k_j) \wedge \mathbf{black}(y_o)]$$

$$(c) \llbracket \text{dzięcioł czarny} \rrbracket = \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{woodpecker}(x_k) \wedge \mathbf{black}(x_k)](k_j) = \\ = \lambda y_o [R(y_o, k_j) \wedge \mathbf{woodpecker}(k_j) \wedge \mathbf{black}(k_j)]$$

$$(d) \llbracket \text{biały dzięcioł czarny} \rrbracket = \\ = \lambda x_k \lambda y_o [R(y_o, x_k) \wedge \mathbf{woodpecker}(x_k) \wedge \mathbf{black}(x_k) \wedge \mathbf{white}(y_o)](k_j) = \\ = \lambda y_o [R(y_o, k_j) \wedge \mathbf{woodpecker}(k_j) \wedge \mathbf{black}(k_j) \wedge \mathbf{white}(y_o)]$$

Following McNally and Boleda (2004), I assume that the noun’s implicit kind argument gets saturated by the contextually-determined kind represented in the formulae by  $k_j$ . McNally and Boleda argue that the kind is uniquely identifiable in the particular context and hence this step is justified. As one can see in (30a), the noun *dzięcioł* denotes a function from object-level entities realizing the kind “woodpecker,” i.e., *Dryocopus*, to truth values, or in other words, the set of objects realizing this kind. The pronominal adjective *czarny* modifies the denotation of (30a) by introducing an additional truth condition concerning object-level individuals. Hence, (30b) represents the set of all objects that are black and that realize the kind *Dryocopus*. This differs crucially from (30c), where the set denoted by the postnominal adjective intersects with the set denoted by the kind, i.e., it is the kind “woodpecker” that has been assigned the property of being black and not necessarily the objects that realize it. As a result, a subkind of the woodpecker is established, namely “black woodpecker,” i.e., *Dryocopus martius*. Therefore, the NP in (30c) denotes the set of all objects realizing the kind *Dryocopus martius*. This accounts for the classificatory flavor of postnominal adjectives, which has not been captured formally until now. Finally, in (30d) it is the postnominal adjective that first combines with the noun to assign the property to a kind-level entity and thus establish the subkind “black woodpecker” and not until then is the resulting expression modified by the pronominal adjective *biały* denoting the property of objects realizing the kind. Hence, the formula in (30d) represents the set of all objects that are white and realize the kind “black woodpecker.” Such semantics predicts that it should be possible to paraphrase (13b), repeated below as (31a), as (31b) and in fact the sentence in (31b) expresses the exact meaning of (13b), stating that Kajtek is an albino representative of the species *Dryocopus martius*.

(31) (a) Kajtek to biały dzięcioł czarny.  
 Kajtek this white woodpecker black  
 “Kajtek is a white black woodpecker.”

(b) Kajtek to biały okaz dzięcioła czarnego.  
 Kajtek this white representative woodpecker-GEN black-GEN  
 “Kajtek is a white representative of the black woodpecker.”

The proposed semantics also explains why the sentence (13a) from Section 3.1 is anomalous. The reason is that since in the NP *#biały czarny dzięcioł* both adjectives occur pronominally, they select object-level entities as their arguments and the intersection of the sets denoted by the expressions *biały*, *czarny*, and *dzięcioł* is the empty set, which results in necessarily tautological truth conditions of any sentence in which the NP were to occur.

An additional argument in favor of the proposed analysis comes from the fact that properties can be assigned to kinds not only by generic predicates such as *widespread* or *extinct*, but also by other predicates, e.g., qualitative adjectives. As can be witnessed in (14), it is possible to use color adjectives predicatively not only with respect to object-level individuals denoted by proper names—see (14a)—but also to kind-level entities denoted by generic terms; see (14b).

(14) (a) Kajtek jest czarny, a Krzyś zielony.  
 Kajtek is black and Krzyś green.  
 “Kajtek is black and Krzyś is green.”

(b) Jeden gatunek dzięcioła jest czarny, A drugi zielony.  
 one species woodpecker-GEN is black and second green.  
 “One species of the woodpecker is black and one is green.”

Hence, it seems that there is nothing in the lexical semantics of adjectives typically characterized as not being generic that would prevent them from combining with kinds. The only constraint is imposed by syntax, i.e., in order to do so they need to occur post-nominally or in post-copular phrases.

According to the standard rule for intersective modifiers given in (2), it appears that Polish adjectives in both positions in question are in fact intersective. The different entailment patterns in (11) and (12) result from the fact that they select arguments of different sorts. Since postnominal adjectives denote properties of kinds, (12a) cannot entail (12c) simply because the adjective *czarny* (“black”) in the postnominal position says nothing about the property of the particular object-level individual realizing the kind denoted by the noun.

## 6. Conclusion

In this paper I have dealt with the problem concerning different entailment patterns of prenominal and postnominal adjectives in Polish. I have presented novel data showing that while NPs modified by postnominal adjectives are systematically ambiguous between generic and existential readings, NPs modified by prenominal adjectives get existential interpretations only. I have argued that all Polish adjectives except intensional ones are predicates and as such denote properties of individuals and have intersective semantics. Nevertheless, their placement has an impact on whether they take object-level or kind-level arguments. According to my proposal, since postnominal adjectives sit inside the NP, they combine with the noun first and denote properties of kinds, whereas prenominal adjectives, merged in the area above the NP, enter the semantic composition later and denote properties of objects. This explains the supposed subjective behavior of postnominal adjectives and the acceptability of phrases such as

*biały dzięcioł czarny* (“white black woodpecker”) that seemed to be challenging for the intersective account.

The analysis presented in this article gives an explanation for the Polish data; however, an obvious question arises: how are we to account for the cross-linguistic variation in the placement and interpretation of adjectives within the proposed framework? Answering such a question would certainly lead far beyond the scope of this paper and hence the extension of the idea developed here has to be left for future investigation.

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# The Nominal Non-Phase: How the Study of Polish Nominals Contributes to Phase Theory

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**Abstract:** The main objective of this paper is to analyze the status of nominal phrases in Polish as phases as well as to account for the feature distribution within nominals. On the basis of numerically quantified phrases and the heterogeneous syntax of higher numerals, it is proposed that the spell-out of the complement domain of the nominal phrase cannot be subsumed under the standard application of Chomsky's *Phase Impenetrability Condition* as it would leave the valuation/checking of case features on all nominal elements unexplained. Thus, the idea of a delayed spell-out along with the implementation of a procedure of feature sharing as put forward by Danon (2011) and Pesetsky and Torrego (2007), enhanced with the split Case Phrase (cf. Čaha 2009), provide a contribution to the discussion on nominal phrases as phases and reveal the intricacies of the syntax of the Genitive of Quantification in Polish.

**Keywords:** phase theory; nominal projections as phases; countercyclicity; Genitive of Quantification; numerals.

## 1. Introduction

In the study of nominal phrases, one of the debatable issues is their phasal status (cf. Matushansky 2005, Citko 2014, Bošković 2012, among others) as well as the spread of case and  $\phi$ -features within the nominal projection. In this paper we take up a discussion of nominal phrases as phases and elaborate on the distribution of formal features with the example of Polish nominal, putting a special emphasis on the Genitive of Quantification.

As a starting point for our analysis we take a closer look into the application of the *Phase Impenetrability Condition* (PIC) to the nominal domain, especially in those cases in which every element of a nominal phrase is morphologically marked for case, so in situations showing that the complement domain of the top functional head within the nominal projection, i.e., TNP (Traditional Noun Phrase), must be accessible to operations of narrow syntax at the stage of the derivation when the nominal phrase and the probe are merged (Section 2). In Section 3 we provide data from Polish demonstrating that the morpho-syntax of Polish TNPs poses a substantial challenge to the view that the maximal nominal projection is a well-behaved phase, due to the problem of counter-cyclicity that emerges considering the internal distribution of case within nominals quantified by cardinal numerals. Consequently, it is proposed that instances of counter-cyclic derivations are justified and thus admissible provided that they occur within the “live” window of a single phase. In the subsequent part (Section 4) we focus on case and feature concord within TNP. Utilizing the idea of a feature sharing mechanism as proposed by Danon (2011) and Pesetsky and Torrego (2007) along with the introduction of the structure of nominals containing a *Kase Phrase* (KP) split into particular case projections (based on Caha 2009), we not only account for the valuation and interpretation of features on particular constituents of a nominal phrase, but also offer an analysis of the heterogeneous syntax of numerically quantified phrases as well as an explanation for why Genitive appears in these contexts.

## 2. The Phase Impenetrability Condition and Polish Nominals

In the theory of phases in Chomsky (2000; 2001; 2008), chunks of the structures are handed over via spell-out to one of the interfaces. The procedure of sending information to PF or LF has been constrained via the so-called *Phase Impenetrability Condition* stating that upon the completion of a single cycle, the phase, the complement domain is no longer available for further computation as it has already been transferred to the phonological component (cf. a definition of PIC in [1]):

### (1) *Phase Impenetrability Condition*

In phase  $\alpha$  with head H, the domain of H is not accessible to operations outside  $\alpha$ , only H and its edge are accessible to such operations (Chomsky 2000, 108).

Interpretation/evaluation of phase  $\alpha$  takes place uniformly at the next higher phase, i.e.,  $Ph_1$  is interpreted/evaluated at the next relevant phase  $Ph_2$  (Chomsky 2001, 13).

The definition in (1) can be depicted with the example in (2) in which the complement domain of TNP is not subject to the process of case feature valuation once the nominal enters into the relation with a v-V complex, e.g.:

$$(2) \quad v\text{-}V_{\{+\phi\}} \rightarrow [{}_{\text{TNP}} Q_{\{+\text{acc}\}} [{}_{\text{NP}} N]]$$

The example shown in (2), although in accordance with PIC, runs counter to data found in Polish which clearly indicate that not only the phasal head but also its minimal domain are within the reach of the external selector, i.e., T or v-V. The fact that in Polish every element of a nominal phrase is morphologically marked for case, e.g., (3b), reveals that instead of (2) in which only the edge of the phase participates in the operation Agree with the v-V probe, the situation described in (4) holds.

|         |              |           |             |                |
|---------|--------------|-----------|-------------|----------------|
| (3) (a) | Te           | trzy      | szybkie     | biegaczki      |
|         | these-NONVIR | three-FEM | fast-NONVIR | runners-NONVIR |

|         |      |        |          |             |
|---------|------|--------|----------|-------------|
| (b) NOM | te   | trzy   | szybkie  | biegaczki   |
| ACC     | te   | trzy   | szybkie  | biegaczki   |
| GEN     | tych | trzech | szybkich | biegaczek   |
| DAT     | tym  | trzem  | szybkim  | biegaczkom  |
| INST    | tymi | trzema | szybkimi | biegaczkami |
| LOC     | tych | trzech | szybkich | biegaczkach |

$$(4) \quad v\text{-}V_{\{+\phi\}} \rightarrow [{}_{\text{TNP}} Q_{\{+\text{acc}\}} [{}_{\text{NP}} N_{\{+\text{acc}\}}]]$$

Valuation of Accusative on the numeral and the noun, represented in (4) as Num and N respectively, instantiates the case in which the complement domain to TN takes part in morpho-syntactic relations and remains “alive.” Such a spread of case and  $\phi$ -features raises questions on the applicability of the PIC in its strict reading and the phase status of the TNP in Polish.<sup>1</sup>

### 3. Countercyclicity and Non-Phases

Some further evidence for the active complement domain upon the merger of the external probe comes from the Genitive of Quantification. In Polish (and Russian) numerically quantified phrases display interesting morphosyntactic properties when the noun is modified by numerals 5 and higher.<sup>2</sup> Whenever the phrase occurs in a position in which one of the structural cases is assigned, i.e., Nominative or Accusative, the noun is always marked as Genitive, e.g., (5):

1 We make a crucial assumption concerning case assignment/valuation: for all the cases, both structural and inherent, case is assigned/valued by the complete amalgamated verbal head v-V, at the vP level. We follow in the footsteps of Lasnik (1995), where (inherent) partitive case is assigned in an identical syntactic configuration to (structural) accusative, that is [spec, Agr<sub>o</sub>-V].

2 Serbo-Croatian also shows the Genitive of Quantification but its morpho-syntactic nature is different (see Franks 1994; 1995 for an analysis).



the edge position of TNP, i.e., the quantifier, has been established. Such timing of case assignment may serve as evidence for the default nature of Genitive; more specifically, that it is assigned to the complement of the higher quantifier by a default procedure in the PF component of grammar as soon as the quantifier finds itself in the Agree relation with a T or v head. Although that might be a plausible scenario for Genitive of Quantification, some sub-extraction facts in Polish show that Genitive case on the nominal complement to Q is not a default case assigned by the morphological component of grammar on the PF branch as part of a spell-out procedure, e.g.,

- (8) (a) *te* *siedem* *aktorek*  
these-ACC.NONVIR seven-ACC.FEM actresses-GEN.NONVIR  
“these seven actresses”
- (b) *tych* *siedem* *aktorek*  
these-GEN.NONVIR seven-ACC.FEM actresses-GEN.NONVIR  
“these seven actresses”
- (c) *siedem* *tych* *aktorek*  
seven-ACC.FEM [these actresses]-GEN.NONVIR  
“these seven actresses”
- (d) *tych* *spotkałem* *wczoraj*  
these-GEN.NONVIR met-1SG.PAST yesterday  
[<sub>TNP</sub> *tych* *siedem* *aktorek*]  
these-GEN.NONVIR seven-ACC.FEM actresses-GEN.NONVIR
- (e) *tych* *siedem* *spotkałem*  
these-GEN.NONVIR seven-ACC.FEM met-1SG.PAST  
*wczoraj* [<sub>TNP</sub> *tych* *siedem* *aktorek*]  
yesterday these-GEN.NONVIR seven-ACC.FEM  
actresses-GEN.NONVIR

The pre-quantifier, the demonstrative pronoun preceding the QP in (8), can either appear in a case congruent with the quantifier, say Accusative (in the position before Q), e.g., (8a), or in a case congruent with the NP complement to Q (both in a pre- and post-Q position), e.g., (8b–c). We take these facts to show that the demonstrative is raised from a position within the minimal domain of N to a position at the edge of TNP. From the point of view of phase theory, the NP complement to Q cannot be removed from the live window of the derivation and sent to PF to receive default case



(10) C [ T [ John [v\* [V who]]]]

The head C bears both the edge feature (*wh*) and the Agree feature, which it transfers to the head T, together with the EPP property. Again, the PIC forces raising of *who* to the outer [spec,v]. Next, two operations apply in parallel: while the Agree feature of C-T accesses *John* to move it to [spec,T], the edge feature of C accesses the object *who* and moves it to [spec,C]. Since both operations take place within the same phase and are in fact driven by probes originating at the same locus (the phase head C), no MLC violation issue arises and the countercyclicality is only apparent.

In conclusion, we submit that countercyclicality is tolerated as long as the countercyclic operation is contained within one phase. Our account of the licensing of the TNP internal Genitive case also involves movement operations which are only apparently countercyclic: they happen within the TNP before it is established as a phase at the derivational stage of building vP.<sup>4</sup>

#### 4. Case and $\Phi$ -Feature Concord within TNP

In this section we show that a delay in the spell-out of nominal projections, argued for above, is also justified by the TNP internal feature spread.

Another relevant aspect discussed in the context of nominals is the issue of feature distribution within the nominal phrase, especially in reference to the phase theory and the PIC. The topic of concord between the constituents of the noun phrase has been raised, for instance, by Danon (2011), who emphasizes the idea that particular  $\phi$ -features are located on separate heads within nominals and their valuation proceeds via the mechanism of feature sharing.<sup>5</sup>

Taking into account the nature of the Agree relation, i.e., that it is instantiated between a  $\phi$ -complete T/v and a DP bearing interpretable  $\phi$ -features which leads to the valuation of case feature on the DP and uninterpretable  $\phi$ -features on T/v, Danon (2011, 299) states that the highest nominal head must be  $\phi$ -complete, as otherwise it could not value the  $\phi$ -features on finite T/v and for all intents and purposes it would behave like an expletive, i.e., only its person feature would become valued and deleted by T as the agreement relation requires a complete set of phi-features. The phi-features on T, to be valued and deleted, would have to enter a relation with another element that is phi-complete. Moreover, on the basis of Walloon and Finnish, he demonstrates that gender

4 There is ample evidence collected in Matushansky (2005), Svenonius (2004), Marušić (2005; 2009), and Citko (2014) showing that maximal nominal projections are phases, at least on the PF interface.

5 In some other accounts of concord within nominal projections, e.g., in Carstens (2000), the system of feature checking of Chomsky (1995) has been implemented with a critical review of an early version of the probe/goal system of Chomsky (2000). For details cf. Carstens (2000) and works cited therein.

and number features show on DP internal positions distinct from the top one, that is D. As a result, Danon (2011) concludes that the set of  $\varphi$ -features is distributed between at least three heads internal to TNP, e.g.:

(11) The DP-internal distribution of the nominal  $\varphi$ -feature set:

|            |                      |                     |                     |
|------------|----------------------|---------------------|---------------------|
| <b>Det</b> | [ <sub>i</sub> pers] | [ <sub>u</sub> num] | [ <sub>u</sub> gen] |
| <b>Num</b> | [ <sub>u</sub> pers] | [ <sub>i</sub> num] | [ <sub>u</sub> gen] |
| <b>N</b>   | [ <sub>u</sub> pers] | [ <sub>u</sub> num] | [ <sub>i</sub> gen] |

However, such a feature spread, as depicted in (11) and (12), inevitably leads to a situation in which the  $\varphi$ -set, in the process of feature valuation, is left incomplete at the level of DP.

(12) [<sub>DP</sub> Det<sub>{<sub>i</sub>pers, u\_num, u\_gen}</sub> [<sub>NumP</sub> Num<sub>{<sub>u</sub>pers, i\_num, u\_gen}</sub> [<sub>NP</sub> N<sub>{<sub>u</sub>pers, u\_num, i\_gen}</sub> ]]]

In consequence, if DP is a phase and valued uninterpretable features are deleted at the phase level, the number and gender features are deleted at the level of the maximal projection of D and D is  $\varphi$ -incomplete. Furthermore, even if the PIC allowed for the penetration of the internal domain of D by the T/v probe reaching for {<sub>i</sub> num} on Num and {<sub>i</sub> gen} on N, the undeleted, thus still visible, valued uninterpretable number and gender features on D should cause an intervention effect. For a solution, Danon (2011) looks towards the notion of feature sharing suggested in Frampton and Gutmann (2006) and Pesetsky and Torrego (2007), whereby all the features of the  $\varphi$ -set are shared at the DP level.

Drawing on Brody (1997), Pesetsky and Torrego (2007) propose a substantial redefinition of the notion and procedure of feature valuation. In the place of the standard minimalist definition presented in (13) they propose (14):

(13) Agree (Assignment version; Chomsky 2000, 2001)

- (a) An unvalued feature F (a probe) on a head H scans its c-command domain for another instance of F (a goal) with which to agree.
- (b) If the goal has a value, its value is assigned as the value of the probe.
- (c) A feature F is uninterpretable if F is unvalued.  
Once an uninterpretable feature is valued, it can and must delete.

(14) Agree (feature sharing version)

- (a) An unvalued feature  $F$  (a probe) on a head  $H$  at syntactic location  $\alpha$  ( $F_\alpha$ ) scans its c-domain for another instance of  $F$  (a goal) at location  $\beta$  ( $F_\beta$ ) with which to agree.
- (b) Replace  $F_\alpha$  with  $F_\beta$ , so that the same feature is present in both locations.

The crucial difference between these versions of Agree is that the interpretability and valuation of features is a biconditional relation in Chomsky's system, but viewed as independent in a feature sharing mechanism, i.e. the interpretation is strictly linked with valuation in the former, whereas Pesetsky and Torrego allow for the existence of probes with unvalued but interpretable features (cf. the feature classification in [16]). Moreover, once the feature is valued, it is deleted and there is no longer a link between the feature that received value and the one that provided it. In Pesetsky and Torrego's proposal, on the other hand, when *Agree* is established between a feature  $F$ , the probe, at a syntactic location  $\alpha$  and a feature  $F$ , the goal, at the syntactic location  $\beta$ , what we obtain is a single feature  $F$  shared by two locations: hence, agreement is feature sharing. Furthermore, the feature sharing version of Agree implies that two or more elements may share the same unvalued feature (they are multiple instance of the same unvalued feature) which is still subject to valuation by a valued occurrence. A relation between two occurrences of the same unvalued features in a c-command relation is not vacuous but turns them into two instances of the same feature occurrence. Ultimately, one of the instances of the unvalued feature is bound to find itself in the c-command domain of the valued feature. At this point the notion of Agree by sharing implies that the value of the valued feature will spread onto every instance, e.g., (15):<sup>6</sup>

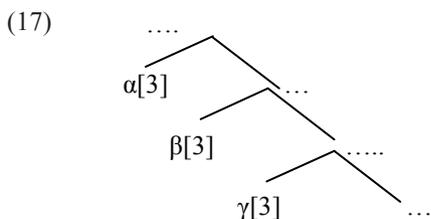
$$(15) \dots F_\alpha [ ] \dots F_\beta [ ] \dots F_\gamma \text{ val } [ ] \rightarrow \dots F_\alpha [3] \dots F_\beta [3] \dots F_\gamma \text{ val } [3]$$

Pesetsky and Torrego submit the following feature classification, which the standard minimalist Chomskyan system would disallow, cf. (16a) and (16d). What is more, they follow Brody's (1997) *Thesis of Radical Interpretability*, according to which each feature must receive a semantic interpretation in some syntactic location.

6 Pesetsky and Torrego use the term *occurrence* (of feature  $F$ ) to refer to distinct features that might undergo Agree. It can be valued or unvalued, e.g.,  $F_\alpha [ ]$  or  $F_\gamma \text{ val } [ ]$  respectively. The term *instance* (of feature  $F$ ) is used to indicate a feature-pair location, i.e., a particular feature that has undergone Agree. After Agree applies a feature has more than one instance. A notation used to indicate the instance of feature  $F$  is  $F_\alpha [3]$ .

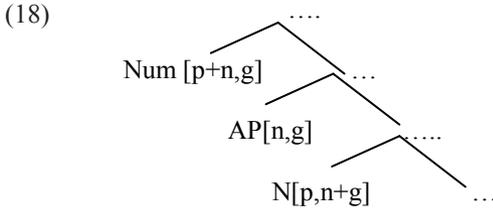
- (16) (a) {uF, val}    uninterpretable, valued
- (b) {iF, val}    interpretable, valued
- (c) {uF, [ ]}    uninterpretable, unvalued
- (d) {iF, [ ]}    interpretable, unvalued

Thus what deletes at the LF interface is not the feature but instances of the feature in uninterpretable positions. Danon (2011), following in the footsteps of Pesetsky and Torrego, proposes that all the features of the  $\phi$ -set should be shared at the DP level, on the assumption that they are all instances of feature values, e.g., (17):



This mechanism forms the foundation of the account of  $\phi$ -feature (and case) concord on TNP internal adjectives (AP), adjectival possessives, and demonstratives. Assume that these elements are interspersed between heads  $\alpha$ ,  $\beta$ , and  $\gamma$  in (17), so that one of these heads c-commands them. As each head is equipped with a full set of  $\phi$ -features (of which at least one is valued and interpretable but the others are not), it functions as a probe that gets involved in an Agree relation with the APs and other modifiers. Even if the resulting Agree relation does not match a valued and unvalued instance of a particular feature, it is sufficient to establish a dependency, turning feature occurrences into one chain of feature instances, within which each feature must have a valued and an interpretable instance. We assume that the heads N, Number, and the top projection in the nominal, call it TN, all share features of person, number, and gender, but the feature [+gender] is interpretable on N, the feature [+number] on Num, and the feature [+person] on TN. Consider the example below, i.e., (18), where an adjective is placed in a position between two heads of the nominal complex, Num and N. The AP overtly inflects for number and gender, which we take to be uninterpretable and unvalued. Without the assumptions concerning feature sharing, its position would render it a problematic goal for N, the target probe for the gender feature, as N does not c-command AP. But due to the feature sharing approach this problem dissolves, as Num and N (as well as Det) share all the set of  $\phi$ -features, meaning that whichever head

shares the set can act as the probe—provided, of course, that at some structural location a feature instance in the shared set bears a value and is interpretable. In others words, the head Num c-commanding AP acts as a proxy for N as far as the gender feature is concerned. Example (18) shows a partial representation of a nominal phrase in which only phi-features undergo Agree. The continuation of the discussion on feature sharing involving case is presented in (22).



We endorse this feature sharing mechanism, at least for languages overtly displaying case feature spread within the maximal projection of the nominal, e.g., Polish:

- (19) te                                    trzy                                    szybkie                                    biegaczk  
 [these-NONVIR    three-FEM                    fast-NONVIR                    runners-NONVIR]-NOM  
 “these three fast runners”

Possibly, the heads within the TNP should on this account share its case feature value with the TNP-external probe.

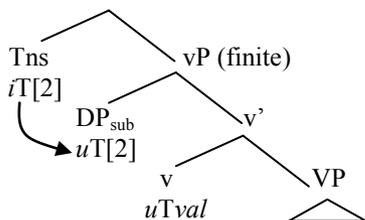
Pesetsky and Torrego clearly assume that the value of the feature is equivalent with its morphological manifestation, while the interpretation of a given feature is provided at a functional head. Now, if Nominative case is the nominal equivalent of T, it is morphologically manifested through (zero) inflection within the DP and through suffixation on the lexical verb. We take this double well-formedness requirement on chains of feature instances to constitute one of the basic conditions of morphosyntax, cf. (20):

- (20) Each well-formed chain of feature instances X includes one instance of feature X with a value and one instance of feature X in an interpretable position.

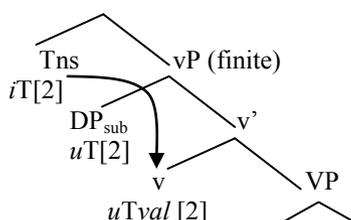
The exemplary derivation of a finite sentence depicted below demonstrates how the feature sharing mechanism leads to valuation and deletion of particular features. The interpretable but unvalued feature T on the functional head T(ense), i.e., *t*T [], searches for the appropriate goal. Eventually, it enters into Agree with a DP subject which has

uninterpretable and unvalued T feature, i.e.  $uT []$ .<sup>7</sup> Yet, as both features on the probe and goal are unvalued, the two instances of T feature are unvalued, e.g., (21) Step 1. Still, the link between them has been established. As the next step, i.e., Step 2 in (21),  $iT []$  probes for another goal and consequently enters into Agree with the valued but uninterpretable T feature on the finite verb,  $uT val$ .<sup>8</sup> This agreement relation has not only led to the valuation of a T feature on a functional head T, but also, due to the earlier relation between Tense and DP, on the nominal subject.

(21) Step 1: *Agree with subject*  
(no valuation)



Step 2: *Agree with finite verb*  
(valuation occurs)



Now, returning to the discussion of nominal phrases, let us assume a more articulated internal structure for TNP, with a separate level for a Kase Phrase. Within the derivation of TNP, repeated applications of external Merge form the following object:

$$(22) [_{KP} K_{u+c} [_{NumP} Num_{u-c} [_{nP} n_{u-c} [_{NP} N_{u-c} ]]]]]$$

Although the valued feature on K can pass on its value to other instances of the feature c (case), these instances cannot yet delete, as the chain does not meet the condition in (20), because none of the instances of the feature c (case) finds itself in an interpretable position.

We introduce a significant modification to what Danon and Pesetsky and Torrego have to say about feature sharing; we claim that just like features can have the EPP property, forcing overt operations (Pesetsky and Torrego 2001), they can also have the property [+/-share]. That is, as a default option the features within the extended projection of the nominal, including [case], have a property [+share] that converts feature occurrences into multiple instances of the same feature. Yet, it may be possible to stop feature sharing if one instance should have the [-share] property.

In the context of the condition in (20) above, one should inquire how a case feature can ever be interpretable. Perhaps it is not interpretable on the nominal projection but

7 Structural case is viewed as an uninterpretable feature T on D (Pesetsky and Torrego 2001; 2004).

8 A T feature on a verb is valued in the lexicon.



As for inherent case, it also substantially contributes to the interpretation at LF, as it spells out thematic roles. In this respect, a radical position is adopted in Boeckx and Hornstein (2006) and Bošković (2006), who argue for a very strong connection between inherent case and thematic roles, i.e., inherent case is a manifestation and morphological realization of the assignment of a given thematic role. In a weaker version, it is stated that case features are conducive to  $\theta$ -role assignment, therefore indirectly interpretable (Chomsky 1981, 179):<sup>10</sup>

- (24) Suppose that  $\alpha$  has the A-function chain ( $GF_1, \dots, GF_n$ ) and that  $\beta^i$  is the element bearing  $GF_i$ . Then a chain is assigned a  $\theta$ -role only if for some  $i$ ,  $\beta^i$  has features. (Specifically,  $\beta^i$  may have the features of PRO, or it may have Case [and must have Case by the Case Filter if it is phonetically realized]).

On the strength of (24), case marking facilitates semantic interpretation of nominal arguments; case is helpful for thematic interpretation, thus LF-interpretation in general. We submit that lexical case is assigned by the complete verb ( $v$ -V), and borrowing from Chomsky (2008) we propose that the phase head of the verbal complex  $vP$ ,  $v$ , hands down its case features, including lexical case, to V, so that this head is the holder of the  $\{_{i,c}\}$  feature, an interpretable but unvalued case feature. This proposal is a technical implementation of the intuition that the verbal predicate discharges the thematic role and in many instances it is connected with a particular case:

- (25) [<sub>vP</sub> v [<sub>vP</sub> V<sub>i-c</sub> [<sub>KP</sub> K<sub>u+c</sub> [<sub>NumP</sub> Num<sub>u-c</sub> [<sub>nP</sub> n<sub>u-c</sub> [<sub>NP</sub> N<sub>u-c</sub> ]]]]]]]

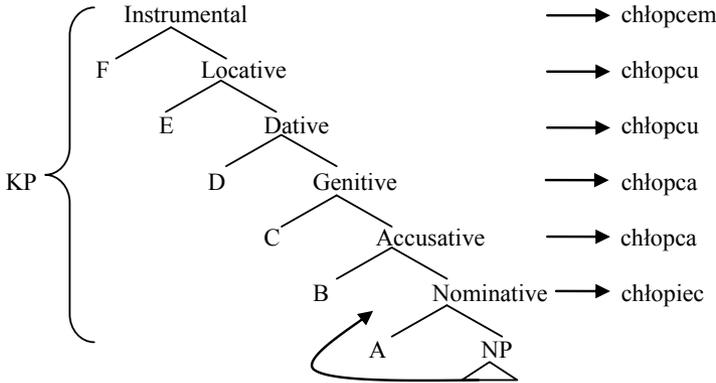
The instance of the case feature on V is unvalued, hence V is a legitimate probe; it receives its value from other valued instances, but as it is interpretable, it provides the chains of case feature instances with an interpretable position and makes them legitimate. A pivotal property of our proposal is that a projection of the nominal phrase will not be spelled out before its verbal selector/case marker is merged into the syntactic object under construction. The chain of case feature instances within the nominal projection finds its value internal to TNP. Yet, it cannot be spelled out, as another dimension of the feature chain is missing: the feature interpretation (cf. 20).

In the final part of this contribution we would like to inspect closely what happens internal to the Case Projection, how valued case features get onto the nominal and its satellites, and why Genitive is the default case. Building on the ideas of Starke (2009)

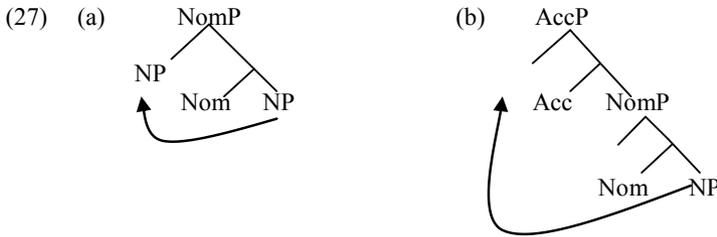
10 The same point is strengthened in Chomsky (1986, 135), i.e., A CHAIN is case-marked if it contains exactly one Case-marked position; a position in a Case-marked chain is visible for  $\theta$ -marking.

and Caha (2009), we assume that in Polish the lower part of the nominal projection is dominated by the KP split into particular case projections, e.g., (26).<sup>11</sup>

(26) Case hierarchy in Polish on the basis of a noun *chłopiec* “a boy”



Every element that is nominal in nature possesses a [+N] feature, so the noun and its modifiers acquire a case value in the course of a derivation by movement to a position c-commanding case and in compliance with Cinque’s (2005) restrictions on movement, i.e. movement must be leftward and a moving constituent must contain a head-noun, e.g., (27):

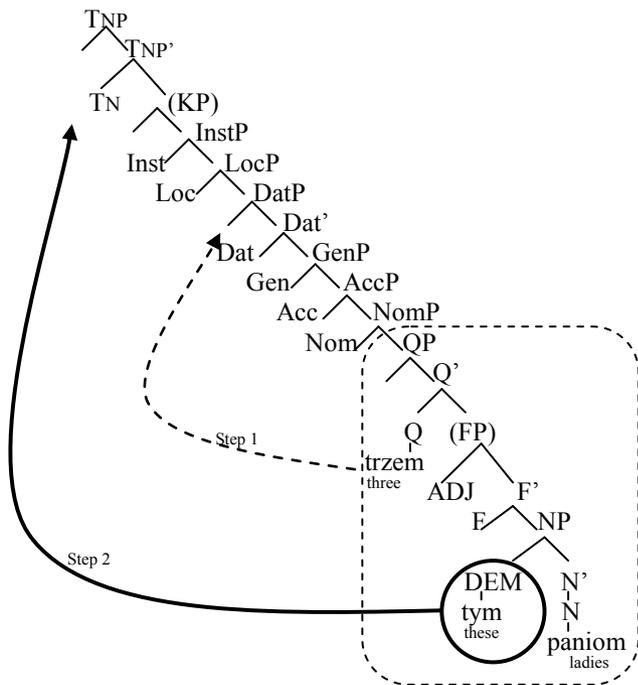


Now, particular case areas in the KP are activated upon exposure to external probes. In the exemplary derivation of *tym trzem paniom* ([these three ladies]<sub>-DAT</sub>), once the external selector, for instance a verb or a preposition imposing Dative on its argument, merges with the extended nominal projection, the whole phrase moves to the specifier of Dative Phrase (DatP), which is presented as *Step 1* in example from Polish, i.e., (28). Technically,

<sup>11</sup> The hierarchy of cases in Polish is based on the morphological complexity of cases, i.e., Nominative has been the most unmarked case and Nominative and Accusative as core cases are set apart from oblique ones which are usually morphologically more complex (Caha 2009, 23). Another criterion considered is the prevailing syncretism of particular cases, i.e., Locative with others, which is obtained among adjacent cases.

once an external selector activates a particular case head it also forces the EPP property to it. The movement of [<sub>QP</sub> [trzy [<sub>FP</sub> [ F [<sub>NP</sub> te [panie ]]]]]] to the specifier of DatP provides all elements with Dative. The subsequent movement of a demonstrative to the specifier of TN ensures the right word order, i.e., demonstrative-numeral-noun. The escape movement of a demonstrative to [spec,TN] is presented as *Step 2* in (28).<sup>12</sup>

(28) PreP/V



Now, returning to the case of Genitive of Quantification and the proposal of a delayed spell-out, the nominal phrase (TNP) after being selected as an argument is accessed by a probe, T or v-V, and the relation Agree/feature sharing is established between the nominal and the external selector. The phrase, i.e., QP, moves to a position within KP to get a case value imposed by the external head, e.g., finite T makes a QP move to [spec,Nom], and v-V to [spec,Acc], as the level of Nom or Acc respectively gets activated and bears the [+EPP] property. When the nominal phrase contains a higher numeral and the noun is in Genitive, two rounds of movement within KP are necessary, i.e., one of the

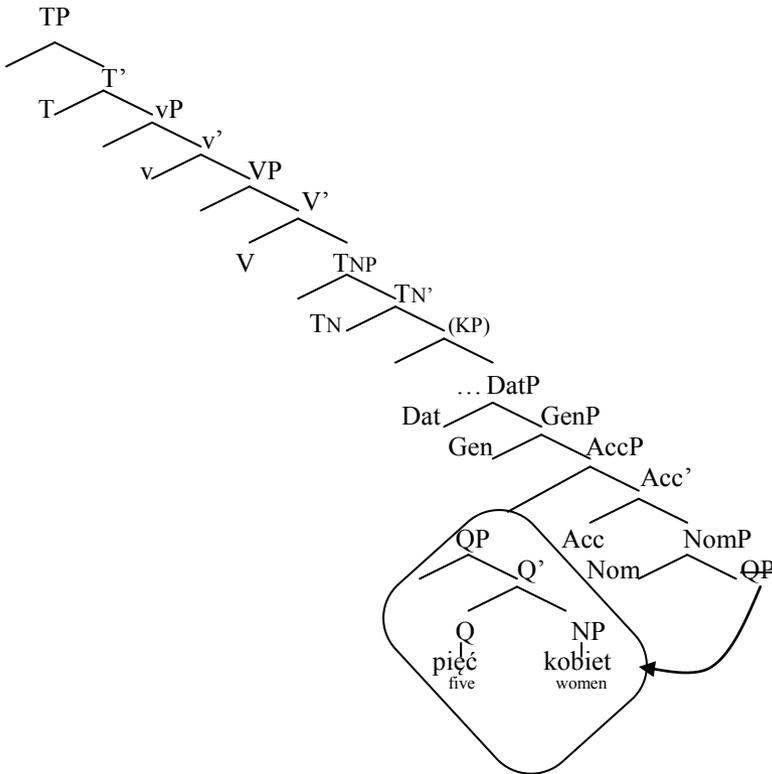
12 As for the unused case shells, we propose that once at least one *Kase Phrase* in the KP is used then the remaining ones become irrelevant for further computation at the point of spell-out, i.e., once the probe is introduced, e.g., T, it activates NomP, triggering movement of a noun (and its modifiers if they are present) to [spec,NomP], rendering the rest of case projections irrelevant for further computation.

whole phrase to the position dictated by the external selector, e.g., (30a), and one more ensuring Genitive on the quantified noun, e.g., (30b). This is caused by the fact that higher numerals ( $Q_h$ ) are defective Qs, in that whenever they are accessed by the Nominative or Accusative Probe they sever the feature sharing mechanism for the [+case] feature, e.g.:<sup>13</sup>

(29)  $Nom/Acc \rightarrow Q_{h[-share\ case]}$

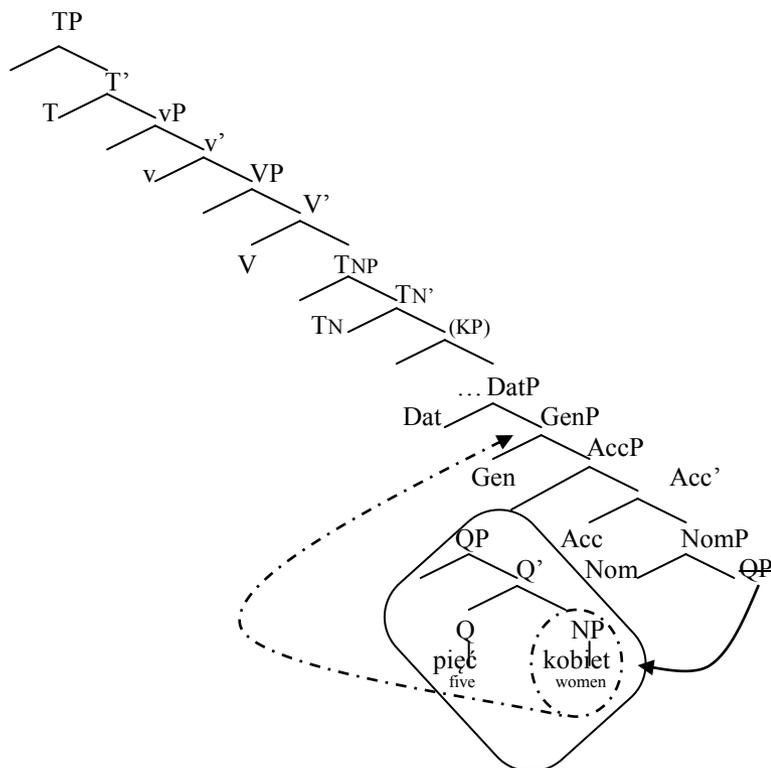
The subsequent movement of the complement of Q to [spec,Gen] has a last resort flavor, as other elements bearing the [+case] feature need to have it valued and interpreted:

(30) (a) Step 1 : movement of the QP to [spec,AccP] as required by the selector, i.e., v



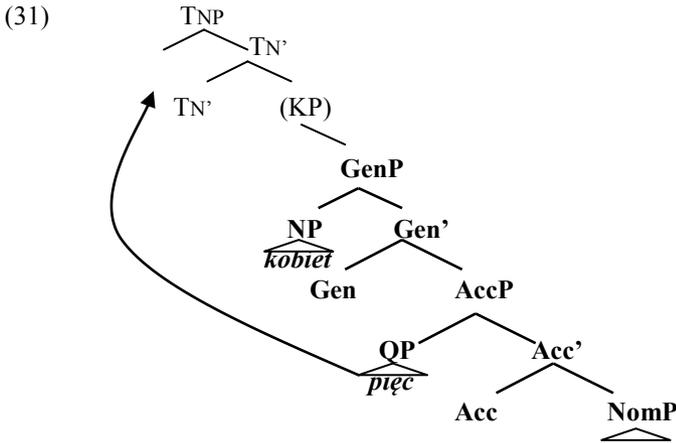
13 We take the property of the Nom/Acc Agree relation with Q in (29) to be a deficiency in the case morphosyntax of the numeral/quantifier system, an idiosyncrasy without any consequences for other aspects of the derivation; for instance ellipsis and sub-extraction do not distinguish between these QPs (the heterogeneous class) from the others (the homogeneous class). As for the theoretical potential of the feature sharing/non-sharing property in our system, suffice it to say that it elegantly captures the distinction between the Serbo-Croatian GoQ and the Polish (Russian) one; while in the latter case (29) shows that case of  $Q_h$  is not shared only with Acc/Nom, in the former  $Q_h$  blocks transmission of any case.

(b) Step 2: Escape of the noun (NP) to [spec,GenP] to receive Genitive



The second step of movement apparently constitutes a violation of the Freezing Principle of Müller (1998) and Chomsky (2001; 2008), which holds that moved constituents become islands, opaque to further movement from within. Although there are data confirming this view, there are quite a few cases showing that the Freezing Principle is not inviolable, for instance Collins's (2005a,b) analysis of passives and subject raising via smuggling, or an analysis of subject control in Witkoś (2013), and Visser's generalization in Witkoś and Żychliński (forthcoming). After each element of the nominal projection is settled with the appropriate case, the numeral moves up to regain the correct word order. We assume that this movement is driven by a formal feature (an overt equivalent to Marusić's [2009]  $EPP_{LF}$ ) whose interface relevance concerns recreating the high scope position of the numeral/quantifier within the TNP, e.g., (31):<sup>14</sup>

14 The movement of the QP does not include the NP (cf. Cinque 2005). Svenonius (2004, 282) argues that such unorthodox movement operations can be posited, provided there is overt evidence for them. In Polish the QP can be separated from the NP it modifies:



In light of the presented derivations and their analyses, we find no justification to claim that the numeral occupies different positions in high and low numeral phrases, and we take the Genitive of Quantification to be a consequence of the [- share T/T<sub>o(v)</sub> case] property of higher numerals and some other quantifiers.<sup>15</sup>

## 5. Conclusions

The intricate syntax of Polish nominals provides an interesting piece of evidence challenging the view that the nominal phrase can be treated on an equal footing with other maximal projections of phasal heads, i.e., CP and vP. The richness of (case) morphology in Polish Q<sub>H</sub>Ps within the nominal domain points to the fact that the most deeply buried elements of the nominal phrase are affected by the external probe, which clearly shows that the PIC cannot be activated at this point of the derivation. The delayed spell-out of the nominal complement seems to be a crucial component in the process of internal feature checking/valuation within nominals, based on the mechanism of feature sharing, as it avoids the complications of a standard Agree-based theory. Moreover, the successful formation of case-feature chains containing one feature instance valued and another (weakly) interpreted is secured by projections of the Kase Phrase. The KP encodes the connection between morphology and

- 
- (i) Jan                    pięć                    przeczytał                    [pięć                    książek]  
 Jan-3SG.MASC five-ACC.FEM read-3SG.MASC.PAST five-ACC.FEM books-GEN.NONVIR  
 “Jan read five books.”

15 Cf. Babby (1987); Rappaport (2002; 2003); Pesetsky (2012); Saloni and Świdziński (1998); Tajsner (1990); Dziwirek (1990); Bošković (2006); Przepiórkowski (1999); Bailyn (2004); Rutkowski (2002), among others, for different proposals regarding the structure of nominals with higher and lower numerals.

syntax, i.e., the valued instance of the case feature sits in the KP area, activated by an external probe (T/v-V).

Regarding the Genitive of Quantification, it has been proposed that it is a technical glitch in the case system, i.e., the interaction of the Nom/Acc Probe with the higher numeral blocks sharing the case feature with other elements of the nominal phrase. Consequently, the noun (and its adjacent modifiers) end up marked as Genitive, which is the most minimal target for a Last Resort movement of the [+case] residue in the structure presented in (29).<sup>16</sup>

## Funding Acknowledgement

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<sup>16</sup> We cannot fully explore the consequences of our assumption in (29) in this contribution, but we will seek to subsume other structural uses of the Genitive, such as the Partitive Genitive and the Genitive of Negation, under (29) in further work.

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# **In Search of Structure in Spoken and Written Language**



# Noun Phrase Simplicity in Spoken English

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**Abstract:** In this paper we show how a parsed corpus of English (the *British Component of the International Corpus of English*; ICE-GB) allows researchers to investigate aspects of the syntactic make-up of noun phrases in spoken and written English with a high degree of precision. We revisit Miller and Weinert's (1998) study of simple NPs, which was conducted on small samples, by comparing their results against those obtained from ICE-GB. As we have many more categories of text to examine, we are able to demonstrate that the frequency of simple NPs distributes text categories of speech and writing along an overlapping continuum. We conclude that the grammar of speech and writing is distinguishable both quantitatively and qualitatively, but, at least with regard to NP structure, positing two different grammars is not warranted.

**Keywords:** grammar; spoken English; complexity; simplicity; noun phrase structure; British Component of the International Corpus of English (ICE-GB).

## 1. Introduction

To anyone who has observed language it will be quite obvious that there are notable differences between spoken and written English. The former is produced “online” and hence characterized by disfluencies (hesitations, false starts, anacolutha, etc.), by contractions, and by the use of phrase and clause fragments. What's more, we often encounter speaker interruptions, reformulations, and the use of deictic lexical items.

With regard to the grammar of these genres, broadly speaking, two claims have been made. The first is the strong claim that the grammar of spoken and written English differs radically, and that we should therefore recognize different grammars for these genres in any language (Brazil 1995; Miller and Weinert 1998; McCarthy and Carter 2001; Miller 2006). A weaker claim is that the grammar of spoken and written English are essentially the same, but there may be frequency differences with regard to the kinds of constructions that are typical of the two genres (Leech 2000).

In this paper we will argue that the second view is correct by showing that claims made in the literature about the differences in the use of certain structures in spoken and written language can be overstated. This can be done efficiently by using a parsed corpus such as the *British Component of the International Corpus of English* (ICE-GB) as our database. In this paper we will look at noun phrase complexity in British English, testing a claim made by Miller and Weinert (1998) that noun phrases in spoken language are less complex than noun phrases in written English.

## 2. Previous Work on Spoken and Written Grammar

Several authors have suggested that we need different grammars to describe written and spoken language. With regard to second language learning McCarthy and Carter (2001, 51) express the belief that:

Whatever else may be the result of imaginative methodologies for eliciting spoken language in the second-language classroom, there can be little hope for a natural spoken output on the part of language learners if the input is stubbornly rooted in models that owe their origin and shape to the written language.

More generally, Miller and Weinert (1998, 2–3) suggest that:

there is a range of syntactic constructions typical of spontaneous spoken English and with parallel constructions in the spontaneous speech produced by speakers of other languages. . . . The constructions typical of spontaneous speech do not occur in written texts except in the representation of conversation. The constructions typical of written English are very rare in spontaneous speech and indeed are usually found only in the spontaneous speech of people who have passed both through secondary and higher education.

In their book, Miller and Weinert look at the complexity of noun phrases in spoken English. Rather than focus on the most complex structures, however, they examine the proportion of the simplest ones. They write:

One striking feature of spontaneous spoken language is the simplicity of noun phrases (NPs) in comparison with the NPs that occur in written language, particularly in the language of formal written texts. . . . What do we mean by “simplicity”? For written English (and written Russian and written German) a relatively simple noun phrase consists of a noun modified by one or two adjectives, or a numeral/quantifier, or a prepositional phrase, or some combination of these modifiers. The simplest noun phrases consist of just a noun or pronoun. (Miller and Weinert 1998, 135)

The authors examined the complexity of NPs in a number of languages, including English. Comparing the genres of monologue and dialogue with the genre of letters, they present the data in Table 1 for English NPs that contain only a noun or only a personal pronoun as head:

| NP heads               | Monologue   | Conversation  | Letters    |
|------------------------|-------------|---------------|------------|
| Personal pronoun       | 311 (42.6%) | 1,308 (49.2%) | 63 (14.1%) |
| Noun                   | 49 (6.7%)   | 127 (4.8%)    | 68 (15.2%) |
| [Other NP structures]  | [370]       | [1,222]       | [316]      |
| <b>Total (all NPs)</b> | 730         | 2,657         | 447        |

**Table 1:** Noun phrases with either a single noun or a personal pronoun as head. Data from Miller and Weinert (1998, 146, 153, 154).

These data suggest that noun phrases tend to be less complex in spoken than in written language: in monologue the percentage of NPs that contain either a single noun or a personal pronoun as head totals 49.3%, whereas in dialogue the total is 54.0%. By contrast, in the genre of written letters the total is 29.3%.<sup>1</sup>

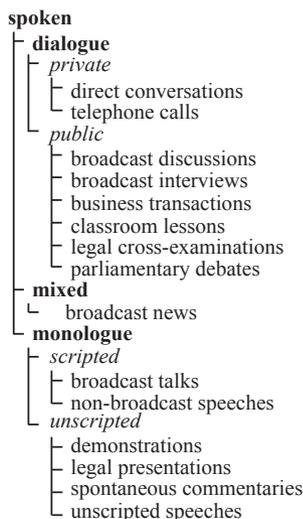
However, we should treat Miller and Weinert's results with some caution. First of all, the authors do not state how long their extracts were. Given the high incidence of noun phrases in general (as we will see, in the one million-word ICE-GB corpus there are over 314,000 instances), the extracts, especially the monologues and letters, cannot have been very long. Secondly, the authors used only two broad genres of spoken English without investigating the differences within those genres. Thirdly, the speakers in the spoken material were all aged between 18 and 23; the range of topics discussed was of necessity very limited, and the number of independent participants (and thus independently-uttered NPs) is likely to have been small. In the next section we will look at how some of these limitations may be overcome with the aim of arriving at more reliable results.

### 3. Investigating NP Complexity Using a Parsed Corpus

In this paper we suggest that the best way to investigate NP complexity is to use a balanced tagged and parsed (i.e., fully grammatically analyzed) corpus. Balanced corpora contain a wide range of genres to reflect different language uses. In recent years The *British Component of the International Corpus of English* (ICE-GB) has established

<sup>1</sup> The figures for conversation and monologue are significantly different at the 0.05 error level according to a Newcombe-Wilson test with continuity correction (Wallis 2013). The written figures are also significantly different: they are clearly distinct.

itself as a key resource for investigating grammar and usage in spoken and written English (see, e.g., Nelson et al. 2002).<sup>2</sup> ICE-GB contains spoken material in the categories shown in Figure 1.



**Figure 1:** Spoken text categories in ICE-GB.

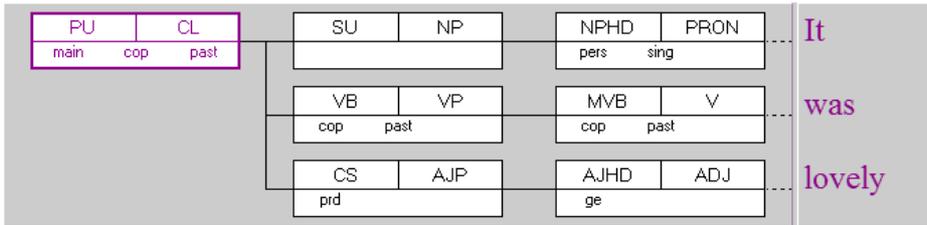
The orthographically-transcribed spoken data has been split into putative “sentences” (called “Parsing Units,” PUs), and, along with written texts, has been fully parsed according to a detailed phrase structure grammar based on Quirk et al. (1985).

In this paper, we are interested in the structure of noun phrases. ICE-GB gives us a massive database of 314,886 NPs that have already been identified and analyzed in the corpus during the parsing process. Using the dedicated ICECUP software,<sup>3</sup> researchers can conduct reliable searches over large amounts of data in different genres and ranging over many topics. The speakers are drawn from a wide range of age groups. Given the size of the corpus, the results are more likely to be broadly representative of comparable data, and they can therefore be stated with a greater degree of reliability.

How does corpus exploration work? Each sentence in the corpus (PU) is assigned a grammatical analysis in the form of a tree diagram, like the one shown in Figure 2.

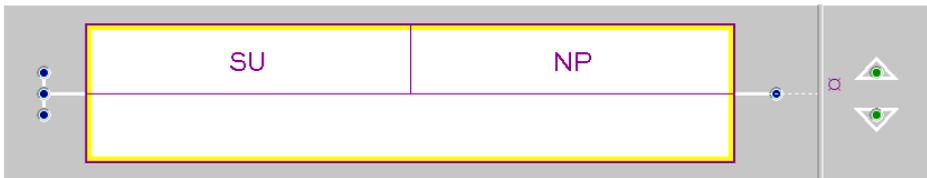
<sup>2</sup> For recent papers on language change in spoken English using ICE-GB’s “sister” corpus, the *Diachronic Corpus of Present Day Spoken English*, see, e.g., Aarts et al. (2013), Bowie et al. (2013), and Aarts et al. (2014).

<sup>3</sup> The International Corpus of English Corpus Utility Program (Nelson, Wallis, and Aarts 2002).

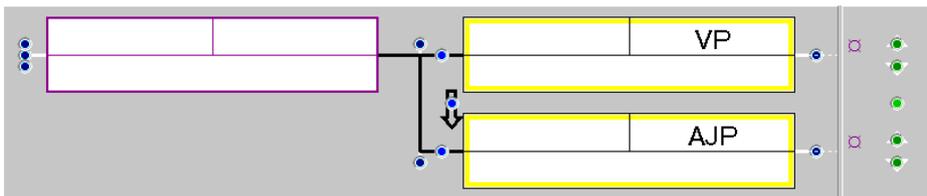


**Figure 2:** An example of a phrase structure tree for the sentence *It was lovely*.<sup>4</sup>

In this tree each “node” has three zones which contain information about function (top left), form (top right), and features (bottom). To make them easy to read, we draw the trees from left to right, although other visual representations, including a conventional top-down tree view, are also possible. Users can search the corpus by constructing what we call *Fuzzy Tree Fragments* (or “FTFs” for short). FTFs are fragments of trees constructed by users to search the corpus for lexical or syntactic patterns. They can consist of single-node searches like Figure 3 (a search for all noun phrases in the corpus that function as subject, e.g., *it* in Figure 2), or more complex patterns like the one in Figure 4, which matches all cases of a verb phrase followed by an adjective phrase (such as the example shown in Figure 5).

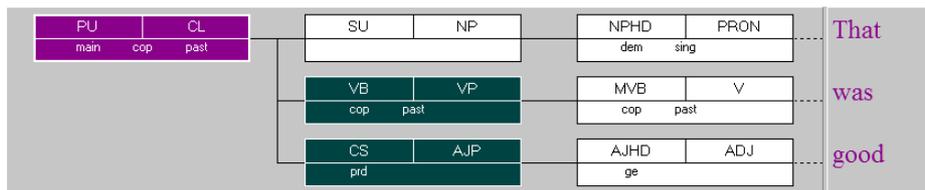


**Figure 3:** An FTF created to search for NPs functioning as subjects.



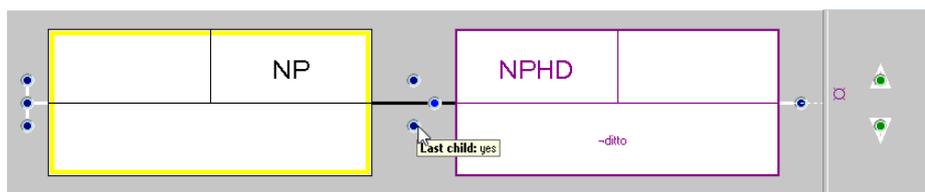
**Figure 4:** An FTF created to match VPs followed by adjective phrases.

<sup>4</sup> Gloss: PU = parsing unit, CL = clause, main = main clause, cop = copular, past = past tense, SU = subject, NP = noun phrase, NPHD = NP head, PRON = pronoun, pers = personal, sing = singular, VB = verbal, VP = verb phrase, MVB = main verb, V = verb, CS = subject complement, AJP = adjective phrase, prd = predicative, AJHD = adjective phrase head, ADJ = adjective, ge = general.

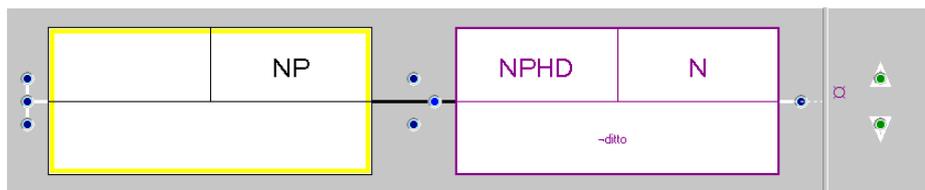


**Figure 5:** A tree found by searching for the FTF in Figure 4. In addition to the gloss for Figure 2, dem = demonstrative.

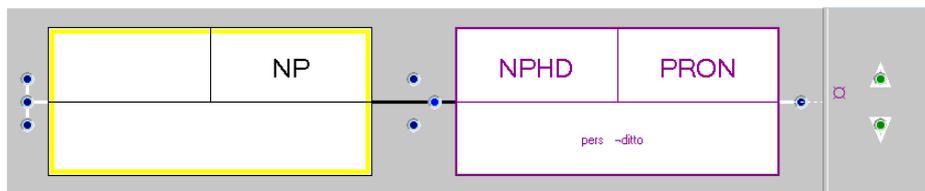
We can easily search for all noun phrases in ICE-GB that consist of only a head (of whatever category), a noun head, or a personal pronoun head, using the FTFs shown in Figures 6–8.<sup>5</sup>



**Figure 6:** An FTF that searches for NPs with a single head (of whatever category).

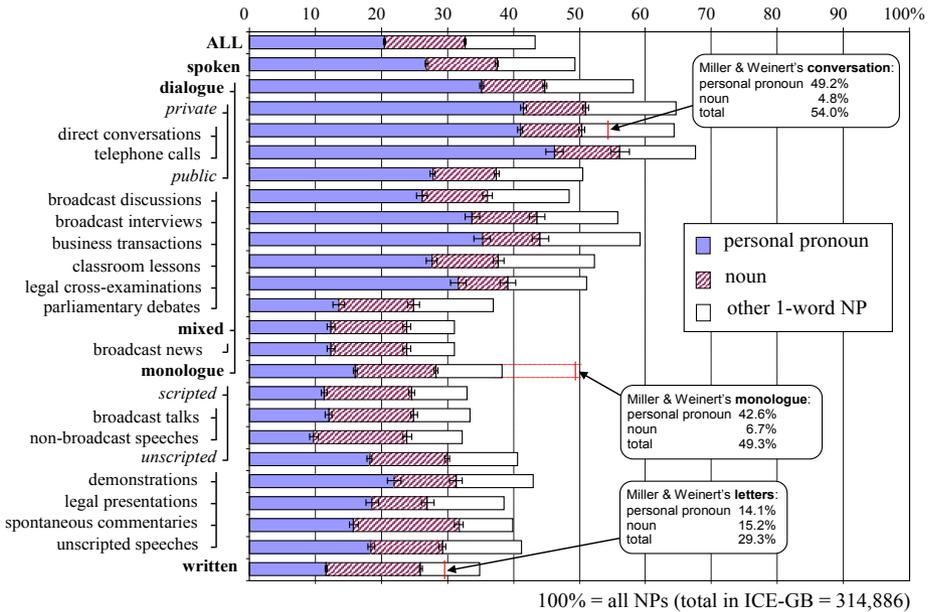


**Figure 7:** An FTF for NPs with a single head realized by a noun.



**Figure 8:** An FTF for NPs with a single head realized by a personal pronoun.

<sup>5</sup> The absence of links before or after the node (indicated by the cursor arrow in Figure 6) restricts the search to NPs consisting of a single head. “Last child: yes” requires that the node is not followed by any other nodes. The label “-ditto” (“not ditto-tagged”) excludes compounds and compound-like structures.



**Figure 9:** Proportion of NPs consisting of a single noun or personal pronoun head in various subcorpora of ICE-GB, with Miller and Weinert's data for comparison.

We apply these searches over each text genre in ICE-GB, totaling 314,886 noun phrases. We obtain results in the form of a bar chart, the spoken component of which is plotted in Figure 9 above. Note the hierarchical structure of the chart, so “All” covers speech and writing; “spoken” covers dialogue, monologue and mixed, etc. Miller and Weinert's overall percentage results for conversation, monologue and newspaper letters are added for comparison purposes. The percentages for single noun and personal pronoun heads in written English are also shown in this graph for comparison.

In this graph, as in Miller and Weinert's results (see Table 1), percentages are expressed as a proportion of the total number of noun phrases. In each genre, the percentage of single nouns as head and personal pronouns as head is shown in horizontal bars, along with the percentage of other kinds of one-word NPs (e.g., NPs headed by an indefinite pronoun, numeral, etc.) Confidence intervals are indicated by the I-shaped “error bars” represented horizontally within the bars.<sup>6</sup>

<sup>6</sup> A confidence interval is a method of representing the degree of confidence a researcher can have in a value that has been observed, and can be indicated by so-called “error bars” or as a numerical range (e.g.  $\pm 5\%$ ). We estimate that the actual value in the population is anywhere within the confidence interval at a given level of probability (say  $\alpha < 0.05$ ). In this paper, confidence intervals are computed using the Wilson score interval method (Wallis 2013).

## 4. Discussion

What do the data we found in ICE-GB tell us? If we look at monologues first, we see that, based on a single short monologue, Miller and Weinert found that 49.3% of NPs in their data contained either only a noun (6.7%) or only a personal pronoun (42.6%) as head. However, by contrast, looking at the larger and more diverse dataset drawn from ICE-GB, we find that a mere 28.3% contain only a noun or personal pronoun as head, and, in this data, the distribution between the two kinds of head is roughly equal (16% vs. 12.3%). A further 10% constitutes other single-word NPs.

We also see that the different monologue subgenres behave differently in terms of NP-headedness. Thus, comparing bars vertically, “demonstrations” and “spontaneous commentaries” show a higher percentage of NPs with a single noun or personal pronoun as head than “legal presentations” and “unscripted speeches.” Taken together, the monologue data clearly support the fact that if a text is “scripted” this entails that there will be fewer simple NPs. In this respect, compare especially the difference between non-broadcast speeches and unscripted speeches.<sup>7</sup> It is clearly risky to base conclusions about NP complexity on a single genre of monologue.

With regard to direct conversation, in ICE-GB, 41.0% are personal pronouns and a mere 9.4% are nouns (cf. 49.2% and 4.8% respectively in Miller and Weinert’s data). With regard to all dialogues combined, we find that around 44.8% of NPs consist of a single head, and of these around 35.2% are personal pronouns, and 9.6% nouns.

The differences between dialogue genres are quite pronounced. First, there is a clear divide between “private” and “public” conversations, with the former showing 50.9% of single noun or personal pronoun heads, and the latter 37.5%. Note that across all the dialogue genres the percentage of single noun heads remains more or less constant: at between 8 and 12%. This is higher than that found by Miller and Weinert (4.8%). The differences between the dialogue subgenres are due to the different frequency of personal pronoun heads in the subgenres of private dialogue (“direct conversations” and “telephone calls”): these show the highest percentage use of noun phrases consisting of a single personal pronoun (around 41.0% and 46.2%, respectively).

Turning now to written language, in our dataset, 26.0% of all noun phrases consists of either only a noun or a personal pronoun. This is slightly lower than Miller and Weinert’s figure of 29.3% in written language (which consisted only of letters to a newspaper). Miller and Weinert’s newspaper letters approximate the percentages found in our written corpus rather more closely than their spoken data do.

Although the data is not shown in Figure 9, the most similar subcategory to written letters in our corpus, “business letters,” show proportions of 18.7% (personal

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<sup>7</sup> Our thanks to an anonymous reviewer for pointing this out.

pronouns) and 9.8% (nouns), respectively. The proportions are different, but the total is approximately the same.

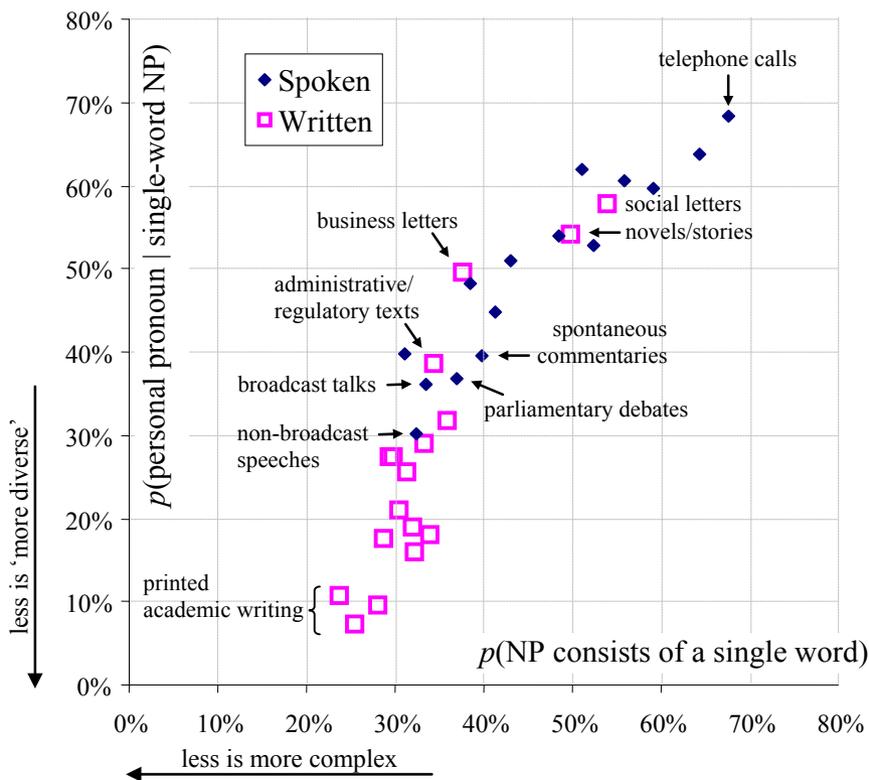
Taken together, what these figures show us is that even when performing a relatively simple comparison—in our case, investigating the differences in noun phrase complexity between spoken and written language—we obtain more reliable results using a larger corpus drawn from multiple text sources and types, and this is accomplished more efficiently using a parsed corpus. Although it is true that spoken language is characterized by less complex noun phrases, as Miller and Weinert have claimed, this difference seems to be much less pronounced than their data bear out. This conclusion is based on the fact that in the spoken part of the balanced ICE-GB corpus we find far fewer noun phrases consisting of a single noun as head, or only a personal pronoun as head. It is also easier to see the degree to which results differ between genres.<sup>8</sup>

For the characteristics under study, the distinction between spoken and written material comprises an overlapping continuum. Figure 10 below plots a scattergraph over two dimensions: the probability that an NP consists of a single word (horizontally), and the probability that, if the NP is a single-word NP, it is a personal pronoun (vertically).

In plain English, genres appearing to the left of the graph contain a lower proportion of NPs with a single word head (i.e., the NPs tend to be more complex). Similarly, the text categories appearing towards the bottom of the graph tend to have fewer NPs consisting of personal pronouns as a proportion of the total of nouns, numerals and other single-word NPs (the most likely explanation being that personal pronouns alternate with nouns). Despite the fact that these two probabilities are independent, they appear to closely correlate. Moreover, we can see that spoken and written categories, whilst distributing along a continuum, also overlap.

In ICE-GB, the written categories “novels and stories,” and “social letters” have higher frequencies of single-word NPs, and are more similar to the spoken data, whereas the spoken “broadcast news” category has lower equivalent frequencies, and is more consistent with the written data. By comparing multiple subcategories of both speech and writing, we obtain results that are consistent with the weaker claim mentioned in the introduction regarding the differences in grammar between speech and writing.

<sup>8</sup> Some colleagues take this argument further to the conclusion that what is needed are multi-million word corpora such as the *Corpus of Contemporary American English* (COCA) or the *British National Corpus* (BNC). These corpora are 100–400 times larger than ICE-GB. However, they contain a far higher proportion of written material, and compilers are often compelled to trade quantity for sampling language data that is more difficult to obtain. Thus around 10% of the BNC consists of transcribed speech data. Another problem with these corpora is that they are not parsed, which is a far more significant problem for complex queries. Nonetheless, such corpora represent the next tier of sample size, and should not be overlooked.



**Figure 10:** Scattergraph of text genres in ICE-GB; distributed (horizontally) by the proportion of all noun phrases consisting of a single word and (vertically) by the proportion of those NPs that are personal pronouns; spoken and written, with selected outliers identified.

The conclusions we can draw from this pilot study regarding NP structure are necessarily limited, but our data do support the view that the grammars of speech and writing are not radically different in this respect, as has sometimes been suggested. It is entirely feasible to conduct further investigations into the oft-perceived differences between the grammar of spoken and written English using parsed corpora. It is possible to explore parsed corpora further to investigate more complex patterns, such as different degrees of pre- and postmodification (cf. Wallis forthcoming), patterns of transitivity in verb phrases, etc. The fact that the painstaking annotation work has already been performed in ICE-GB, combined with the ease of retrieval using FTFs, makes this corpus ideal for this purpose.

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# ReALIS: Discourse Representation with a Radically New Ontology

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**Abstract:** In the framework of ReALIS, which has reorganized DRT via a radically new ontology, pragmatic, and cognitive aspects of communication which stretch beyond the traditional scope of formal semantics can be described. We can define the pragmatic-semantic character of the five basic sentence types, as well as the role of discourse particles in modifying these basic profiles—“fine-tuning” them. We can also capture the peculiar roles interlocutors play in conversations with special castings and different ways of deception. Thus ReALIS is opening up new areas of formal description in exploiting the capabilities of the DRT-style information box hierarchy as this hierarchy not only serves the purpose of the “dynamic” reformulation of logical formulas but can also be assigned to all kinds of word- or sentence-level, linguistic, or extralinguistic factors that make any contribution to the ultimate meaning and use conditions of sentences and texts.

**Keywords:** discourse representation; cognitive viewpoint; sentence types; discourse particles; deception.

## 1. A Sketchy Introduction to the World(s) of ReALIS

In the post-Montagovian world of formal semantics, DRT (Kamp et al. 2011)—which offers a revolutionary solution to the resolution problem of (“donkey”) anaphora and attractive visual representations for discourse meaning—is often criticized from “inside” as well as from “outside,” considerably weakening its legitimacy. The internal criticism comes from the world of dynamic model-theoretic semantics, from the Amsterdam School (Groenendijk et al. 1996), and pertains to the (mathematically unquestionable) eliminability of exactly this attractive visual representation,

insisting on “Montague’s heritage.” The external criticism comes from the Proof-Theoretic School (Francez and Dyckhoff 2010); they point at the dubious status and construction of possible worlds.

We claim that ReALIS, “**R**eciprocal **A**nd **L**ifelong **I**nterpretation **S**ystem” (see <http://lingua.btk.pte.hu/realispapers>; Alberti and Kleiber 2012; Alberti and Károly 2012)—while relying heavily on the representationalism of DRT in the course of solving a wide range of linguistic problems in order to maximally exploit and develop the excellent facilities provided by this representationalism—offers exactly the radical ontological innovation which lies with the elimination of the above-mentioned two dubious levels of representation, referred to as (1a) and (1c) below:

- (1) Components/levels of representation in DRT:
  - (a) DRS: the semantic representation of sentences constituting coherent texts
  - (b) Model of the external world (for extensional interpretation)
  - (c) Possible worlds (for intensional interpretation)
  - (d) Interlocutors’ information states

ReALIS embeds representational levels (1a) and (1c)—more exactly, their relevant content—in the representation of information states (1d), relying on the stance that, as interlocutors obtain information through discourses, their information states are worth regarding as gigantic lifelong DRSs. An information state has a double nature: it functions as a “representation” in the above regard, while it is used as “what is to be represented” in the interpretation of the intensional sentence types (2e)–(2g) below: it also depends on Mary’s information state if these sentences are true, in contrast to sentences (2a)–(2d), the truth values of which only depend on facts in the external world. Before entering into details, we must note about the aforementioned “double nature of information states” that modern set theory is totally reliant on a similar idea: sets and their elements must not be mixed up; this does not mean, however, that a set could not serve as an element of another set.

- (2) (a) Joe is hungry.
  - (b) Joe is indignant.
  - (d) Joe is hungry and indignant.
  - (d) If Joe is hungry, he is mostly indignant.

- (3) (a) Mary knows that Joe is hungry.  
 (b) Mary knows that Joe is indignant.  
 (c) Mary knows that Joe is hungry and indignant.  
 (d) Mary knows that if Joe is hungry, he is mostly indignant.

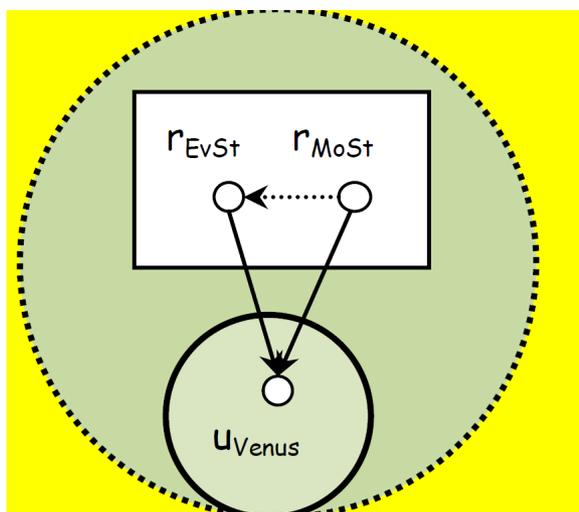
$\mathfrak{ReALIS}$  carries out the task of interpreting (2a)–(2d) in a model-theoretic way, relying upon the logically closed status of the infinite model of the external world (1b) while it carries out the “internal” part of the task of interpreting (3a)–(3e) essentially according to the method of Proof Theory (e.g., Francez and Dyckhoff 2011): a step-by-step procedure of accommodation should be performed over the finite universes of certain information states.

Finally, we will illustrate the descriptive and explanatory power of  $\mathfrak{ReALIS}$  by sketching the interpretation of sentence (4a), featuring *realize*, which is also a factive verb, similarly to *know* (3). Hence, it is a precondition of interpreting the sentence as true (or rather, as “well-formed”) that the Evening Star should coincide with the Morning Star in (the model of) the external world. This means that the entity referred to as the Evening Star by the given astronomer should be the same entity he refers to as the Morning Star. In the approach of  $\mathfrak{ReALIS}$ , this relation is captured formally as demonstrated in (4b) below: the internal entity  $r_{\text{EveningStar}}$  should be anchored to the same external entity as the internal entity  $r_{\text{MorningStar}}$ . The astronomer himself is not (necessarily) aware of the co-anchoring of the two internal entities at his disposal (in his appropriate worldlet); but the fact of co-anchoring is an external requirement as a result of the factive character of the verb. Two further requirements to be satisfied in order for sentence (4a) to qualify as true concern two information states of the astronomer at different points in time, independently of the external world: what is to be checked is whether there is a “same-as” relation between the internal entity  $r_{\text{EveningStar}}$  and the internal entity  $r_{\text{MorningStar}}$  in the one information state (4d), while they do not stand in the “same-as” relation in the other one (4c).

- (4) The interpretation of *realize* and the philosophers’ *Venus* problem
- (a) An ancient astronomer realized that the Evening Star is the same as the Morning Star.
- (b)  $\alpha(r_{\text{EveningStar}})$  is-the-same-as  $\alpha(r_{\text{MorningStar}})$  (since  $u_{\text{Venus}}$  is-the-same-as  $u_{\text{Venus}}$ ).
- (c) It does not hold that  $r_{\text{EveningStar}}$  is-the-same-as  $r_{\text{MorningStar}}$  at  $\tau$  in the astronomer’s worldlet of astronomic hypotheses.

- (d) It holds that  $r_{\text{EveningStar}}$  is-the-same-as  $r_{\text{MorningStar}}$  at  $\tau'$ , which is a later point of time in the astronomer's worldlet of astronomic hypotheses.

All in all, three competing world(let) models should be considered simultaneously (the “prism effect”), and three entities—an external one and two internal ones (Figure 1)—should be inspected. As the three models are all parts of the one complete model of the history of the external world and all the internal reflections associated with it, in this matrix model (4b)–(4d) all can be checked. Note that the analysis relies on the same facilities as those available in the cognitive linguistics framework used by Pelyvás (2006, 204–5), who follows Langacker's (2004) approach to nominal grounding. The most important tenet of this view is that all nominals are grounded in the “reality” of the Idealized Conceptual Model(s) (ICM) evoked in the discourse, which is relative to the speaker and hearer, rather than directly in objective reality. From the point of view of linguistic analysis the reality that we could call “objective” (i.e., independent of speakers' and hearers' beliefs) is only of marginal importance. This is true of proper names as well. Pelyvás adds that grounding a proper name in one ICM does not necessitate the referent's successful identification.



**Figure 1.** The external entity Venus and two internal entities anchored to it.

The mathematical definition system of REALIS fills 40 pages (available here: <http://lingua.btk.pte.hu/realispapers>). For the purposes of this paper, however, it is practically the single definition in (5) below that is required, which can then be associated with spectacular visual representations, similar to the hierarchically arranged information boxes used in DRT.

- (5) The “prism effect” in the decision of truth conditions and well-formedness conditions of sentences:

A sentence uttered in a context conveys a piece of information (PoI) that belongs to an *intensional profile* which is an element of the set defined below. The sentence is to be interpreted against the (possible-world-like but finite) components of this intensional profile in order to obtain its truth conditions and well-formedness conditions in the given context.

$$\mathcal{P}(\mathbb{M} \times \mathbb{I} \times \mathbb{R} \times \mathbb{T} \times \mathcal{P}\{+, -\})^*$$

Below we would like to convince the reader that the theoretically highly important mathematical exactness which this formula is intended to suggest provides a simple, straightforward, uniform, well-motivated, and “user-friendly” approach to reaching the ultimate aim of pragmalinguistics (Leech 1983; Gyuris 2013): to account for the use of the semantic content of the sentences uttered in a certain context.

Let us start the elaboration of the details with set M in formula (5): it is the set of modal labels saying whether a PoI serves someone as some kind of belief (BEL), desire (DES), intension (INT), or something else. Set I provides (4–5) degrees for expressing the intensity of the given modality, from “maximum” (MAX) through “great” (gr) to “some” (sm). Associated with the modality BEL, for instance, this scale ranges from sure knowledge to weak conjecture. Set R is responsible for referring to the host of the given PoI, who can primarily be the speaker (MY) or the listener (YR). That is, the possible-world-like (but finite) basis of interpretation (5), called a “worldlet” in  $\Re\text{ALIS}$ , can be the conglomerate of “my faint conjectures” or “your strong desires,” and so on.

Set T adds “temporal stamps” to worldlets, expressing in which period it holds that a given PoI belongs to a given worldlet (to the one, for instance, that stores someone’s faint conjectures).

Worldlets are also assigned polarity values, which are members of the four-element powerset  $\mathcal{P}\{+, -\}$  of the two traditional polarity values “true” (+) and “false” (–). The unusual values are “non-specified” (0) and “specified (but with a truth value not given)” ( $\theta$ ). The crucial importance of the fact that the traditional two-element set of truth values has been extended to a four-element one will be clear when the intensional profile of interrogative sentences has been discussed in the following section.

The Kleene star in formula (5) manifests the “reciprocal” character of  $\Re\text{ALIS}$  by offering, instead of quintuples of the above-discussed labels, finite series of such quintuples. The series shown in (6a) below, for instance, applied to the PoI, say, “Peter called Mary,” expresses the situation formulated in (6b) in some way and in (6c) in a “more cognitive” way.

- (6) (a)  $\langle\langle\text{BEL,gr,MY},\tau,+ \rangle, \langle\text{BEL,MAX,YR},\tau,\theta \rangle\rangle$
- (b) “The speaker considers it highly likely that the hearer surely knows whether Peter called Mary, or not.”
- (c) “It is my quite reliable hypothesis that there is a completely reliable PoI at your disposal concerning the (potential) event of Peter calling Mary.”
- (d)  $\{\langle\text{BEL,MAX,MY},\tau,0 \rangle, \langle\langle\text{BEL,gr,MY},\tau,+ \rangle, \langle\text{BEL,MAX,YR},\tau,\theta \rangle\rangle\}$
- (e) “I do not know whether Peter called Mary, or not, but I think that you know the truth.”

Finally, the powerset symbol in the initial position of formula (5) above requires some explanation. The point is that a PoI is simultaneously associated with more series of worldlet labels. The reference to the “prism effect” in (5) above expresses this viewpoint. The set of complex worldlet labels exhibited in (6d) above, for instance, characterizes the situation and the interlocutors’ information states in the way formulated in (6e) in English.

A discussion will be given of what grammatical clues are at our disposal to produce (compositionally) intensional profiles as defined in (5) above. (For a more detailed description of the compositional process behind the building of the profiles, the interested reader is referred to Alberti and Kleiber [2010].)

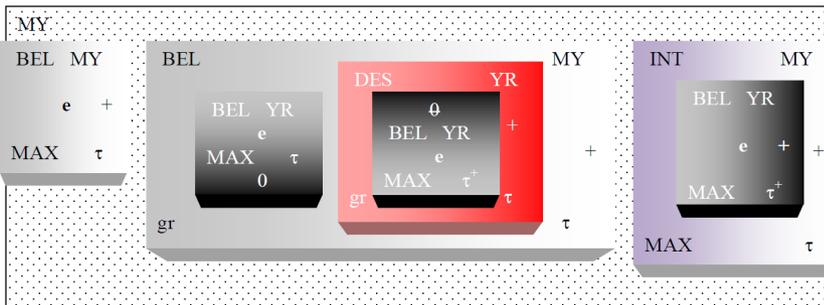
First of all, picking out the sentence type can be regarded as the “basic settlement” (Section 2) of the intensional profile, relative to which discourse particles (and other grammatical elements) are responsible for “fine-tuning” (Section 3). The intensional profile calculated in this way, however, should be re-evaluated (Section 4) if the interlocutors stand in some special relation in the conversation (and/or in the society). It can also be taken into account that the speaker may have had recourse to numerous forms of deception, having exited the ideal speaker’s role (Grice 1975). The different forms of deception can be defined as the difference between the intensional profile calculated on the basis of the factors listed above and the relevant segment of the speaker’s real information state, that is, the difference between what is shown and what is really thought (Section 5).

A preliminary remark should also be made before illustrating the system of grammatical clues playing some role in the building of intensional profiles in Hungarian: it would go far beyond the scope of this paper to enter into the numerous methodological questions about calculating intensional profiles in practice. We would like to highlight only one decisive principle, namely, that of simplicity, as formulated in Chomsky’s (2014) Olomouc talk. The point is that we should be sure that the intricate

conglomerate of “visible” observations can be accounted for by means of a small set of presently “invisible,” simple rules, among which there is an infinite possibility for interaction, and to which the intricacy of the “visible” can be attributed. We claim that it is the formula in (5) above that the whole intricacy of intensional phenomena, on the one hand, and of grammatical clues, on the other, can be based upon.

## 2. The Five Sentence Types as “Basic Settlements” of the Intensional Profile

We are going to propose a four-component intensional profile in Figure 2 according to the formula in (5) in order to capture the conditions of the legitimate use of the declarative sentence type (in Hungarian). The pragmatico-semantic content of the multi-storey information-box conglomerates is also provided under the visual representation.



**Figure 2.** The intensional profile of the Hungarian declarative sentence.

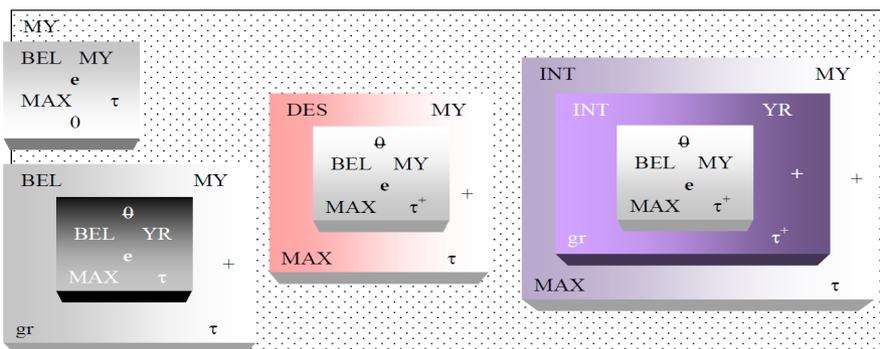
The content of the components in Figure 2, from left to right, applied to the Hungarian sentence *Péter felhívta Mari-t* ‘Péter called Mari.Acc’ “Péter called Mari” (e) is as follows: “1. I know that Péter called Mari (I refrain from telling lies or bluffing). 2. I think that you do not know this. 3. I think that you would like to be aware of this fact at a later point  $\tau^+$  in time (otherwise, I would not have uttered the sentence, since it is important for me to be relevant). 4. (Being also cooperative) I intend to help you to acquire the PoI in question.”

If we separate pragmatics from semantics, a rough approximation would be that the content of eventuality e (information about referents  $r_{\text{Péter}}$ ,  $r_{\text{Mari}}$ , etc.) belongs to semantics, while everything else (statements about eventuality e—in fact every “box” in Figure 2) belongs to pragmatics—as being some kind of felicity conditions for uttering e.

It is obviously an open point to be decided on the basis of much future empirical and theoretical research whether we can or should find more precise well-formedness conditions for the Hungarian declarative sentence (and for all the kinds of sentences we will discuss in this paper). We are approaching the question from the direction of a hypothesized “simple” pragmatico-semantic system in the background (in the aforementioned Chomsky’s [2014] sense of simplicity), which requires the decision of

the answers to such questions as what (the degrees of) the speaker’s and/or the hearer’s belief (BEL), desire (DES), and intention (INT) are in respect of the possession or acquisition of a given PoI, and also with respect to each other in a multi-faceted way. The three-layered “building” of boxes in Figure 2, for instance, expresses that “[it is likely according to the speaker that [the hearer has quite a strong longing for [the maximum degree of knowledge concerning a certain PoI]]].”

Answers to similar questions have led us to an intensional profile of the Hungarian yes/no question, a visual representation of which is shown in Figure 3. It is to be regarded as a manifestation of our aforementioned system principle that this profile also consists of a one-storey and a three-storey building of boxes and two two-storey ones, that is, it shows related pragmatico-semantic content with the same complexity.



**Figure 3.** The intensional profile of the Hungarian yes/no question.

The content of the components in Figure 3, applied to the Hungarian sentence *Péter felhívta Mari?* ‘Péter called Mari.Acc’ “Has Péter called Mari?,” is as follows: “1. Now it is me who does not know if Péter called Mari. 2. I think, however, that you know the truth. 3. I wish I also knew the truth. 4. (That is why I have started the conversation) I intend to help you to intend to help me to acquire the PoI in question.”

As is demonstrated in Table 1 below, we attribute similar complexity to the intensional profile of the Hungarian imperative sentence, while the optative sentence and the exclamative sentence are considered to be simpler. This latter evaluation is due to the fact that in the latter two cases no hearer seems to be involved in the speaker’s thoughts. The optative sentence simply expresses that the speaker longs for something that does not hold, while the exclamative sentence expresses that the speaker has a new piece of knowledge, which (s)he was not aware of somewhat earlier ( $\tau$ ) and which (s)he finds either very desirable or very undesirable. In the case of the Hungarian exclamative sentence type, thus, the type itself does not reveal the polarity of the speaker’s strong affected status ( $\theta$ ).

| Declarative  | Imperative   | Interrogative  | Optative  | Exclamative  |
|--|--|--|---|--|
| $\langle \text{BEL}, \text{max}, \text{s}, \tau, + \rangle$  | $\langle \text{BEL}, \text{max}, \text{s}, \tau, - \rangle$  | $\langle \text{BEL}, \text{max}, \text{s}, \tau, 0 \rangle$  | $\langle \text{BEL}, \text{max}, \text{s}, \tau, - \rangle$ | $\langle \text{BEL}, \text{max}, \text{s}, \tau, + \rangle$<br>$\langle \text{BEL}, \text{max}, \text{s}, \tau, 0 \rangle$ |
| $\langle \text{BEL}, \text{great}, \text{s}, \tau, + \rangle$<br>$\langle \text{BEL}, \text{max}, \text{i}, \tau, 0 \rangle$   | $\langle \text{BEL}, \text{great}, \text{s}, \tau, + \rangle$<br>$\langle \text{BEL}, \text{max}, \text{i}, \tau, - \rangle$ | $\langle \text{BEL}, \text{great}, \text{s}, \tau, + \rangle$<br>$\langle \text{BEL}, \text{max}, \text{i}, \tau, \theta \rangle$  |   |  |
| $\langle \text{BEL}, \text{great}, \text{s}, \tau, + \rangle$<br>$\langle \text{DES}, \text{great}, \text{i}, \tau, + \rangle$<br>$\langle \text{BEL}, \text{max}, \text{i}, \tau^+, \theta \rangle$ | $\langle \text{DES}, \text{max}, \text{s}, \tau, + \rangle$  | $\langle \text{DES}, \text{max}, \text{s}, \tau, + \rangle$<br>$\langle \text{BEL}, \text{max}, \text{s}, \tau^+, \theta \rangle$  | $\langle \text{DES}, \text{max}, \text{s}, \tau, + \rangle$ | $\langle \text{DES}, \text{max}, \text{s}, \tau, \theta \rangle$   |
| $\langle \text{INT}, \text{great}, \text{s}, \tau, + \rangle$<br>$\langle \text{BEL}, \text{max}, \text{i}, \tau^+, + \rangle$   | $\langle \text{INT}, \text{max}, \text{s}, \tau, + \rangle$<br>$\langle \text{INT}, \text{max}, \text{i}, \tau, + \rangle$   | $\langle \text{INT}, \text{max}, \text{s}, \tau, + \rangle$<br>$\langle \text{INT}, \text{great}, \text{i}, \tau, + \rangle$<br>$\langle \text{BEL}, \text{max}, \text{s}, \tau^+, \theta \rangle$ |   |  |

**Table 1.** The intensional profiles of the five basic sentence types.

The imperative sentence is worth comparing to the optative sentence: the speaker is also declared to long for something that does not hold. It is also expressed, however, that (s)he attributes the same knowledge to the hearer, and intends to convince him or her (by uttering the given utterance) to help in realizing the desirable situation.

We conclude this section by emphasizing again that in the current phase of the research we have aimed at nothing more nor less than constructing a starting hypothesis on the “distribution of pragmatico-semantic labor” among the five basic sentence types (in Hungarian), which only serves as a starting point from an empirical viewpoint but shows a high level of explanatory adequacy as being a uniform, coherent, and compact system.

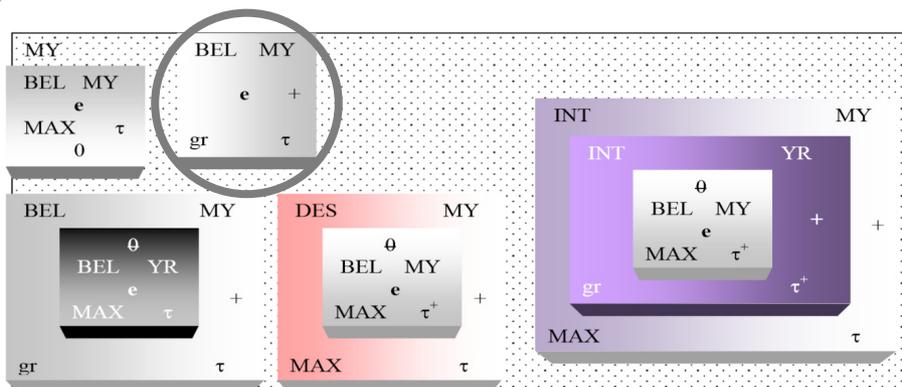
### 3. Discourse Particles as “Fine-Tuning” of the Intensional Profile

At a certain point of our research project (Alberti, Vadász, and Kleiber 2014), we were led to the conclusion that it is worth asking the straightforward research question—which grammatical clue is to be defined in what way according to the formula in (5)?—in the reverse direction: How does the language, by means of its numerous tools, fill in the multidimensional matrix of the complete range of possibilities provided by formula (5)? It is on the basis of this question that we could formulate the hypothesis that the characteristic role of discourse particles is nothing other than enabling speakers to reach the positions remained “unfilled” after the placement of the intensional profiles of the five basic sentence types in the aforementioned “matrix of possibilities.” It is this that we mean by saying that discourse particles “fine-tune” the intensional information coming from the “basic settlement” that the sentence type determines.

Note that we consider the following strong hypothesis to be defensible: the pragmatico-semantic contribution of discourse particles to the information coming from the choice concerning sentence type is compositional (Groenedijk et al. 1996)

and calculable. It would go beyond the scope of this paper to enter into formal details; the crucial detail we intend to highlight is that the compositional cumulation of the (partially conflicting) different kinds of pragmatic-semantic information requires the formal definition of what cognitive linguists call blending (Pelyvás 2006).

Our first analysis in this section concerns *ugye* (see Figure 4 below), the pragmatic-semantic contribution of which can be defined by simply adding a single component to the four-component representation of the yes/no question, demonstrated in Figure 3. The component is responsible for expressing the speaker’s bias towards the positive answer.

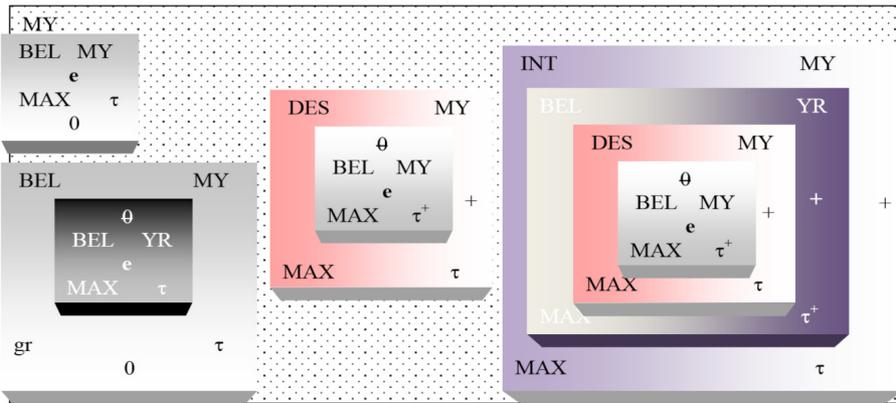


**Figure 4.** The intensional profile of the Hungarian question with *ugye*.

The content of the components in Figure 4, applied to the Hungarian sentence *Péter felhívta Marit, ugye?* ‘Péter called Mari.Acc *ugye*’ ‘Péter called Mari, didn’t he?’, is the same as 1–4 in Figure 3, plus “I consider it likely that Péter called Mari.”

It is no contradiction that the speaker conveys that (s)he is not absolutely sure that Péter called Mari but, at the same time, (s)he considers it quite likely. In our approach, different levels of knowledge (BEL/MAX vs. BEL/gr) can be evaluated separately.

Our analysis of the discourse particle *vajon* (see Figure 5 below), which it would be difficult to translate (roughly “I wonder”), is based on the observations of Gärtner and Gyuris (2012), Gyuris (2013), and Schirm (2011) that this special grammatical clue expresses “speculation,” “hesitation,” “uncertainty,” “curiosity,” and “reflection.” Its meaning—or rather, its pragmatic-semantic contribution—can be revealed by comparing its intensional profile to the intensional profile given in Figure 3, which shows differences in two components out of the four.



**Figure 5.** The intensional profile of the Hungarian question with *vajon*.

The content of the components in Figure 5, applied to the Hungarian sentence *Vajon Péter felhívta Mari-t?* ‘*Vajon Péter called Mari.Acc*’ ‘I wonder if Péter called Mari,’ is as follows: “1. I do not know if Péter called Mari. 2. *I consider it likely (unfortunately) that you do not know the truth either.* 3. I wish I knew the truth. 4. (*Why have I started the conversation, anyway?*) *I want you to know that I intend to acquire the given PoI.*”

Components 1 and 3 are common: the speaker, who does not know if a certain PoI is true or false, longs for this knowledge. Components 2 and 4 are new (cf. Figure 3). The speaker does not really hope that the hearer knows the answer; (s)he is only thinking aloud, with no immediate purpose. The only realistic purpose for him/her may be to make the hearer know that (s)he needs the answer.

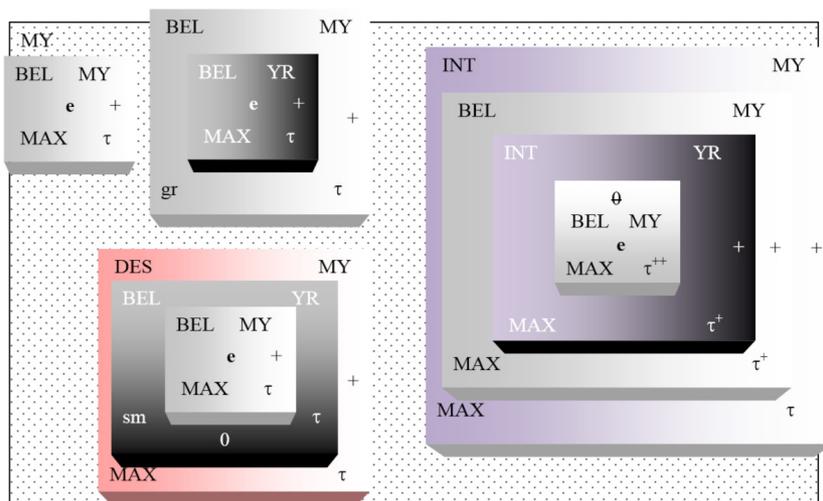
Again, if we address the division of labor between pragmatics and semantics, we could separate the at-issue meaning (coming from the original question) and the additional meaning (coming from the discourse particles). *Ugye* and *vajon*, discussed (briefly) above, bear the properties of conventional implicatures (Potts 2013; 2007), namely: semantic (lexical), independent (from at-issue content), secondary (supporting content—“fine-tuning”), not backgrounded (not part of the common ground), not deniable, and invariably speaker-oriented. In both cases, the at-issue meaning denotes whether Péter called Mari or not. As for *ugye*, the conventional implicature expresses bias toward the positive answer (“I consider it likely that Péter called Mari.”—as presented in the intensional profile in Figure 4); and as for *vajon*, the implicature translates (roughly) as “I wonder . . .” (elaborated in Figure 5).

#### 4. The Cast of Roles in Conversation, Which Overrides Everything

It is not only discourse particles (Section 3) that can block the basic meaning components demonstrated in Section 2 (which belong to the intensional profiles of the five

basic sentence types), forcing a wide range of alternative meaning components into these initial profiles. Taking the interlocutors' participant roles in the conversation into account can also yield such a domino effect.

What is the result of this domino effect, for instance, in the case of cross-examination between a detective and a suspect, when it is clear that it is not because of an appetite for information that the detective is asking questions? Figure 6 below provides the intensional profile of cross-examination. Components 1–3 express the preconditions for entering into cross-examination: there is a PoI shared by the detective and the suspect but in an asymmetric way, which confers an advantage on the detective: (s)he is aware of the fact that the suspect knows something, but not *vice versa*.



**Figure 6.** The intensional profile of cross-examination.

The content of the components in Figure 6, applied to the sentence *Péter felhívta Mari-t?* ‘Péter called Mari.Acc?’ ‘Has Péter called Mari?’ is as follows: “1. I know that Péter called Mari. 2. It is likely that you also know that. 3. I hope, nevertheless, that you are not aware of the fact that the given PoI is at my disposal, too. 4. I want to learn what you want me to believe in connection with Péter’s phone call.”

What, then, is the point of a question concerning something known by both the speaker and the hearer? In other words, what is the detective’s purpose instead of acquiring the PoI expressed by the utterance? The four-storey information box (component 4) is of a lifted type: compared to the basic case when the speaker wants the hearer to “want” him/her to learn something (Figure 3), now the speaker wants to learn what the hearer want him/her to “learn.”

With all the experiences about different kinds of questions collected in Sections 2–4, now we are in a position to conjecture a possible answer to the question raised in Section 3: how does the language, by means of its numerous tools, fill in the multidimensional matrix of the complete range of possibilities provided by formula (5) (see Section 1)? We hope that we have managed to convince the reader that at least three factors must be considered but their contributions can be calculated in the same system: sentence type, discourse particles/markers, and the cast of participant roles in conversation. In further papers (Alberti, Vadász, and Kleiber 2014; Vadász, Kleiber, and Alberti 2013; Alberti, Dóla, and Kleiber 2014) we demonstrate that similar, and hence computationally compatible, intensional profiles can be assigned—in all human languages—to certain verbs (see Section 1), auxiliaries, adjectives, adverbs, and different kinds of linguistic elements responsible for the expression of mood, modality, tense, and aspect.

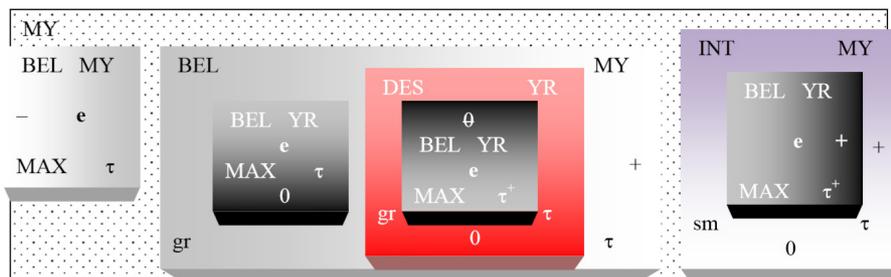
## 5. Unveiling the Speaker

It is not what is thought by the speaker that was outlined in Sections 2–4, but what is (intended to be) exhibited by him/her with the aid of the different grammatical clues. The two intensional profiles may be more or less different. The content of the speaker's thoughts coincides completely with that of his/her words only if (s)he is perfectly spontaneous, true, and relevant, that is, if (s)he behaves as an ideal speaker in a Gricean (1975) sense. Speakers, however, often use the grammatical facilities to achieve their manipulative intentions instead of simply expressing their intensional approach to certain PoIs. They can resort to fudging, lies, white lies, fibs, bluffing, and numerous other kinds of similar (more or less immoral) things. In our approach these different kinds of deception can all be defined straightforwardly as the difference between the intensional profile exhibited and the intensional profile that captures the speaker's real thoughts concerning the relevant PoI.

Explaining deception types, thus, has to be based upon the revelation of the basic system of linguistically expressed intensional profiles. The former investigation, however, can have obvious repercussions on the latter investigation because, as part of our mother-tongue competence, we have a more or less clear intuition about the meaning of such words as *white lie*, *fib*, *bluff*, etc.

It is quite obvious that the basic forms of *downright lie* and *bluff* are the easiest to define: the intensional profile of the declarative sentence (see Figure 2 in Section 2) should be paired with an intensional profile that can be produced by replacing nothing else but the positive polarity value in the first component of this profile with a negative or a zero polarity value, respectively. Anyone who is telling a lie or who bluffs assumes that the hearer, for instance, knows nothing about Péter's potential phone call to Mari (component 2), assumes that he/she longs for some information (component 3), and wants him or her to think that Péter did call Mari (component 4), *in spite of the fact that (s)he him-/herself does not think that* (cf. component 1).

Defining fibbing is more difficult, as is shown in Figure 7 below. We attempt to capture the relative harmlessness of fibs compared to lies by an appropriate definition of components 3 and 4, which pertain to the hearer’s assumed wish and the speaker’s related intention.



**Figure 7.** The definition of *fib* as a pair of the intensional profile provided in Figure 2 and this intensional profile.

The content of the components in Figure 7, applied to *Péter felhívta Mari* ‘Péter called Mari.Acc’ ‘Péter called Mari,’ is as follows: “1. I know that Péter did not call Mari. 2. I consider it likely that you do not know if Péter called Mari. 3. Nevertheless, I consider it likely that you do not need this PoI, since 4. I do not want you to ‘save’ this (false) PoI.”

Fibs are quite harmless because the speaker wants to cause no damage to the hearer. Typically, (s)he only wants to defend his/her own face. The precondition for causing no damage while telling a lie is what component 3 expresses: it is likely (fortunately) that the hearer is not interested in the PoI in question. Therefore, it seems to be quite riskless to supply the hearer with the superfluous information: (s)he is not likely to use it at any time, which is what the speaker sincerely hopes (component 4).

As for the definition of further kinds of deviations from the standard ideal-speaker role, the interested reader is referred to Alberti, Vadász, and Kleiber (2014); even such things as *killing the joke* are discussed in this paper.

## 6. Conclusions

Within the framework of REALIS, which has reorganized DRT via a radically new ontology, pragmatic and cognitive aspects of the process of communication which stretch a good deal beyond the traditional scope of formal semantics can be described in a well-formalized unit.

We have defined the pragmatio-semantic character of the five basic sentence types. We have also illustrated the role of a few discourse particles in modifying these basic profiles, “fine-tuning” them, and the “basic settlements.” A section has been

devoted to conversations with special casts of participant roles. Finally, an investigation has also been performed of how to capture the difference between what is said and what is thought.

Thus ReALIS is opening up new areas of formal description in exploiting the capabilities of the DRT-style information box hierarchy because this hierarchy not only serves the purpose of the “dynamic” reformulation of logical formulas but can also be assigned to all kinds of word- or sentence-level and linguistic or extra-linguistic factors that make any contribution to the ultimate meaning and use conditions of sentences and texts.

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# Multi-tier Transcription of Informal Spoken Czech: The ORTOFON Corpus Approach

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**Abstract:** The ORTOFON spoken corpus is currently in the stage of data collection and annotation and will feature two main tiers of transcription: the ort layer (which is more or less orthographical) and the fon layer (which contains a simplified phonetic transcript). The recordings target prototypical spoken language as instantiated in informal conversations among people who know each other and are situated in their usual environment. Like previous spoken corpora, ORTOFON will be balanced with respect to several sociolinguistic categories of the speakers who are included: gender, age, education, and dialect region of childhood residence. By offering a detailed multi-tier transcript (including orthographic, phonetic, and meta-linguistic layers), we aim to capture interactions in a comprehensive way in the context of a given communication situation. Examples will illustrate the specific features of our transcription guidelines.

**Keywords:** spoken corpus; corpus annotation; transcription; Czech; informal interactions

## 1. Introduction

This paper introduces the procedure of spoken data transcription used in a new corpus of informal spoken language. The new ORTOFON corpus will be part of the Czech National Corpus project. The collection of recordings of informal spoken interactions for the new corpus started in 2012 and the ORTOFON corpus is expected to be finished by 2016. The size of the corpus will be 1,000,000 words, which means

about 110 hours of recordings. The data in the ORTOFON corpus will benefit from a multi-tier annotation.

## **2. Spoken Corpora of Czech and Their Transcription Systems**

The first corpus of spoken Czech language was the Prague Spoken Corpus (PSC), whose recordings span the years 1988–92 and were made in the Prague area only. Its size is 819,267 tokens in 193 formal and 103 informal recordings (see Čermák et al. 2007, 11f.). The transcription is literary (in the tradition of folkloristics), with punctuation following the usual syntactical rules of the written language. The corpus is balanced with respect to four sociolinguistic categories characterizing the speakers and their interactions: sex, highest level of education attained (tertiary × non-tertiary), age group (under 35 years old × over 35 years old) and the formality of the situation (informal × formal, i.e., controlled dialog). The transcription and design criteria pioneered by the PSC formed the basis for several subsequent corpora of spoken Czech which were built at the Institute of the Czech National Corpus (ICNC). The same design criteria were also used for the Brno Spoken Corpus, which was recorded in Brno during the years 1994–99 (see Hladká 2002). In this project, however, the transcription was updated so that the punctuation reflected the speakers' actual pauses instead of syntactic boundaries.

### **2.1 The ORAL Series Corpora**

The ICNC started collecting recordings of spontaneous spoken Czech conversations between speakers from different parts of the Czech Republic in 2002. This data collection effort focused solely on informal situations, meaning that the speakers were required to know each other and speak together in their usual, everyday manner. In addition to the previously tracked sociolinguistic categories of the speaker mentioned above (sex, level of education, age), the region of origin was taken into account as well.

The first corpus resulting from this endeavor is ORAL2006 (Kopřivová and Waclawičová 2006; Waclawičová 2007). It contains 1,000,798 tokens in 112 hours of recordings restricted to the region of Bohemia. The second corpus, ORAL2008 (Waclawičová et al. 2010), is balanced across all sociolinguistic categories; its size is 1,000,097 tokens and 115 hours. The four corpora mentioned up to this point (PSC, BSC, ORAL2006, and ORAL2008) contain only transcriptions; the recordings are not user-accessible. By contrast, the next and currently the last corpus in the ORAL series, ORAL2013 (Válková et al. 2012), provides access to the actual recordings aligned with a one-tier transcript. It is also the first to have been collected in all areas of the Czech Republic. This corpus contains 2,785,189 tokens in 291 hours of recordings.

## 2.2 Other Corpora of Spoken Czech and Their Transcription Systems

The DIALOG corpus (see Kaderka and Svobodová 2006; Čmejrková and Hoffmanová 2011) uses a transcription system similar to that of the ORAL series corpora, with several modifications. By contrast, the Prague Dependency Treebank of Spoken Language, which is based on recordings of Holocaust survivor narratives from the Malach project, takes the initial transcript of the recording and attempts to reconstruct a standard language version of it, which is then used for subsequent syntactic annotation (Mikulová and Uřešová 2008). A number of corpora, such as the Prague Phonetic Corpus (Volín et al. 2008), the MONOLOG corpus (Štěpánová 2011; 2013), the Nijmegen Corpus of Casual Czech (Ernestus et al. 2014), or the Olomouc-based corpora OSC-OL and OSC-CZ (Pořízka 2009a; 2009b), employ a non-adapted orthographic transcript, closely following the rules of Standard Czech, which is then augmented with an additional phonetic annotation layer (OSC), and sometimes even more detailed segmentation into prosodic words and intonation units (PPC).

Somewhat different in terms of purview, the SCHOLA2010 corpus focuses on a school setting and captures the speech of both teachers and pupils as instantiated during classes (mostly standard-length lessons of about 45 minutes each). Its main difference from corpora published within the framework of the Czech National Corpus (CNC) consists in that it also features child and adolescent speech and focuses on a formal setting.

The SCHOLA2010 corpus comprises 204 transcripts of school lessons recorded from 2005 to 2008. The total length of the recorded audio material is over 143 hours and corresponds to 792,764 words. The corpus project targeted primary schools, grammar schools (the so-called “gymnázia”) and secondary vocational schools. The rules for transcribing the lessons were put together on the basis of the principles followed by the ORAL series corpora, with slight adaptations. Apart from Standard Czech, the transcripts quite often also contain Common Czech, and even regionalisms appear from time to time.

A summary of the corpora of spoken Czech discussed so far is presented in Table 1.

| Corpus  | Size  |           | Time span     | Institution  |
|---|-------|-----------|---------------|--|
|   | Hours | Words     |               |  |
| BMK   | 55    | 490,000   | 1994–99       | Faculty of Arts,<br>Masaryk University,<br>Brno  |
| Olomouc Spoken<br>Corpus-OL                         | 140   | 1,500,000 | 2002–ongoing  | Faculty of Arts,<br>Palacký University,<br>Olomouc   |
| Olomouc Spoken<br>Corpus-CZ                         | 220   | 2,000,000 | 2010–ongoing? | Faculty of Arts,<br>Palacký University,<br>Olomouc   |
| DIALOG  | 110   | 932,373   | 1997–2010     | The Institute of the<br>Czech Language of the<br>Academy of Sciences<br>of the Czech Republic  |
| Prague Dependency<br>Treebank of Spoken<br>Language | 1260  |           | 1993–99       | Faculty of<br>Mathematics and<br>Physics, Charles<br>University, Prague  |
| Prague Phonetic<br>Corpus                           |       |           |               | Faculty of Arts,<br>Charles University,<br>Prague  |
| Nijmegen Corpus<br>of Casual Czech                  | 30    | 361,977   |               | Max Planck Institute<br>for Psycholinguistics,<br>Nijmegen   |
| MONOLOG   | 5     | 40,000    | 2010–12       | Faculty of Arts,<br>Charles University,<br>Prague + The Institute<br>of the Czech Language<br>of the Academy of<br>Sciences of the Czech<br>Republic |
| SCHOLA  | 143   | 792,764   | 2005–8        | Faculty of Arts,<br>Charles University,<br>Prague  |

**Table 1.** A summary of currently available corpora of spoken Czech.

## 2.3 Transcription Procedure for Spoken Czech Language at the ICNC: An Overview

Transcription and annotation is the crux of spoken language research (see Ehlich and Rehbein 1976; Goedertier et al. 2000), making the speech data accessible in text form and thus conveniently searchable. One-tier transcription is always a compromise between simplicity and accuracy. User-friendly and intuitive access to the data is paramount in corpus querying: it was the main reason for the simple transcription rules used in the PSC.

The SYN series of written Czech corpora (the flagship of the ICNC) also captures some word forms typical of spoken language (especially in fiction and newspaper interviews), which means that a conventional way of representing these non-standard linguistic items exists. The same way was thus adopted in the transcription approach used by the PSC. For the same reason, punctuation too was used in a way that conformed to the rules for its use in written language. This facilitates the comparison of spoken and written language. This made sense, because the main goal of the PSC was to extend research in lexicology and morphology.

When the collection of recordings was extended to other parts of the Czech Republic, the number of regional, dialectal, and slang words, as well as of lexical and morphological variants, increased. For this reason, the transcription rules were changed. All of the corpora in the ORAL series use one-tier transcription which tries to capture the most important specifics of the spoken language (in addition, the transcripts of the ORAL2013 corpus were manually aligned with audio using the Transcriber software tool; Geoffrois et al. 2000). This revised approach, while being more faithful in its reflection of the wealth of variation afforded by spoken language, brings many problems in terms of searching the resulting corpora, such as an explosion of possible variants, which make it harder to construct queries that reliably return all instances of what is underlyingly the same word, or conflicting word segmentations. For instance, there are many variants of pronouns (especially deictics) in spontaneous spoken Czech and the editors often transcribe them in different ways, e.g., *tudlensto*, *tudlencto*, *todlencto*, *todlensto*, *tohleto* × *tohle to*. The meaning may not be exactly the same but it is not always clear from the utterance. Formally reduced variants of words are transcribed only for very frequent words which are explicitly enumerated in a special list (for example *půjde* – *pude*, but not *pue*); the remaining words are always transcribed in their full form even if their pronunciation contains elisions or reductions.

These problems can be solved by adopting a multi-tier transcription setup, which is the path taken by the new ORTOFON corpus. In the context of corpora of spoken Czech for general linguistic research, this approach was pioneered by the OSC, and one of the possibilities was thus to borrow its tried and tested transcription guidelines (Pofízka 2009b). However, after careful deliberation, this option was abandoned for several reasons:

1. Out of consideration for the users, who are used to working with the current “extended orthographic” transcription system and might want to track morphological and lexical variants in spoken language without having to familiarize themselves with phonetic transcription
2. A simplification of the transcription process for the transcribers, who are mostly non-linguists (they transcribe the recordings they themselves have collected)
3. The possibility of using the same transcription system in the orthographic layer of the DIALEKT dialectal corpus (Kopřivová et al. 2014)

The new multi-tier annotation scheme thus features a “relaxed” orthographic layer (capturing more spoken language variation than the strictly standard OSC rules, but less—i.e., being somewhat more uniform—than the ORAL series rules) and a simplified phonetic layer (capturing additional phonetic detail); the main aspects of both will be presented below. A third tier then contains information concerning paralinguistic events such as whispering, laughing etc.

### **3. The ORTOFON Corpus**

#### **3.1 Data Collection**

The data material for the ORTOFON corpus consists of recordings of prototypical spoken language (Čermák 2009, 118), which is defined as informal conversation between well-acquainted parties in a casual setting. The speakers know each other and appear in their usual roles, with only our associate (the recorder) being aware of the conversation being recorded. The interactions take place in familiar environments (e.g., in private, among friends, etc.) and the situations are not experimentally induced. We only record the speech of adult speakers (18+ years old).

#### **3.2 Metadata**

Our external collaborators who record and transcribe the conversations are asked to provide a variety of metadata along with each recording, spanning the two broad categories of situation and speaker characteristics as outlined by Crowdy (1993), his own terms being the “context-governed” and “demographic” perspectives. These are fairly detailed and should enable users to filter for specific types of extralinguistic context and, provided that enough material matches their search criteria, to create subcorpora based on them. A coarse-grained subset of this information will be used for the sociolinguistic balancing of the corpus. The main target is to capture all the factors which can influence the communication situation.

##### **3.2.1 Situation**

Each recording contains information about the situation in which it was made. There is a forced choice of primary situation type from a list of 12 pre-defined categories, which

are designed to distinguish, from among the different possible settings in which the recording could have taken place, those that are of interest:

1. At home
2. At home during a meal
3. At home during a joint activity
4. Public transport
5. Visit
6. Informal chat at work/school
7. Celebration
8. Garden/cottage conversation
9. Restaurant/pub
10. On the street/at a public transport stop
11. Tabletop, role-playing, or similar game
12. Phone or VoIP conversation<sup>1</sup>

Apart from situation type, the collaborators are asked to summarize the major conversation topics (using free-form keywords) and specify the relationships between the speakers (one of partners, family, friends, acquaintances, or strangers), as well as the total number of generations they represent (e.g., a child, her mother, and her grandmother = three generations). The collaborator should also fill in if s/he was physically present during the recording. Another requirement is to enter the date, place, and corresponding geographical area of the recording location (the geographical areas are based on dialect areas which follow Balhar et al. 1992; see Figure 1). This is potentially relevant for speakers from the more dialectally diversified regions in the east of the country (Moravia and Silesia), who in some cases tend to avoid regionally marked variants in their speech when in the more dialectally uniform west (Bohemia). For an interesting study of this phenomenon, see Wilson (2010).

An impressionistic assessment of the sound quality of the recording is also stored, which is useful because of the phonetic transcription stage. Some primary situation types are noisy by definition (e.g., restaurant, public transport, or on the street).

### 3.2.2 Speaker Characteristics

In addition, information about the number and unique identities of speakers is associated with every recording. Therefore we are able to detect the different recordings in which a given speaker appears and how many of them there are, allowing us to regulate over-represented speakers and thus maintain a diverse range of participants.

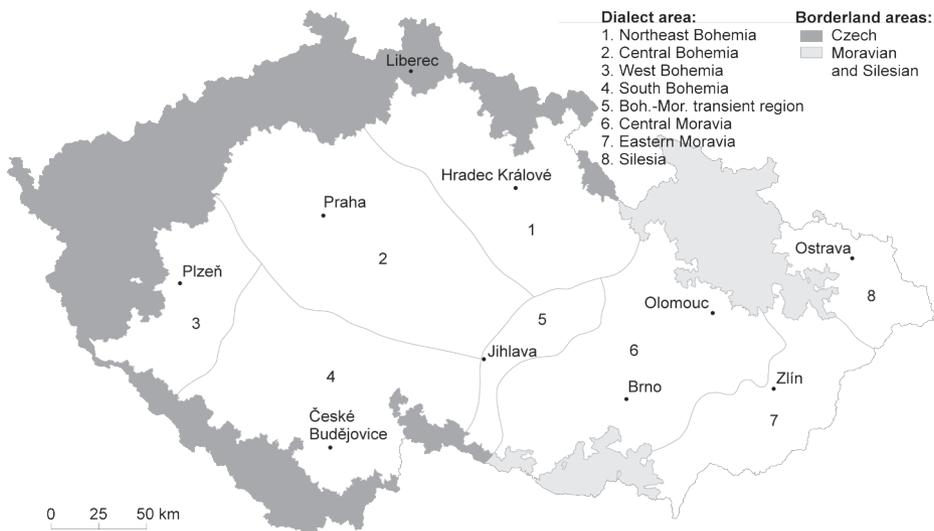
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<sup>1</sup> Items one through eleven are carried over from the ORAL series; type 12 was newly added in ORTOFON.

Only stable speaker characteristics are being consistently tracked. These include:

- age
- gender
- level of education (highest achieved) and field
- current and longest occupation
- childhood, longest and current region and place of residence, and size of the corresponding dwelling
- common speech defects

The region of residence category is structured according to traditional dialect regions as outlined in Figure 1. Note that the borderland regions (shaded areas) are problematic from a dialectological point of view (Balhar et al. 2011, 10), as a substantial part of the original population, predominantly German-speaking, was deported as a consequence of post-Second World War ethnic cleansing and replaced with Czech-speaking settlers from all over the country (Kastner 1996).



**Figure 1.** Map of the dialect regions of Czech, following Balhar et al. (1992)

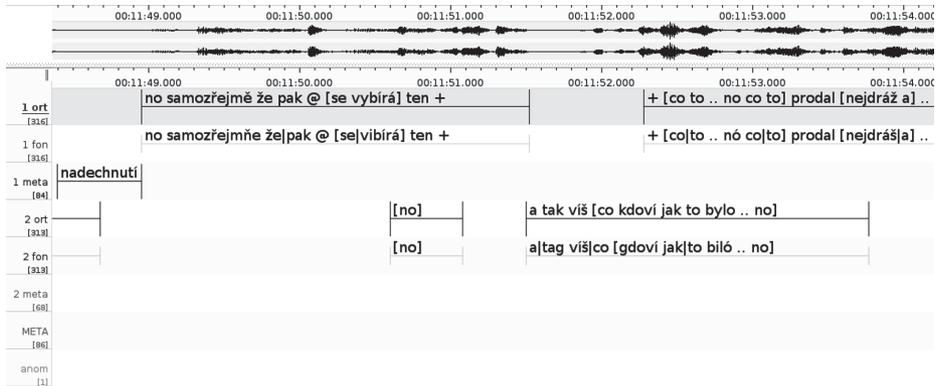
### 3.3 Representativeness and Balancing

During the future process of the selection of recordings for the final published version of the corpus, speakers will be chosen with respect to several sociolinguistic categories: gender, age, education, and dialect region of childhood residence. The goal is to

make the corpus representative (i.e., it should include speakers reflecting all possible combinations of the sociolinguistic variables) and as balanced as possible (i.e., the proportions of the different categories should be roughly equal). We are also trying to diversify the recording locations within the respective regions.

#### 4. Annotation Scheme in the ORTOFON Corpus

The main difference setting the ORTOFON corpus apart from the ORAL series corpora is multi-tier annotation, which attempts to capture a multitude of relevant aspects of spoken language. Every recording is transcribed using the ELAN linguistic transcription software<sup>2</sup> (Sloetjes and Wittenburg 2008). Consequently, a different approach to transcription was employed, compared to the previous installments in the ORAL series. There are two main types of tier (roughly corresponding to orthographic and phonetic; see below) and each speaker in the conversation gets his or her own private instance of both of them, which means that any overlaps may be conveniently transcribed in parallel on the respective independent layers. Speakers' turns are segmented into sub-units of a maximum length of 25 tokens for increased clarity and ease of parallel revision.



**Figure 2.** Excerpt from a transcript for the ORTOFON corpus in the ELAN transcription program, showing the recording waveform at the top with time-aligned orthographic, phonetic, and metalinguistic tiers for speaker 1 (1 ort, 1 fon, 1 meta) and 2 (2 ort, 2 fon, 2 meta). The additional tiers are META (for ambient sounds and context-related information) and anom (anonymization layer). For commentary on the orthographic transcription see § 4.1 and § 4.2, for phonetic transcription see § 4.3.

<sup>2</sup> ELAN is being developed at the Max Planck Institute for Psycholinguistics, The Language Archive, Nijmegen, The Netherlands; URL: <http://tla.mpi.nl/tools/tla-tools/elan/>.

The multi-tier transcription is shown in Figure 2. The first tier (ort) carries a transcript which mostly sticks close to Czech orthography (much more so than in the case of the ORAL series; see § 2.3), enriched with selected regional phonetic and lexical variations. False starts, pauses, and hesitations are also marked, as are the boundaries of overlapping speech. The second tier (fon) uses a simplified and adapted form of phonetic transcription, which was designed with the amount of data to be transcribed and accessibility for the corpus user in mind. Basic search and lemmatization will rely on the orthographic layer, but the phonetic layer will be searchable as well. Alongside the two main tiers (orthographic and phonetic), auxiliary layers also capture concomitant acoustic events such as non-verbal (meta) or ambient sounds (META). Each speaker is associated with their own meta tier, which captures, e.g., laughter, smacking of the lips, hiccups, or pauses longer than two seconds, i.e., paralinguistic sounds pertaining to a specific speaker. By contrast, there is only one META tier in every recording, whose purpose is to capture other ambient sounds, e.g., dishes clinking, dogs barking, or phones ringing. Both the meta and META tiers offer a list of pre-defined categories. Another layer is used for the anonymization of personal data (e.g., phone numbers, surnames, and addresses).

#### 4.1 Orthographic Transcription

The basic tier of our annotation scheme is the orthographic tier (abbreviated ort). The ort layer is optimized to allow a reasonably quick first transcription of the sound recording. Despite it being termed “orthographic,” it does not opt for standard linguistic variants in every case, but has several specific differences in this respect. For instance, it preserves the quantity of vowels according to standard Czech and all consonants in consonantal clusters (regardless of real pronunciation), but on the other hand, it reflects dialectal features: deviations in quality in the pronunciation of vowels, variation in the endings of all types of declination and conjugation, etc.

Examples of phenomena captured on the orthographic tier include:

- regional variation vocalic changes: *cejtit* or *cétit* (instead of the standard form *cítit*)
- prothetic consonants: *vokno*, *vona*, *hulica*
- regional declination variants: *hulica* (instead of *ulice*) *já jsem jel po tém Vídňu s tým fiatem* (*jel jsem po té Vidni s tím fiatem*)
- regional conjugation variants: *sú*, *hořjó* (instead of *jsou*, *hoří*), *to by moh Petr udělat, takže chcu říct* (*to by mohl Petr udělat, takže chci říct*)

The carefully negotiated trade-off between standard spelling and variation makes it possible to track the spatial distribution of these features in a fairly straightforward way while providing a transcription which is less unpredictable than the one employed in the ORAL series

A very important requirement is to ensure that the transcription procedure is homogeneous across different recordings, which already span over two years. For this purpose, we worked out a detailed manual for all our collaborators where they can find examples and general rules for transcription. This manual is continuously being updated with additional examples gleaned from the material.

## 4.2 Special Symbols Used in the Orthographic Transcription

For a richer representation of the information contained in the material, we have recourse to several symbols with a special meaning and three types of brackets. The purpose of using this varied range of different symbols is to capture interactions in a comprehensive way in the context of a given communication situation and provide researchers with important information connected with informal (unscripted) communication.

The following is a list of the symbols used, together with their meanings:

- \* unfinished words: *koč\* kočka do vody*
- # enclitic -s: *co #s dělal ?*
- @ hesitation
- pausal punctuation: . and .. (with the exception of pauses longer than two seconds, which are marked on the meta tier)
- questions are denoted by appending ? to the utterance
- response sounds: assenting **hmm**, dissenting **emm**, interjection **&** (the symbol **&** is entered on the ort tier and the precise nature of the interjection is specified on the meta tier by choosing from a pre-defined list of possibilities, e.g., surprise, shock, etc.)
- – interrupted utterance which does not resume at a later point in the conversation (in the speaker's next turn)
- + utterance interrupted by another speaker but then continuously resumed in the speaker's next turn (we understand continuity as carrying on with the same theme and syntactically tying into the part of the sentence prior to its interruption)

The symbol + has some additional but closely related meanings; all in all, it can occur in three positions:

- at the end of one speaker's interrupted utterance and at the beginning of his/her next utterance
- at the end of one speaker's interrupted utterance and at the beginning of another speaker's follow-up utterance which completes the sentence (e.g., when the first speaker is unable to remember some word and another speaker intervenes and fills in the rest of the sentence for him/her)

- at the end of one speaker's interrupted utterance, at the beginning of another speaker's follow-up utterance, and again at the beginning of the next utterance of the first speaker if it completes the previously suspended sentence as well (e.g., the first speaker is unable to recall a particular word, the second speaker fills it in, and the first speaker repeats it)

The three types of brackets employed have the following interpretation:

- poorly intelligible words are enclosed with parentheses (); if the words cannot be understood at all, a number inside the parentheses signals an estimate of how many there are: *kecáš je to . (prej) dobrý (2)*
- square brackets [] mark overlapping speech, which is very frequent in spoken dialogical communication; the boundaries of overlapping speech are always placed at word boundaries, although the words can overlap only partially (e.g., only the first syllable):  
*0 ort: představ si že jsem včera šla [do školy] prostě*  
*1 ort: [no nekecej]*
- angle brackets <> signalize units uttered with a concomitant paralinguistic feature (e.g., laugh, yawn, whisper): *to si děláš srandu <SM to snad ne> . to není možný*

### 4.3 Phonetic Transcription

More pronunciation details are available via the linked fon layer, which is an innovation compared to the ORAL series.

Devising an appropriate phonetic transcription system has not been entirely straightforward. Phonetic annotation by hand requires either highly trained transcribers or a vastly simplified transcription apparatus; we opted for a middle road, i.e., a moderately complex transcription system (isomorphic with a subset of the International Phonetic Alphabet) and training our transcribers (some of whom already have some background in phonetics) as we go by way of tutorials and extensive feedback.

The phonetic transcription does not aim to capture all phonetic variation (e.g., vowel quality changes are mostly limited to reduction), but still offers rudimentary pointers to a variety of connected speech processes (Farnetani and Recasens 2010, 322). It is closely integrated with the ort tier but it has its own rules, which allow us to capture the following phenomena, sometimes with the aid of additional characters and symbols (in the example pairs, the first half corresponds to the ort layer and the second to fon):

- some non-phonemic distinctions, e.g., labiodental [m] or velar [ŋ]: *prosím vás × sim|vás, banka × ban|ka*
- assimilations of voicing: *kup mi to × kub|mi|to, tvoje × tfoe*

- assimilations of place of articulation: *hodně* × *hod'ňe* (see also examples under non-phonemic distinctions above)
- assimilations of manner of articulation: *od nás* × *on|nás*
- stress group boundaries: *dnes jsem se dobře vyspal* × *dne\_|sem|se dobře vispal<sup>3</sup>*
- epentheses and elisions: *zhasnout* × *zhastnout*, *protože* × *bže*

### 4.3.1 Challenges of the phonetic transcription

The transcription must negotiate between several conflicting requirements:

- to capture the real pronunciation as faithfully as possible (requires detail)
- searchability of the corpus (requires generalization)—it would be cumbersome to make concordances from the phonetic layer if transcriptions were overly individualized and detailed (i.e., if too few tokens ended up with the same or a predictably similar transcription)
- to enable non-phoneticians to pick up the transcription rules quickly as they go (requires simplicity)

The crux of the problem is that simplifying the transcription system means biasing it towards phenomena we are keen on capturing, or simply those we already happen to know about, and sidelining those we care less about or whose existence and/or relevance we are so far ignorant of. Yet at the same time, we would like the transcription to remain as faithful and objective as possible, so that the corpus will be general enough to be useful for studying even phenomena we are not necessarily already aware of.

## 5. Conclusion

The ORTOFON corpus builds on a long tradition of spoken corpora affiliated with the ICNC, starting with PSC and developing through the lineage of the ORAL series corpora. As we identify the problems and specific challenges pertaining to the collection and processing of data on spoken Czech, we are constantly trying to address them by adapting our methods, while at the same time introducing as few changes as possible that represent a break from past practice. We are also keenly aware that there are other institutions out there producing corpora of spoken Czech and strive to remain up to date concerning the status of their projects, as many of them frequently come up with interesting ideas and approaches.

<sup>3</sup> Some orthographic words are merged into prosodic words (or stress groups) on the phonetic tiers, but the space between them is not simply removed. Instead, it is replaced with the pipe | symbol, so as to preserve information about the location of the orthographic boundary and, by extension, a one-to-one correspondence between the tokens on the two tiers. This will allow search query constraints to target both tiers simultaneously, providing the users with more control over their search results. The underscore \_ symbol indicates that the following phone is shared by two orthographic words.

The major change in the ORTOFON corpus, compared with the previous ORAL series corpora, is the switch to a multi-tier annotation scheme. The basic layer is an “extended” orthographic transcript, augmented with a parallel phonetic transcription and paralinguistic annotation; every speaker gets his/her own instance of these three tiers. The basic transcript reflects some additional, mainly dialectal variation compared to standard orthography, but much less so than in the ORAL series corpora. This should lead to easier querying, and should ultimately also facilitate lemmatization and tagging, which are long-standing items on the to-do list for spoken corpora at the ICNC. However, phonetic details are not discarded; on the contrary, they are even more accurately recorded on the dedicated phonetic layer. The corpus is expected to be released to the public by the end of 2016.

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# Impersonal Sentences in English Scholarly Texts in the Humanities: Typology and Frequency (with Some Remarks on Pragmatics)

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**Abstract:** This paper presents a classification of various syntactic constructions with the impersonal element *it* and the frequency of their occurrence in English scholarly texts across different disciplines within the field of the humanities, and attempts to define their pragmatic functions. It has been established that these structures are widely employed in the texts that are analyzed, and at the same time their typology and frequency vary from discipline to discipline. Other observations are that such constructions are always connected not only with the information structure, but also with evaluation (except for clefts)—either modal or axiological, with the foregrounding of this evaluation and with abolishing its logical subject, and contribute to dialogism and heteroglossia. They also serve as a device in the process of hedging. The syntax-pragmatics interface of the structures that are defined (which so far has not been analyzed in great detail) opens up prospects for further study.

**Keywords:** impersonal syntactic construction; introductory *it*; cleft; evaluation; hedging; information structure.

## 1. Introduction

The need to study the peculiarities of scientific texts is growing with the development of science and academic communication. Despite the growing interest in the text, the sentence remains one of the most important subjects in linguistic theory. The analysis of a text is not possible without the analysis of the sentences that it is made of. One of the characteristic features of academic discourse is its impersonality, aiming at objectivity.

The study of impersonal sentences in the English language likewise does not lose its topicality as a result of the lack of an unambiguous interpretation of this linguistic phenomenon, which presents us with an opportunity to refer to this problem again.

Sentences with an *it*-element have been a productive area of studies, but mainly in terms of their information structure and extraposition syntactic processes (Quirk and Greenbaum 1973; Wekker and Haegeman 1996; Green 2006; Ward and Birner 2006), while the diversity of their structural features and their impersonal nature (Möhlig-Falke 2012), semantics, and pragmatic functions have often been overlooked. This paper presents a classification of various syntactic constructions with the impersonal element *it* and the frequency of their occurrence in English scholarly texts across different disciplines within the field of the humanities, with insights into their pragmatic functioning.

## 2. Data and Procedure

The paper presents a research study based on a corpus of 85 texts (2,000 pages), articles and book excerpts, in seven disciplines: History (H), Linguistics (L), Literary Criticism (LC), Art Criticism (AC), Political Science (PS), Sociology (S), and Philosophy (Ph). We selected all the sentences with an *it*-element from the texts under analysis, and then separated those with a desemantized *it* from those with its grammatical homonyms (e.g., the personal pronoun *it* with deictic meaning). The impersonal sentences collected from these texts were classified according to their structure and semantics, first into three main groups (impersonal proper, with introductory *it*, and clefts), and then into further subcategories according to their structure. Then the frequency of the constructions was calculated (with the raw numbers later being converted into their frequency per 1,000 words for comparison of the texts in different disciplines, which are of different sizes. We divided the texts by discipline in order to examine whether the frequency and typology of the constructions are the same in all the humanities or depend on the discipline (and according to the results of our research there are certain differences). The conclusions about the pragmatic functioning of the impersonal constructions were made on the basis of the data gained in the course of the analysis.

## 3. Theoretical Interpretation of the Structure of Impersonal Sentences and Their Semantics

The question of impersonal sentences remains important in the studies of English grammar, as it is not fully understood what types of sentences in the English language are to be considered impersonal, and additionally there are divergent opinions regarding their semantics, logic, and structure. The peculiarity of impersonal sentences is that the leading term in them means an action or condition that is thought of as independent of any action of the agent or experiencer of the state that occurs on its own. No structural or semantic or logical (as developed by analytical philosophers)

approach to the study of impersonal sentences alone can explain their nature and characteristics, which are determined by the specificity of their form, semantics, and the contextual environment. The specific nature of impersonal sentences is generated by the interaction of semantic and grammatical factors operating within impersonal structures; their actual meaning and pragmatic role are defined by the context of the neighboring sentences, speech situation, and the nature of the secondary parts of the sentence (if there are any).

The peculiar feature of impersonal sentences in the English language is that formally they are two-part (unlike, for example, Ukrainian or some other Slavonic languages, where impersonal sentences are always one-part in structure), as in (1a)–(1c). This fact complicates the process of definition and classification, as the formally present subject creates a discrepancy between the grammatical and logical aspects of the sentence. Sentences without a subject in English are mostly found in the imperative mood, while, for example, in Ukrainian they are possible in the third person as well, which can be seen in (2a)–(2c). The logical subject indicates what the predication refers to. However, it is sometimes difficult to determine the logical (or semantic) counterpart of the grammatical subject. This is partly due to the formal characteristics of the English verb (a decrease in the number of verb forms and the number of persons and an increase in the number of their homonyms). As has been noted, the characteristic feature of English sentences is that they always contain a subject. This grammatical subject, however, indicates no real (notional) subject: the content of the subject becomes, as it were, dissolved in the meaning of the predicate and cannot be extracted from it and considered by itself. This subject can be called impersonal. Thus, impersonality in English is expressed not by the formal lack of a subject, but by its lack of a semantic load. This purely formal element “it,” which occupies the position of the subject, loses the essence of a personal pronoun with deictic meaning and becomes its homonym.

- (1) (a) It is dark.  
 (b) It is getting dark.  
 (c) It is necessary to go there.
- (2) (a) Temno.  
 darkly  
 It is dark.  
 (b) Temnije.  
 get dark.PRESENT.3SING.  
 It is getting dark.

- |     |                              |       |        |
|-----|------------------------------|-------|--------|
| (c) | Neobhidno                    | pity  | tudy.  |
|     | it is necessary.ADV          | to go | there. |
|     | It is necessary to go there. |       |        |

Let us now consider impersonal sentences in terms of their structural syntax. In Tesnière's (1959) theory of syntactic valence the role of the structural center of a sentence is attributed to a verb. In this respect Tesnière's grammar is different from traditional or generative grammar, where the center is a subject (subject group) and a predicate (predicate group). The verb governs all the members of the sentence that are grammatically dependent on it. By analogy with the chemical valence principle, the verb can be compared with an atom, to which other atoms can be attached. The number of actants that can connect to a verb is called its valence. Three actants (elements dependent on a verb) is the highest possible valency of a verb. In traditional syntax they correspond to the subject and direct and indirect objects (Busch and Stenschke 2007, 136–40). Impersonal verbs are viewed as being of zero valence. It follows that in such cases *it* performs a purely formal function, which is to fill the place of the subject (necessary in the structure of an English sentence), but it is desemanticized. If the sentence can be subjected to transformation into a sentence without an *it-construction*, as in (3), then *it* is marked as a Placeholder in the structural scheme of the sentence; if such a transformation is impossible, as in (4), then *it* is marked as a part of the verb group in the main clause (*It seems to me*), with reference to which the subordinate clause serves as an accusative complement and is not separated from the verb group (the same as sentences with formal *es* in German (Busch and Stenschke 2007, 175–76).

- (2) It is not necessary to refer to the terms of that section. [BNC FDM 83] → To refer to the terms of that section is not necessary.
- (3) It seems to me that the Dinka language, unlike modern, educated, and for the most part metropolitan English, compels its speakers to integrate the moral and physical attributes of persons together within the physical matrix of the human body. [BNC EA3 947] (≠ \* That the Dinka language . . . compels its speakers to integrate the moral and physical attributes of persons together within the physical matrix of the human body seems to me)

A desemanticized *it*-element in the sentences which can be transformed into those without an *it*-element, as in (4), is referred to as *introductory/anticipatory it*. It is often explained in terms of information structure and extraposition processes (Wekker and Haegeman 1996; Green 2006; Ward and Birner 2006): there is an obvious imbalance between the heavy subject and relatively small predicate in the

transform in (3), and the subject represents new information, which, without the *it*-construction, appears at the beginning of the sentence, making it difficult to read. It follows that in such cases *it* performs a purely formal function in the sentence, while the notional (semantic) subject is either the object complex or the subordinate clause (depending on the sentence).

Considering various approaches to the interpretation of the sentence structure, we can say that impersonal sentences in English have the following peculiarities. The grammatical subject is semantically defective (desemanticized) and it does not correspond to any agent (or other subject of the action in the real world). Being formally made up of two constituents, such sentences deviate from the structure of sentences with two main constituents (subject and predicate), as the grammatical subject does not correspond to the logical one, and neither does the predicate. That is why a purely grammatical or semantic approach is not sufficient to study this type of sentence, since it would enclose us in a vicious circle. However, both of these approaches are necessary in order to investigate their nature. A new perspective opens up to us from the point of pragmatics and their functioning in discourse, and we shall discuss these in time, but, for now, we will remain with structure.

## 4. Typology and Frequency of Impersonal *It*-Constructions in English Scholarly Texts in the Humanities

### 4.1 Impersonal Sentences Proper

In impersonal sentences proper the predicate is expressed by an impersonal verb, or a personal one used with an impersonal meaning. In earlier periods of English such constructions were possible even without a grammatical subject (Möhlig-Falke 2012, 16), for example: verbs denoting natural phenomena (*rinð* “it rains”); verbs denoting physical sensations (*achen* “to ache,” *calan* “to be/become cool/cold”); verbs indicating emotional feelings and states (*gleden* “to make glad”; *gomene* “to amuse, delight”); physical and mental activities and states of the human body (*tweogan* “to doubt”; *Dunkan* “to seem, to appear”); relevance or acceptability (*availen* “to be of use or advantage to”), and verbs associated with the concept of fate (*mistiden* “to turn out ill”; *getimian*, *timan* “to happen”). The decline of inflections led to the strengthening of the role of word order in the sentence, in particular, to the establishment of the “subject-verb-object” (SVO) order, the loss of structures with the object preceding the verb, and, consequently, the need for a grammatical subject (Möhlig-Falke 2012, 16). Thus, the appearance of impersonal constructions can be explained by the combination of several factors: morphological, syntactic, semantic, and discourse-pragmatic.

On the basis of the texts that were analyzed we can suggest the following types of impersonal sentences:

- (i) Sentences with the leading term expressed by an impersonal verb (e.g., *rain, snow, freeze, drizzle*);
  - (ii) Sentences with a nominal predicate providing information about the weather or the state of the environment (e.g., *It is warm. It is getting dark. It is summer.*);
  - (iii) sentences describing time and distance (e.g., *It is five o'clock. It is five km to the nearest town.*);
  - (iv) sentences with a simple verbal predicate expressed by the personal verbs *seem, appear, happen, or turn out* with an impersonal meaning, which are not subject to transformation into similar ones without the grammatical subject *it*, such as in (5a)–(5e):
- (5) (a) It turns out that a great deal of our conversational interaction involves the repetitious use of structure. [BNC HGH 169] →\*That a great deal of our conversational interaction involves the repetitious use of structure turns out to be.
- (b) It happens that only the last of these verb phrases is standard English. [BNC CBR1434].
- (c) It appears the Germans are taking over the running of Standard's European branches. [BNC A2H 229]
- (d) It appears that about 20 IRA members, organised into several units, are operating on mainland Britain and the Continent. [BNC A5R 466]
- (e) It seems that anthropology be used at this time to contribute to the debate on policing, for since the 1964 Police Act and the preceding Royal Commission which was generated through concern over police practice, the organization has held an increasingly central place in the public imagination. [BNC A0K 127]
- (v) sentences with predicative adjectives, preceded by *too*, and followed by the infinitive, as in (6):
- (6) However, although it is too soon to assess the overall pedagogical value and cost-effectiveness of the secondary programme, some difficulties have emerged. [BNC B12 343]
- (vi) sentences with a predicative noun expressing time and an infinitive as a definition, e.g., (7):

- (7) It is time to broaden the focus and look at one of the fundamental, longer-term challenges facing society: the ageing of the population. [BNC AJL 100]
- (vii) sentences expressing certain states, moods, or emotions, with a predicate with its nominal part expressed by a noun, and followed by a clause, as in (8). These sentences can be compared to the sentences of the first or second type, with the difference that they do not express the state of the environment in general, but rather that of a person or group of people.
- (8) It was no particular shock when I found out. [BNC A00 319]

Their frequency in the corpus is not high, as can be seen in Table 1. In some disciplines (H, LC, S) their frequency per 1,000 words is the same (0.2), but per article it can be slightly different (1.8 and 1.4). This fact suggests that the frequency, albeit slightly, also depends on the author. But this difference, again, is very small, and sometimes there is none, and it depends rather on the subject than on the author's style. Quantitative analysis of each type of impersonal sentence has not been performed, since it was evident during the research that most subtypes of this category are not frequent in the texts under analysis, which is understandable for scientific texts in the humanities. The impersonal sentences proper, though, are taken into account to distinguish them from other types of sentences with the impersonal element *it*; it is also possible that they are used for a particular communicative purpose too, namely of the fourth type, to express modality.

| Discipline                | Number of words in the texts under analysis | Raw number | Per 1,000 words | Per text   |
|---------------------------|---|------------|-----------------|------------|
| <b>History</b>            | 110,800                                     | 20         | 0.2             | 1.8        |
| <b>Linguistics</b>        | 115,000                                     | 17         | 0.1             | 1.7        |
| <b>Literary Criticism</b> | 110,000                                     | 17         | 0.2             | 1.4        |
| <b>Art Criticism</b>      | 114,000                                     | 7          | 0.06            | 0.6        |
| <b>Political Science</b>  | 136,800                                     | 13         | 0.1             | 1.2        |
| <b>Sociology</b>          | 104,000                                     | 24         | 0.2             | 1.4        |
| <b>Philosophy</b>         | 107,000                                     | 30         | 0.3             | 2.7        |
| <b>Total</b>              | <i>797,600</i>                              | <i>128</i> | <i>0.2</i>      | <i>1.5</i> |

**Table 1.** Frequency of impersonal sentences proper.

## 4.2 Constructions with Introductory *It*

In this section we will deal with simple and complex sentences in which *it* is a formal subject, often called *anticipatory/introductory it*, since its meaning is more or less connected with the rest of the sentence (or another clause), for which it serves as a kind of introduction. Because of the lack of space we are not going to deal with the syntactic status of *it* in this paper, and we will center on its frequency, the typology of the constructions it appears in, and then on pragmatics.

- (i) Simple sentences with a compound nominal predicate and a non-finite verb: It+Vlin+A/N +Vinf/Ving.
- (9) It is worth quoting their terms of reference in full. [BNC B28 347]
- (ii) Complex sentences with a predicate of the same type, where *it* refers to a clause: (S(S<sub>1</sub>(NP/su)<sub>(vp</sub> Vlin+A/N(+Vinf)))(S<sub>2</sub>(Su)(VP))).
- (10) It was important that members of the Party should not come out with calls for a referendum on capital punishment, as some candidates were reported to have done. [BNC EEC 1554]
- (iii) Complex sentences with a simple verbal predicate in the Passive Voice: It+Vp+subordinate clause.
- (11) It is thought that a deliberate refusal to put a victim's mind at rest when the accused has unwittingly frightened him is an assault. [BNC HXE 2005]
- (iv) Complex sentences with a compound modal verbal predicate: It+Vmod+Vinf.
- (12) But it must be recognized at the outset that as soon as sampling is carried out the statements made about the cases involved become probability statements. [BNC B25 979]
- (v) Sentences with predicative complexes, where *it* is either a grammatical subject: It+Vlin+Adj/N+for-to-infinitive complex, as in (13a), or an object: (S(NP/Su) (V-it/od . . .)), as in (13b).
- (13) (a) It is natural for the speaker to place in initial position an element which relates what s/he is about to say to what has been said before. [BNC FRL 639]
- (b) Finally, we have thought it worthwhile to reprint, yet again, Basil Bernstein's classic, 'Education Cannot Compensate for Society'. [BNC CLW 617]

Their frequency can be seen in Table 2.

| Type of the construction  | Discipline |             |             |             |             |             |             |
|---|------------|-------------|-------------|-------------|-------------|-------------|-------------|
|   | H          | L           | LC          | AC          | P           | S           | Ph          |
| <i>It</i> +Vlin+A/N +Vinf/Ving<br>(S(NP/Su)(V-it/od...))                                | 0.2<br>0.1 | 0.4<br>0.09 | 0.1<br>0.07 | 0.1<br>0.07 | 0.2<br>0.14 | 0.2<br>0.09 | 0.4<br>0.06 |
| <i>It</i> +Vlin+Adj/N+for-to-<br>infinitive complex                                     | 0.03       | 0.04        | 0.06        | 0.09        | 0.05        | 0.04        | 0.1         |
| <i>It</i> + Vp+subordinate clause   | 0.06       | 0.17        | 0.11        | 0.1         | 0.02        | 0.04        | 0.11        |
| <i>It</i> +Vmod+Vinf /Vlin+A (/N)   | 0.04       | 0.11        | 0.03        | 0.09        | 0.04        | 0.12        | 0.27        |
| (S(S <sub>1</sub> (NP/su) <sub>VP</sub> Vlin+<br>+A/N(+Vinf)))(S <sub>2</sub> (Su)(VP)) | 0.6        | 0.4         | 0.3         | 0.5         | 0.5         | 0.4         | 1.2         |

**Table 2.** Various constructions with introductory *it* by discipline (per 1,000 words)

### 4.3 Clefts

Another type of construction with the desemanticized element *it* is *It* + be + NP + relative clause (cleft). The construction “*it is . . . that (who, which)*” can move the focus to any part of the sentence except for a predicate. Complex sentences with clefts resemble complex sentences with relative clauses, but there are some structural differences between them. Relative clauses usually refer to the main constituent in the main clause, which is not necessarily the case with clefts, where the subordinate clause may refer to other constituents as well. Additionally, *that/who/which* can be omitted in a relative clause, while in complex sentences with clefts they are necessary (other cases are rather exceptions) (Wekker and Haegeman 1996, 150–51). So, different constituents can be emphasized with the help of such constructions: for example, a subject, as in (14a), an object, as in (14b), or an adverbial modifier, as in (14c). In this way, some part of the sentence (and, accordingly, some portion of the information) becomes salient (Cruse 2000, 58). The frequency of their appearance in different disciplines can be seen in Table 3 below.

- (14) (a) In the 1950s and 1960s the royal castles were examined in detail by various authorities, but it was the great baronial buildings in Wales that attracted King. [BNC A29 95]
- (b) It was to this common-sense knowledge that Berger and Luckmann directed the sociology of knowledge. [BNC CGY 288]

- (c) But it was in the USA that sociology was emerging as a separate discipline both academically and institutionally. [BNC CGY 123]

| Focal element                 | H    | L   | LC   | AC  | P    | S    | Ph   | Total |
|-------------------------------|------|-----|------|-----|------|------|------|-------|
| <b>Subject</b>                | 44.7 | 61  | 29.6 | 48  | 61   | 47.4 | 55   | 48    |
| <b>Direct object</b>          | 2.6  | 7.7 | 0    | 7.4 | 0    | 10.5 | 15   | 6.9   |
| <b>Indirect object</b>        | 2.6  | 0   | 3.7  | 1.9 | 0    | 5.3  | 0    | 2     |
| Adverbial modifier of         |      |     |      |     |      |      |      |       |
| <b>place</b>                  | 7.9  | 7.7 | 18.5 | 22  | 7.7  | 15.8 | 22.5 | 16.7  |
| <b>time</b>                   | 28.9 | 0   | 25.9 | 5.6 | 15.4 | 10.5 | 0    | 12.3  |
| <b>manner</b>                 | 2.6  | 23  | 7.4  | 13  | 7.7  | 5.3  | 5    | 8.3   |
| <b>condition</b>              | 2.6  | 0   | 0    | 1.9 | 0    | 0    | 0    | 0.5   |
| <b>purpose</b>                | 2.6  | 0   | 7.4  | 0   | 0    | 5.3  | 2.5  | 2.9   |
| <b>attended circumstances</b> | 5.3  | 0   | 7.4  | 0   | 7.7  | 0    | 0    | 2.5   |

**Table 3.** Frequency of various parts of the sentence in the focal position in clefts (in %).

#### 4.4 Types and Disciplines Compared

As we can see, there are various constructions with the desemanticized element *it* used in scholarly texts in the humanities. Their total frequency is 1.5 per 1,000 words. But their frequency varies from discipline to discipline, which can be seen in Tables 1–4, but which we do not describe in great detail here because of the lack of space. It is not only the frequency of impersonal constructions in general that varies, but also the rate of this or that structural subtype within one discipline. All the disciplines are similar in the fact that constructions with introductory *it* are the most frequent, the second most frequent constructions are clefts, and the least frequent are impersonal constructions proper; however, in the texts in the areas of political science, sociology, linguistics, and literary criticism the rate of the last two is the same. Generally speaking, the highest frequency of impersonal constructions is observed in philosophical texts, the lowest in literary criticism. Perhaps it is due to the peculiarities of the disciplines and their subjects of study: for philosophy it is more probable to study situations characterized by impersonality, and subjective evaluation is undesirable (this can be partly hidden with the help of impersonal constructions), while literary criticism is to some extent predetermined to be in some sense subjective, and there is less need to search for impersonal formulations. But this question requires further research with special attention to context, from the pragmatic point of view, which is only outlined in this paper (in the section below).

|                    | Impersonal Proper | Introductory <i>it</i> | Clefts |
|--------------------|-------------------|------------------------|--------|
| History            | 0.2               | 1.1                    | 0.3    |
| Linguistics        | 0.1               | 1.2                    | 0.1    |
| Literary Criticism | 0.2               | 0.7                    | 0.2    |
| Art Criticism      | 0.06              | 1                      | 0.5    |
| Political Science  | 0.1               | 1                      | 0.1    |
| Sociology          | 0.2               | 0.9                    | 0.2    |
| Philosophy         | 0.3               | 2.1                    | 0.4    |

**Table 4.** Frequency of various constructions with the impersonal element *it* (per 1,000 words).

## 5. Remarks on the Issues of Pragmatics of Impersonal *It*-Constructions

There are two approaches to the syntax-pragmatics interface. One is syntax-centered, i.e., it attributes to pragmatics a secondary role in the linguistics system. The other is pragmatics-centered. But now a third one is being formed—syntactic-pragmatic, which defines the connections of different depths on different levels between syntax and pragmatics (Fukushima 2009, 1055). Attempts to integrate syntax and pragmatics were made by Ross (1970) and Gordon and Lakoff (1971). Ross formulated a hypothesis that there is another level in the declarative sentence projected by the syntactic structure, with a verb, which phonetically is not expressed, and which takes a zero subject (speaker) and object (addressee) (Ross 1970, 223). With this hypothesis he tried to present the pragmatic aspect of a sentence through its syntactic elements. But this performative theory has the following drawback; it seems impossible to distinguish between the sentences *John laughed* (possible fact) and *I claim that John laughed* (true fact, if uttered) in terms of truth-conditions of propositions (Fukushima 2009, 1056).

One of the points of the syntax-pragmatics interface is the correspondence or connection between the Topic-Comment and Subject-Predicate pairs. Topic and Comment have to do with utterances, Subject and Predicate with sentences. The utterance is defined by the communicative goal and the illocutionary force. Such a component does not appear in the syntactic structure of a sentence. So, the utterance *John loves the sea* can be expanded in the following way: *as for John, I am telling you that John loves the sea*. As we can see, there is a declarative statement *I am telling* in the pragmatic representation which has nothing to do either with the meaning of the propositional predicate “love” or with its relation to the arguments “John” and “sea.” So, *I am telling* must be a higher-level predicate. A higher-level predicate is a modus of the utterance (Sornicola 2009, 1091). Thus, the utterance *John is coming* can be analyzed in two ways, depending on what is in focus. In the first case, the whole statement is in focus

(pragmatic presupposition can be expressed by the question “what is going on?” “what is happening?”), while in the second case John is in focus (there is a presupposition that someone is to come). In other words, it can be put as in (15). According to (15a), there is no Topic-Comment pair in the utterance; according to (15b), the Topic is “to come.”

(15) (a) (as for what is happening) I’m saying that what is happening is that John is coming).

(b) (as for who is coming) I’m saying that the person who is coming is John.  
(Sornicola 2009, 1092)

Returning to impersonal constructions, they seem to build a bridge between pragmatic and syntactic structures. In cases of impersonal sentences proper or those with an introductory *it*, the *it*-construction functions as an explicated higher-level predicate, and in the case of clefts, it switches the roles of parts of the sentence (utterance) in terms of Topic-Comment relations. Impersonal constructions as a higher-level predicate not only add to the illocutionary force, but also function as a means of hedging, as plausibility shields in particular (Fraser 2010, 19–32) and affect the truth conditions of propositions (e.g., in sentences such as *It is thought/it is possible that p*, where *p* stands for proposition). This is also a kind of evaluation the author makes about his/her statement, which can be either modal, as it was, for example, in (5e), or axiological, as in (10).

*It*-constructions also serve the realization of the Cooperative Principle. The Maxim of Quality tells us 1) not to say what we do not believe to be true, and 2) not to say what we do not have enough evidence for (Lindblom 2009, 152). So, with the help of modality we can express our thoughts, even if we do not have enough evidence so far to hold them as being true, without lying. According to the Maxim of Quantity we should not give more information than necessary (Lindblom 2009, 152). Impersonal constructions allow us to avoid references to the source of the modal evaluation, which contextually may be unnecessary and would overload the discourse. Kiefer suggests the following Conversational Postulate in relation to modality: “Express ATT (attitude) (modal) that indicates the strongest commitment for which you have evidence” (Kiefer 1984, 77).

Impersonal constructions also help the author to present a variety of points of view on one and the same question or to formulate questions as problematic (heteroglossia), since they “modalize,” or evaluate statements, helping the author to place them within discourse, particularly when some points of view do not coincide with those of the author, are problematic in terms of truth conditions, or need further consideration, as in the italicized phrases in (16).

(16) More recently, however, *it has been suggested* that in the second tetralogy Antiphon has the distinction between causal and moral responsibility in full view. *I maintain, pace Barnes*, that Antiphon was capable of making the distinction, *but*

*I accept also that Antiphon's defense fails to make the argument Barnes thinks he should have. [Mann 2012, 8]; It is then apparently concluded that since affirming the existence of things in themselves—whether as the bearers of intrinsic properties (Langton) or the sources of sensory affection (Westphal)—does not involve the determinacy of empirical cognition or knowledge of intrinsic properties, it is permitted within use of the unschematized categories. However, I am not quite convinced that this conclusion follows, for the ‘indeterminacy’ at issue here seems equivocal, and neglect of the category of existence may be to blame [McWherter 2012, 57].*

## 6. Conclusions

In this paper we have examined *it*-constructions in texts in the humanities. Such constructions were carefully separated from any others of a similar type and then classified according to their structure; their frequency was calculated, and then they were analyzed in terms of their pragmatic functioning. On the basis of the analysis that was conducted we can say that such structures are quite frequent in scholarly texts, and the most frequent are those with an introductory *it* in the role of a formal subject. On the pragmatic level these structures perform various functions. They serve as a device in the process of hedging and affect the truth conditions of propositions, which is of special importance in academic discourse. They express and foreground evaluation, either modal or axiological, and, being impersonal, they help to abolish the subject of the evaluation and create an impression of objectivity. Additionally, they affect the information structure and contribute to dialogism and to the fulfillment of the Cooperative Principle. With regard to another type, clefts, their pragmatic functioning is related to the information structure only. Sentences with an impersonal verb as a predicate either have nothing to do with pragmatics, or function in the same way as those with an introductory *it*, depending on the subtype. The evaluation in impersonal sentences and the peculiarities of their information structure unfold new perspectives for further study.

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## Corpus

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# Explicitation and Implication in Revised Translations

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**Abstract:** The aim of the present study was to find out whether revisers perform shifts resulting from explicitation and implication while working on translated texts. Some of the studies dedicated to the issue of explicitation and implication have shown that these phenomena are connected to translation competence and may not always be desirable (e.g., Levý 1965; Klaudy 2003; Englund Dimitrova 2005). Therefore, it seems logical that revisers whose aim is to improve the quality of translated texts adjust these “anomalies” and modify the optional transfer operations of the translators, at the same time performing explicitation and implication themselves. During the empirical analysis excerpts from draft Hungarian translations of five contemporary English novels were compared to their revised Hungarian versions—mainly on the basis of Klaudy’s (2003) categorization of transfer operations. The results of the study seem to indicate that revisers do perform explicitation and implication, modifying the translators’ operations and performing them independently, which points to the conclusion that the phenomenon, so far considered as a translation universal, may indeed be part of the editorial process, which is present in both translation and revision.

**Keywords:** explicitation; implication; optimalization; revised translation; universals.

## 1. Introduction

Explicitation has enjoyed considerable attention within descriptive translation research in the quest to identify possible universals of translation. The results supported by empirical studies have indeed provided support for explicitation as an inherent feature of translated texts (Laviosa 2009). However, research testing Blum-Kulka’s (1986) famous explicitation hypothesis does not normally take into account the fact that most of the time the corpora that are examined contain revised translations. These texts are not simply results

of the translator's transfer operations, but were affected by the reviser's modifications as well. Therefore, the question arises whether the explicating operations and the resulting shifts attributed to the translator are universal features of translation, or may belong to the editorial process, which is present in both translation and revision (Mossop 2001).

The main aim of the present study was to form hypotheses which can serve as a basis for further research on the relation of draft and revised translations. Particular emphasis was put on the examination of explicating—and implicating—shifts, as a universal phenomenon of translation. The results of our pilot study (Robin 2010) show that revisers are not only concerned about grammatical and spelling mistakes but also edit the translated texts, modifying their grammatical and lexical redundancy and their level of explicitness. However, it is yet to be discovered how much revision actually affects the make-up of the translated text or the explicating and implicating transfer operations of the translators.

## **2. Explicitation and Implication in Translation**

The concept of explicitation and implication was first introduced to translation theory by Vinay and Darbelnet ([1958] 1995, 342–44). These textual phenomena were then characterized as sentence-level stylistic techniques resulting from general translational operations, following the norms of the target language. They define explicitation as “the process of introducing information into the target language which is present only implicitly in the source language but which can be derived from the context” (Vinay and Darbelnet [1958] 1995, 342). Implication, on the other hand, is “the process of allowing the target language situation or context to define certain details which were explicit in the source language” (Vinay and Darbelnet [1958] 1995, 344). Later studies and empirical research have aimed to shed more light on the significant characteristics of explicating and implicating shifts in translated texts, broadening the domain of the two opposing phenomena.

### **2.1 The Explicitation and Asymmetry Hypotheses**

Although the concept of explicitation had long been familiar to translation scholars, the first systematic study of this textual feature was conducted by Blum-Kulka (1986). After examining shifts in cohesion and their effects on coherence, the impact of explicitation on translations at text level, she postulated her now well-known hypothesis:

The process of interpretation performed by the translator on the source text might lead to a TL text which is more redundant than the SL text. This redundancy can be expressed by a rise in the level of cohesive explicitness in the TL text. This argument may be stated as *the explicitation hypothesis*, which postulates an observed cohesive explicitness from SL to TL texts regardless of the increase traceable to differences between the two linguistic and textual systems involved. It follows that explicitation is viewed here as inherent in the process of translation. (Blum-Kulka 1986, 19)

The above statement has since inspired a lot of empirical research on explicitation within translation studies, and as a result explicitation has generally been considered a universal feature of all types of translated texts.

While examining explicating and implicating transfer operations, Klaudy (2009) came to the conclusion that in the case of non-obligatory explicitation regular asymmetry can be observed; explicitation in one language direction is not matched by implicitation in the other direction. Therefore, Klaudy proposes to complement Blum-Kulka's (1986) hypothesis by arguing that translators, when given the choice, do not opt for implicitation, but prefer explicitation where they see an opportunity, the result of which is a rise in the explicitness of the translated text.

## 2.2 The Typology of Explicitation

Klaudy (2001; 2004) set up a typology for explicitation and implicitation that expanded the original understanding of the two operations. She not only defined them as translational techniques used on the basis of conscious decisions on the part of the translator, but also took into account the differences between the two languages involved in the translation as well. Klaudy differentiates between phenomena which are language-specific and those which are not. Therefore, in her typology she characterizes four different types of explicating transfer operations, as shown below (Klaudy 2001, 290):

- **obligatory:** motivated by differences in the syntactic and semantic rules of the two languages; without them target language sentences would be ungrammatical; the translator does not have a choice; they must perform the operations (e.g., Hun → Eng: inserting personal pronouns into the sentences)
- **optional:** motivated by differences in text-building strategies and stylistic preferences between languages; without them the target language text might seem unnatural, but the translator nevertheless has a choice of whether to perform the operations or not (e.g., Hun → Eng: using non-finite present participle forms instead of subordinate clauses)
- **pragmatic:** motivated by differences between cultures; without them the members of the target cultures would miss out on certain cultural meanings in the source text; the translator voluntarily inserts the additional information (e.g., Hun ↔ Eng: defining or explaining culture-based phenomena)
- **translation-inherent:** motivated by the nature of the translation process; without them the target text might be difficult to process for the recipients of the target text; the translator voluntarily aims to make the text more comprehensible (e.g., Hun ↔ Eng: adding intensifiers or connectives to create a more comprehensible text)

Language-specific operations involve obligatory and optional explicitation, phenomena which can be explained by the rules and norms of the target language, while pragmatic and translation-inherent operations are performed by the translator in order to produce a target text that is clearer, less ambiguous and easier to process for the reader. The above categories were set up by Klaudy (2004) with regard to explicitation but the same categories also apply to those transfer operations which involve implicitation. She states that explicitation and implicitation are in fact “operational super-categories” (Klaudy 2004, 72) including almost all lexical and grammatical transfer operations (Klaudy 2003).

Englund Dimitrova (2005) differentiates between two types of explicitation: norm-based and strategic transfer operations. Norm-based explicitation is connected to specific language pairs and text types, and is realized when certain types of phenomena occur with such frequency and regularity that they can be considered norms. Strategic explicitation, however, serves as a means to overcome translational difficulties. Strategic explicitation is ad hoc in nature and shows greater diversity than norm-based explicating operations—arising from the translator’s interpretation of the source text. Englund Dimitrova states that her two categories do not contradict those of Klaudy (2001); obligatory and optional operations correspond to the norm-based category, while pragmatic and translation-inherent operations belong to the group of strategic explicitation and implicitation.

### 2.3 A Part of the Editorial Process

In her seminal paper on explicitation, Blum-Kulka (1986, 29) says that in translation the translator becomes the judge of the extent to which they find it necessary to explain the source text’s meaning potential to the target language readers. They aim to amend and even to perfect the text they are working on by applying grammatical and lexical interventions as part of an editing process which seems to be an inherent part of translation (Mossop 2001). Séguinot (1988, 107) states that explicitation arising from the translation process, rather than because of choices accounted for by the language system, in fact results from “editing strategies which appear to be part of the process of comprehending a source text and attending to audience and institutional needs.” Similarly, Englund Dimitrova found that when translators evaluate their solutions negatively, they tend to reformulate the wording in the target language, and do not process the source text again. This reformulation—or editing—of the target text often goes together with strategic explicitation (Englund Dimitrova 2005, 237).

All the above statements were made with regard to explicating transfer operations which are not motivated by the differences between the syntactic and semantic structures of the two languages involved in translation. Thus, it seems that this operational category does not belong to the translation process *per se*, but to the editorial

process that is present both in translation and revision. With the help of explicitation and implicitation the translator edits the meaning potential and grammatical and lexical redundancy of the text to make sure that the message is less ambiguous and more comprehensible for the readers.

The results of our pilot study (Robin 2010) revealed that revisers are not only concerned about mistakes but also *edit* the translations, using voluntary explicitation and implicitation, modifying the grammatical and lexical redundancy of the texts and their level of explicitness. Therefore, it seems problematic to call such operations translation-inherent. We would like to propose an alternative typology for identifying explicitation and implicitation in both translation and revision which reflects the nature of these operations more clearly, mainly building on Klaudy's categories introduced above:

- **rule-based:** obligatory; motivated by the syntactic and semantic rules of languages
- **norm-based:** optional; motivated by text-building strategies and stylistic preferences
- **editorial:** optional; promoting the readability and processability of the text for readers

Klaudy's first operational category was changed from *obligatory* to *rule-based*. Because apart from Klaudy's first category of transfer operations all the other three are optional, it seemed logical to change the name of her second category from *optional* to *norm-based*, as these shifts are motivated by text-building strategies and stylistic *norms*, not rules. Furthermore, we merged Klaudy's last two categories—pragmatic and translation inherent—under *editorial*, as they seem to be motivated by the same intention: to fully explain the meaning potential of the message, and create a readable, comprehensible text for readers by using editing strategies. Translation-inherent universal features might be any of the optional—norm-based or editorial—operations which show a different distribution in editing translated texts than non-translated, original ones.

## 2.4 The Quality Issue

Even before descriptive translation studies set out to discover the generally observable features of translation, Levý (1965, 78–79) identified two phenomena characteristic of translation: “When choosing from among several equivalents or quasi-equivalents for a foreign term, a translator inevitably tends to choose a general term, whose meaning is broader than that of the original one,” talking about implicitating shifts, and “in constructing his sentences, a translator tends to explain the logical relations between ideas even where they are not expressed in the original text,” clearly describing explicitation. He called these phenomena the translator's disease and called attention to the fact that they do not always contribute to quality and are commonly found in mediocre texts. Heltai (2005) also writes that explicitation does not necessarily result in enhanced readability; unreasonable redundancy may even hinder understanding.

In an earlier study Klaudy (1996) found that implicitation or concise wording does not normally characterize inexperienced translators, who are much too afraid of losing important information. Only professional, experienced translators are able to root out unnecessary redundancy in the text. Similarly, Englund Dimitrova (2005) explains that strategic explication—in our categorization: editorial explication—is connected to expertise; it is mainly experienced translators who know how to apply it. Explication and implicitation thus seem to be closely linked with quality. Inexperienced translators—or even professionals—may fall into the trap of the translator’s disease (Levý 1965), and then it is up to the reviser to doctor the translation by using editorial explication and implicitation.

### 3. Research Design

The empirical research focused on the question of whether revisers perform modifications involving explication and implicitation while working on translated texts. As we have discussed above, some of the studies dedicated to these phenomena have shown that they are actually connected to translation competence and may not always be desirable (e.g., Levý 1965; Klaudy 1996; Englund Dimitrova 2005). Furthermore, the results of our pilot study (Robin 2010) revealed that revisers are not only concerned about grammatical and spelling mistakes but also edit the translated texts, modifying their grammatical and lexical redundancy and their level of explicitness. It therefore seems logical to hypothesize that revisers, whose aim is to improve the quality of translated texts, adjust the possible “anomalies” as well, modify the optional transfer operations of the translators, at the same time performing explication and implicitation themselves.

The analyses were performed on a multi-parallel corpus which included the original texts in English, the draft translations and the revised versions. The excerpts from the original texts contained 2,800 words on average. The novels that were examined all belong to young adult fantasy literature—this genre is characterized by fewer terminological or stylistic requirements than professional texts or high literature, giving plenty of room to translators to perform optional transfer operations. The texts that were examined were provided by the publisher of the books with permission to use them for academic purposes. In the discussion of the results they are referred to in the following order:

1. George, Jessica Day. 2009. *Princess of the Midnight Ball*. New York: Bloomsbury.  
George, Jessica Day. 2011. *Éjjéli bál*. Translated by Gertrúd Szakál. Szeged: Könyvmolyképző.
2. Clare, Cassandra. 2007. *City of Bones*. New York: McElderry.  
Clare, Cassandra. 2009. *Csontváros*. Translated by Gergely Kamper. Szeged: Könyvmolyképző.

3. Harris, Joanne. 2008. *Runemarks*. New York: Knopf.  
Harris, Joanne. 2009. *Rúnajelek*. Translated by Katalin Szűr-Szabó. Budapest: Ulpius.
4. Bray, Libba. 2003. *A Great and Terrible Beauty*. New York: Delacorte.  
Bray, Libba. 2008. *Rettentő gyönyörűség*. Translated by Katalin Szűr-Szabó. Szeged: Könyvmolyképző.
5. Cashore, Kristin. 2008. *Graceling*. Orlando: Harcourt.  
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The texts were mainly analyzed on the basis of Klaudy's (2003) categorization of grammatical and lexical transfer operations and the alternative typology of explicitation and implicitation introduced above in Section 2.3. The aim of the text analyses was to determine whether revisers use explicating and implicitating operations while working on translations, and whether they modify the transfer operations of the translators. The analyses were conducted in the following steps:

1. Comparison of draft translation and its source text to identify shifts in translation.
2. Categorization of identified explicating and implicitating operations.
3. Comparison of draft translation with its revised version to identify modifications.
4. Comparison of revised versions to the source texts to identify shifts in revision.
5. Categorization of revisional operations: corrections, norm-based, editorial.
6. Quantification of the changes in explicitness from the source to the revised text.

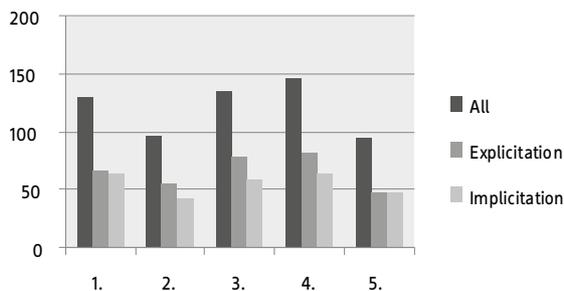
The procedure was applied to the excerpts from all five novels. In the end we compared and interpreted all the data to identify distinct tendencies and draw conclusions.

## 4. Results

Our results are introduced and discussed according to the steps of the analyses. The most important findings are demonstrated in graphs and figures, and illustrated by examples taken from the texts that were examined.

### 4.1 Explicitation and Implicitation in Draft Translations

In the first step of our research we compared the draft translations and their source texts to identify shifts in translation using contrastive text analysis. Our aim was to detect and classify explicitation and implicitation performed by the translators, relying on Klaudy's (2003) typology of lexical and grammatical transfer operations. Figure 1 demonstrates the number of all the operations detectable in each of the excerpts that were examined, as well as how many of these can be categorized as explicitation or implicitation.

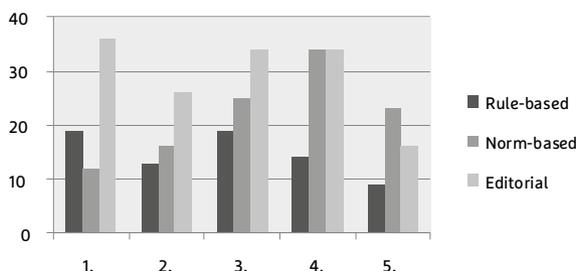


**Figure 1.** Transfer operations in draft translations.

The figure reveals that there are great differences in the number of transfer operations performed by the translators. It is also obvious that the amount of explication exceeds that of implication in all the texts that were examined, supporting Klaudy’s (2009) hypothesis about the strong explicating tendency of translators. However, it is interesting that in the cases of text 1 and text 5 the difference between the amounts of explication and implication is hardly noticeable; in the first excerpt the translator used a remarkably large number of implicating operations, whereas in the case of the fifth text the explicating tendency of the translator proved to be unusually low.

In the following step, we categorized the explicating and implicating operations that had been identified in order to find out whether the large differences in the number of all transfer operations are due to the voluntary use of explication and implication or are the result of language-specific phenomena. The explicating and implicating transfer operations identified in the draft translations were categorized according to the alternative typology in Section 2.3. First, explicating shifts were grouped into one of the three main categories: rule-based, norm-based, and editorial explication.

The results are illustrated in Figure 2. Looking at the data, it becomes quite clear that the number of optional—norm-based and editorial—explicating operations exceeds the number of rule-based explication ones; the latter shows a relatively equal distribution, in opposition to the optional transfer operations which may reflect the individual tendencies of the translators.



**Figure 2.** Explication in draft translations.

In the case of rule-based explicitation, the translators have no choice; they have to enact the required operation, as shown in example (1) below:

- (1) and not waken the **dead** by clattering  
 nem ébresztik fel a **holtakat** is azzal, hogy csattognak  
 not wake<sub>PRESENT.3PL</sub> up the **dead**<sub>ACC.PL</sub> too that<sub>INS</sub> that clatter<sub>PRESENT.3PL</sub>

The insertion of the plural suffix in “holtakat” is an obligatory transfer operation when translating from English to Hungarian; leaving it out would make the whole sentence entirely ungrammatical.

Norm-based explicitation, on the other hand, is optional. Translators have a choice if they want to perform the given transfer operation, which is dictated by language-specific norms and expectations. Most translators execute these operations out of pure routine, as they wish to conform to the expectations of the readers. In our second example, a typical norm-based operation is shown, i.e., raising the English non-finite verb structure to sentence level in the Hungarian text.

- (2) **shielded** by trees or the broad cape of night  
 csak a fák vagy az éjszaka bő köpenye **takart**.  
 only the tree<sub>PL</sub> or the night broad cape<sub>GEN</sub> **cover**<sub>PAST.3SG</sub>

If we look at the data in Figure 2, we can see that the translator of excerpt 4 performed the greatest number of norm-based explicating operations, probably because this text was stylistically and lexically of a higher standard compared to the others.

The number of editorial explicating operations also reveals significant differences between the texts. In the case of editorial explicitation, the translators of excerpts 1 and 4 performed the most operations, the latter more than likely because of the previously mentioned reasons. The translator of excerpt 1, however, seems to have preferred the editorial type of explicitation to norm-based operations. An illustration for editorial explicitation can be seen in example (3) below.

- (3) but his feet stumbled more than they marched  
 lábai azonban már nem masíroztak . . . **Lassan, botladozva haladt**.  
 foot<sub>PL.GEN</sub> however already not march<sub>PAST.3PL</sub> slowly stumbling go<sub>PAST.3SG</sub>

Not only did the translator insert additional words into the text (“already,” “slowly”)—generally considered a case of explicitation (Klaudy 2001)—but they broke up the original sentence into two as well, which is a typical example of editorial explicitation. It seems to be a general tendency that this type of explicitation exceeds the number of operations belonging to the other two categories, rule-based and norm-based. The only

exception is excerpt 5, where instances of editorial explication proved to be the lowest in number, resulting in the unusually small amount of explication in general.

The analysis of the implicating tendencies of the translators has revealed that—as we can see from the data in Figure 1—the largest number of implicating operations was performed by the translator of excerpt 4, where the number of rule-based operations is remarkably higher compared to the other texts (see Figure 3). We may assume that because of the text’s more literary style there were—amongst other things—a higher number of prepositional phrases in the original. In this case translators do not have a choice: they have to perform obligatory implicating operations, using suffixes instead of prepositions, to be able to transfer the meaning into Hungarian, as we can see in the fourth example below:

- (4) **by the light** of the fire  
 a tábortüzem **fényénél**  
 the campfire<sub>GEN</sub> **fire**<sub>GEN.ABL</sub>

Furthermore, Figure 3 tells us that the translators’ tendency to use optional norm-based implication seems to be fairly even: there are no great differences observable in the data. These operations can be traced back to language-specific norms, as in the case of leaving out the personal pronoun when translating from English to Hungarian (see our fifth example); in the latter language personal pronouns are only used when they receive particular emphasis in the text.

- (5) he was not quite nineteen years old  
 még tizenkilenc éves sem volt  
 yet nineteen year old not be<sub>PAST.2SG</sub>

Editorial implicating operations, however, show greater diversity. The number of examples of this particular type of implicating operation is outstandingly high in the first excerpt, and remarkably low in the case of the second, as we can see in Figure 3 below.

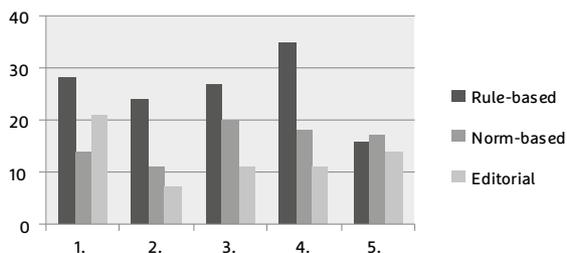


Figure 3. Implication in draft translations.

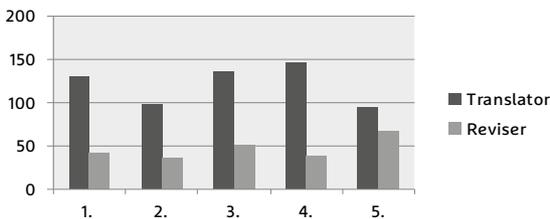
Editorial implicitation cannot be explained by language specific rules and norms. Their primary aim is to reduce the grammatical and lexical redundancy of the target text.

- (6) He laughed a little to himself.  
 Halkan felnevetett.  
 quietly laugh<sub>PAST.3SG</sub>

From the above results we can conclude that the implicating operations in text 1 and 2 reveal opposing tendencies: in the first case the translator performed a remarkably high number of optional implicitation operations, in the latter case an outstandingly low one.

## 4.2 Explicitation and Implicitation in Revised Texts

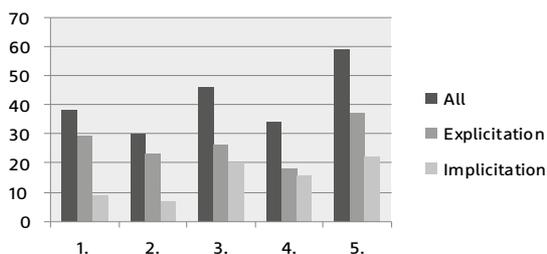
After the categorization of the explicating and implicating transfer operations of the translators, we examined the interventions performed by the revisers, using Klaudy's (2003) typology. First, we identified all the operations performed by the revisers, and compared the data to the number of transfer operations in the draft texts. The results of the comparison are shown in Figure 4 below:



**Figure 4.** Transfer operations and revisional interventions in the corpus.

It is quite obvious that the translators performed a greater number of operations than the revisers. This difference is not only due to the obligatory shifts identifiable in the texts; the translators used more optional explicitation and implicitation as well. We can conclude, though, that where the translators performed fewer operations, the revisers performed more, and vice versa. Therefore, the number of revisional interventions seems to be dependent on the number of transfer operations performed by the translators.

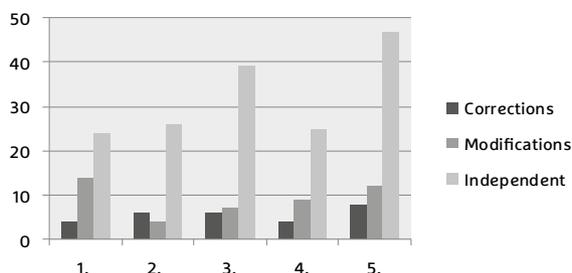
Curiously, the reviser of excerpt 1 used a relatively high number of interventions, though the number of transfer operations was also quite high. The explanation for this phenomenon lies in the outstandingly great amount of implicitation performed by the translator, which was then compensated for by explicitation on the part of the reviser, as is shown in the columns of Figure 5, which illustrates all the explicating and implicating operations performed by the revisers.



**Figure 5.** Explicitation and impication in the revised texts.

It is obvious that the revisers used the highest number of explicating operations where the translator performed an outstandingly great amount of impication (text 1) or small amount of explicitation (text 5). Additionally, the reviser performed more impication where the translator performed very little (text 5), and performed less where the translator used a lot of impication (text 1). In the case of excerpt 2 the reviser performed a lot more explicitation than impication—of which this translator used the lowest amount. The explanation for this phenomenon might be that the translator completed relatively few explicating operations here. Finally, we can conclude that the number of explicating interventions in the revised texts exceeds that of impicating interventions in all the texts that were analyzed.

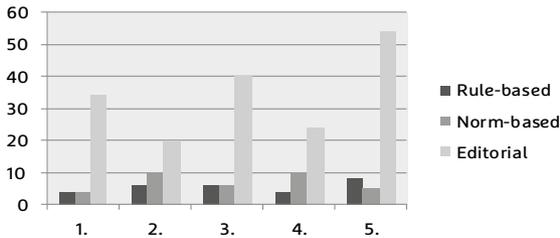
In the next step, we examined whether the revisers modified the transfer operations of the translators or performed independent explicitation and impication during the revision process. We found that apart from making obvious obligatory corrections the revisers modified the transfer operations of the translators, but only to a small extent. The results of the examination are illustrated in Figure 6.



**Figure 6.** Revisional interventions.

Obligatory revisional operation is the correction of mistranslations and grammatical, lexical, stylistic and spelling mistakes. Without these interventions the revised text would not be acceptable according to the rules of the target language. The largest number of corrections was performed in text 5. However, further analysis revealed that the

revisers mainly use independent optional explicitation and implicitation to edit the text. Figure 7 shows us the categories of the identified explicating and implicating operations in the revised texts.



**Figure 7.** Categories of explicitation and implicitation in the revised texts.

As we can see from the above data, the reviser rarely modifies—through a process akin to back-translation—the explicating and implicating transfer operations of the translators. It is clear that such modifications were employed by the reviser of text 1, where they compensated for the unusually high number of implicating shifts performed by the translator:

(7) Westfalín defeated . . . **but it was a grim victory.**

DRAFT

Vesztfália . . . **ádáz csatában legyőzte . . .**

Vesztfália grim battle<sub>ABL</sub> overcome<sub>PAST.3SG</sub>

REVISED

Vesztfálin győzelmet aratott . . . **Vészterhes volt azonban a győzelem.**

Vesztfálin victory<sub>ACC</sub> gain<sub>PAST.3SG</sub> horrible be<sub>PAST.3SG</sub> however the victory

The translator tried to shorten the text by using a nominal phrase; the reviser, however, put back the missing information and even explicitated the text further, breaking up the sentence into two and adding more words.

Apart from making up for information which is missing or left out, the revisers often lessened the grammatical redundancy of the text by modifying the translator's norm-based operations, as is shown in our next example:

## (8) as a blade of grass

DRAFT

|        |      |     |                |                            |
|--------|------|-----|----------------|----------------------------|
| mintha | csak | egy | fűszál         | let volna                  |
| as if  | only | a   | blade of grass | be <sub>PAST.CON.3SG</sub> |

REVISED

|      |     |                |  |
|------|-----|----------------|--|
| mint | egy | fűszál         |  |
| as   | a   | blade of grass |  |

Revisers perform editorial operations with the purpose of optimizing the lexical and grammatical redundancy, creating a balanced text and enriching the vocabulary. These operations do not serve to modify the transfer operations of translators, but aim to work further on the readability and comprehensibility of the text, conforming to the expectations of readers. Examples of the most frequently applied operations are shown below:

## (9) It was growing colder when I left the woods.

DRAFT

|         |                     |                            |        |                           |     |                     |
|---------|---------------------|----------------------------|--------|---------------------------|-----|---------------------|
| Egyre   | hidegebb            | <b>lett</b> ,              | amikor | elhagytam                 | az  | erdőt.              |
| growing | cold <sub>COM</sub> | become <sub>PAST.3SG</sub> | when   | leave <sub>PAST.1SG</sub> | the | wood <sub>ACC</sub> |

REVISED

|        |                           |     |                     |         |                         |                          |     |         |
|--------|---------------------------|-----|---------------------|---------|-------------------------|--------------------------|-----|---------|
| Miután | elhagytam                 | az  | erdőt,              | egyre   | hidegebbre              | <b>fordult</b>           | az  | idő.    |
| after  | leave <sub>PAST.1SG</sub> | the | wood <sub>ACC</sub> | growing | cold <sub>COM.ABL</sub> | turn <sub>PAST.3SG</sub> | the | weather |

The reviser changed the order of the clauses within the sentence, and used richer lexis to express the meaning of the text. In the next example, the reviser again used more explicit wording to emphasize the message in the original source text.

(10) That was Maddy's **fault**, of course.

DRAFT

|       |               |       |                      |                        |
|-------|---------------|-------|----------------------|------------------------|
| Ami   | természetesen | Maddy | <b>hibája</b>        | volt.                  |
| which | naturally     | Maddy | fault <sub>POS</sub> | be <sub>PAST.3SG</sub> |

REVISED

|       |               |       |                    |                        |
|-------|---------------|-------|--------------------|------------------------|
| Ami   | természetesen | Maddy | <b>bűne</b>        | volt.                  |
| which | naturally     | Maddy | sin <sub>POS</sub> | be <sub>PAST.3SG</sub> |

As we can see in Figure 7, revisers make use of this particular type of explicating and implicitating operation while working on their texts. The number of editorial operations depends heavily on the explicating and implicitating tendency of the translators.

## 5. Conclusions

The aim of the present study was to find out whether revisers perform explicitation and implicitation while working on translated texts. The results of the contrastive analysis of source texts, draft translations and their revised versions support our initial hypothesis. The analyses seem to show that revisers do perform explicitation and implicitation, modifying the transfer operations of the translators and performing them independently. We also found that the number of independent explicating and implicating interventions performed to edit the translation exceeds that of the modifications of transfer operations, pointing to the conclusion that the phenomenon so far considered as a translation universal may be part of the editorial process present in translation, as well as in revision. The independent interventions and modifications of the revisers, however, are performed to an extent that depends on the number of transfer operations performed by the translators and the level of explicitness in the translated text. As a result of the revision process, the level of explicitness increased in all of the texts that were examined; the differences between them decreased or leveled out, and therefore it seems probable that revisers—consciously or unconsciously—aim for an optimal level of redundancy, an optimal balance in their texts, while producing richer vocabulary. Further research is necessary, however, to support the hypotheses on the optimizing tendency of revisers and on the level of explicitness in translated and revised texts.

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# A 3D Taxonomy of Word Classes at Work

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**Abstract:** The standard sets of 8–10 word classes (POS) are defined by a mix of morphological, syntactic, and semantic criteria. For some POS the three criteria yield the same result, but POS such as numerals and pronouns end up as heterogeneous classes. The goal of this contribution is to support the idea of a multidimensional taxonomy of word classes using arguments from the practical domains of corpus and applied linguistics. Annotating corpora with a cross-classifying POS tagset facilitates both corpus queries and their use by application tools. Disparate morphosyntactic annotation of multilingual corpora can be harmonized when the concepts behind language- or theory-specific tagsets are properly located in the 3D space of word classes. Finally, a cross-classification of POS can be applied as a powerful tool for the analysis of texts produced by non-native speakers.

**Keywords:** POS; multidimensional taxonomy; tagset; morphological categories.

## 1. Introduction

Language expressions seem to form natural classes that are obvious and self-evident from a pre-theoretical perspective and often taken for granted. On the other hand, the categorization of observable linguistic units, such as morphemes, words, multiword expressions, phrases, clauses, or sentences, is of critical importance to both theoretical and applied linguistics. Such taxonomies, implied or explicitly defined, are integral parts of theoretical generalizations. Linguistic categories are used in analytical tools of all kinds, such as rules, principles, or patterns, and also in abstract representations of real units of text or speech.

There is often more than one aspect of a single unit to describe and analyze. Highly inflectional languages abound with morphological paradigms that may not quite coincide with the roles of the units in syntax or semantics. A relative pronoun,

defined by its semantic property of referentiality to an antecedent, may have an adjectival declension pattern as its morphological property, but it can be used in its syntactic role in a nominal position, e.g., as a subject. Thus, morphology, syntax, and semantics may take different perspectives, calling for a cross-classification of linguistic units at least along these three dimensions. If syntax is adopted as the core of grammar, the other aspects of classification may be part of the interfaces to semantics, phonology, morphology, etc.

The need for multiple criteria applied in parallel is quite common in linguistics. Syntactic (second position) clitics in Czech belong at the same time to one of the classes of auxiliaries, pronouns, or particles. Function words of all kinds are sometimes (especially in traditional frameworks) viewed as parts of a single unit: analytical (periphrastic) verb form, noun in a “prepositional case,” or inherently reflexive verb, while the rules of syntax need to approach all the individual parts of such units as independent words to make sure they are consistent with any constraints on ordering, agreement or government. At least some types of multi-word units and contractions, phenomena representing the opposite corners of the issue of tokenization, pose a challenge to any approach that defies the distinction between an orthographical, phonological and a syntactic unit.

How should the categories be designed and defined? As is the case with meaning, categories appropriate to a unit are revealed in context, where the unit’s behavior and function is observable. If the categories are based on multiple orthogonal aspects, they should correlate with corresponding aspects of the context. This can be best observed in ambiguous forms. Morphological categories of an agreeing word form such as number and gender are determined by agreement with other forms, case by agreement or government; syntactic category of the form by government (valency); and semantic category by its lexical properties, compatibility with the rest of the utterance, the wider context, and the situation. There may be a simple pattern behind the complex system of categories and their multidimensional properties, but one should start with the observable facts about an expression before a classification is proposed and a generalization reached, like an entomologist who starts from the description of individual species before she attempts to build a morphological or functional taxonomy of all insects and their parts.

In the following, we will be concerned with options for the design of taxonomies of word classes, together with morphological categories as their properties. The primary focus is on Czech, but most points should be relevant also to other morphologically non-trivial languages. After an overview of existing classifications, including proposals for cross-classifying taxonomies, we show the core of a scheme based on a consistently applied three-dimensional classification. The approach is shown to be useful in at least three domains: to represent morphological analysis of Czech in the annotation of a text corpus; to analyze non-standard forms in the language of

non-native learners of Czech; and to harmonize disparate tagsets used in the annotation of a multilingual parallel corpus.

## 2. Word Class Taxonomies

Most taxonomies are based on the system of eight parts of speech for Ancient Greek, attributed to Dionysius Thrax (2nd century BC): (i) *noun* inflects for case, signifying an entity; (ii) *verb* inflects for tense, person, and number, signifying an activity or process; (iii) *participle* shares the features of the verb and the noun; (iv) *article* inflects for case and attaches to nouns; (v) *pronoun* is marked for person and substitutes a noun; (vi) *preposition* does not inflect and is placed before other words; (vii) *adverb* does not inflect and modifies a verb; and (viii) *conjunction* does not inflect and binds discourse units. Later (due to Apollonius Dyscolus, 1st AD, and Priscian, 6th AD) *article* was replaced by *interjection*—Latin has no articles—and *participle* by *adjective*.

Other languages seem to require additional classes, such as *determiners*, *particles*, *numerals*, or *classifiers*, a more detailed subdivision of some classes (three types of adjectives in Japanese, or *predicatives* and *modal adverbs* as subclasses of adverbials in Czech<sup>1</sup>), or no distinction between some established classes. Moreover, additional criteria, such as communicative function, may come into play, while other criteria, otherwise taken for granted, may not be sufficiently justified.<sup>2</sup>

It is difficult to find taxonomies that are not based on the classical Greek system.<sup>3</sup> For Czech, the addition of numerals and particles rounds off the standard number of word classes for Czech to ten, while the classes may be differentiated as inflected vs. non-inflected, open vs. closed, and autosemantic (content or lexical words) vs. synsemantic (structure or function words).

All such taxonomies are defined by a mix of morphological (also called inflectional), syntactic (functional, distributional) and semantic (content-based, lexical) criteria. At least for Czech and some other morphologically rich languages the three criteria agree for nouns or adjectives. Nouns refer to entities and decline independently in typical nominal positions as subjects, objects, etc.; adjectives represent properties and agree with nouns as attributes or predicative complements. On the other hand, numerals and pronouns are defined solely by semantic criteria, while their syntactic and morphological behavior is rather like that of nouns (cardinals and personal pronouns) or adjectives (ordinals and possessive pronouns). See Table 1 for a more detailed overview.

1 Cf. Kopečný (1958, 142–43), or Uličný and Bláha (2013, 162–69).

2 Cf., e.g., Zádrapa (2011) on Classical Chinese.

3 For an overview, cf., e.g., Baker (2003).

|                      |               | Example                  | Gloss   | Lexical | Inflectional | Syntactic      |
|----------------------|---------------|--------------------------|---------|---------|--------------|----------------|
| Numerals             | Ordinal       | <i>pátý</i>              | fifth   | numeral | adjective    | adjective      |
|                      | Cardinal      | <i>pět</i>               | five    | numeral | noun         | noun           |
| Pronouns             | Personal      | <i>ty</i>                | you     | pronoun | noun         | noun           |
|                      | Possessive    | <i>tvůj</i>              | your    | pronoun | adjective    | adjective      |
|                      | Relative      | <i>který<sup>4</sup></i> | which   | pronoun | adjective    | noun           |
|                      | Interrogative | <i>který<sup>5</sup></i> | which   | pronoun | adjective    | noun/adjective |
| Adverbial participle |               | <i>volající</i>          | calling | verb    | participle   | adverbial      |

**Table 1.** Sample lexical, inflectional, and syntactic categorization.

Thus classes such as numerals or pronouns break down into subclasses. But these subclasses are similar across different standard classes. Komárek et al. (1986) review two solutions: (i) since each criterion is useful for a specific purpose, the criteria can be applied in parallel, resulting in cross-classification (see Section 3 below), or (ii) one of the criteria is adopted as the main one, others as complementary. Indeed, there are taxonomies based on different basic criteria: semantics (e.g., Brøndal 1928), morphology (e.g., Saloni and Świdziński 1985, 95), syntax (e.g., Grzegorzczkova et al. 1998, 59), syntax/morphology (e.g., Komárek et al. 1986, 13–16).

In theoretical linguistics, the syntactic criterion prevails: four basic *lexical categories*, determined by the combinations of two binary features (Chomsky 1981), correspond to labels in a syntactic tree.<sup>6</sup> The syntactic perspective is even more explicit in Jackendoff (1977, 31–32), or Déchaine (1993)—see Table 2. The

4 Relative *který* can only be a syntactic noun, see (i) and (ii).

(i) *Psa, který nemá náhubek, do vlaku nepustí.*  
 dog<sub>ACC</sub> which<sub>NOM</sub> has<sub>NEG</sub> muzzle<sub>ACC</sub> into train let in<sub>NEG,PL,3RD</sub>  
 “An unmuzzled dog won’t be allowed on the train.”

(ii) *Paní, \*které/jejíž pes nemá náhubek, do vlaku nepustí.*  
 lady<sub>NOM</sub> which/whose<sub>ACC</sub> dog<sub>ACC</sub> has<sub>NEG</sub> muzzle<sub>ACC</sub> into train let in<sub>NEG</sub>  
 “A lady whose dog has no muzzle won’t be allowed on the train.”

5 Interrogative *který* can be a syntactic adjective or noun (iii). Incidentally, there is an identical tag for both types of *který* in one of the most common tagsets used for Czech (P4).

(iii) *Kterého (psa) do vlaku nepustí?*  
 which<sub>ACC</sub> (dog<sub>ACC</sub>) into train let in<sub>NEG</sub>  
 “Which dog won’t be allowed on the train?”

6 This is also true about *functional categories*, such as determiners and complementizers, which are in various specifier positions (Emonds 1985). For a detailed proposal, relevant to a language with rich inflection, see Emonds (2000; 2004).

features can be used to specify hyperclasses, representing some natural properties, e.g., members of the class of –nominal categories (verbs and prepositions) assign case. However, none of the feature systems is able to capture classes distinguished by all relevant properties.

|             | Chomsky (1970) |        | Jackendoff (1977) |        | Dechaine (1993) |        |
|-------------|----------------|--------|-------------------|--------|-----------------|--------|
|             | nominal        | verbal | subject           | object | referential     | object |
| Nouns       | +              | –      | +                 | –      | +               | –      |
| Verbs       | –              | +      | +                 | +      | +               | +      |
| Adjectives  | +              | +      | –                 | –      | –               | –      |
| Adpositions | –              | –      | –                 | +      | –               | +      |

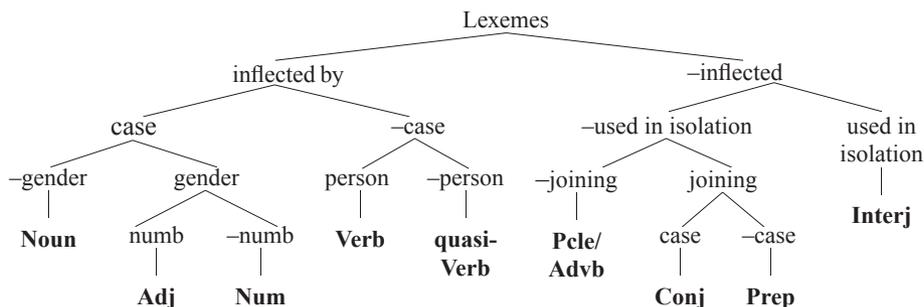
**Table 2.** A syntax-based taxonomy—features determining basic lexical categories.

To handle gerunds and other *mixed (hybrid) categories*, Lapointe (1999) proposes *dual lexical categories*, determining both the external (distributional) and internal syntactic properties of the item. This is reminiscent of categorial grammar (cf., e.g., Steedman and Baldrige 2011), where most categories encode both their (internal) combinatorial and their (external) distributional potential within a complex label. We shall return to this topic below in Section 3.

On the other hand, Saloni and Świdziński (1985, 95) argue that for richly inflected languages the classification should be based on the morphological criterion because in such languages morphological properties determine syntactic functions to a large extent, and propose a morphology-based binary classification for Polish (Figure 1).<sup>7</sup> Note that each non-terminal node of the decision tree relies on the presence or absence of a morphological category, at least in the “inflected by” branch. However, the –inflected branch resorts to syntactic criteria (e.g., “case” in this branch means “requiring case” of some other item). Moreover, the class *Pcle/Advb* may be seen as too coarse-grained for some purposes, calling again for additional criteria.<sup>8</sup>

7 The –case *l-* (or past) participle is treated as a finite form, although it is marked (both in Polish and Czech) for person by an auxiliary (1st and 2nd person) or by its absence (3rd person).

8 Note that the classification makes a specific assumption about word classes. E.g., gradable adverbs are treated as a subclass of adjectives. See Saloni and Świdziński (1985) for details.



**Figure 1.** A morphology-based taxonomy.

The morphology-based taxonomy shows how the classes correlate with appropriate sets of morphological categories. Interestingly, a single item can have more than a single set of such categories, see (1).

- (1) Jana přišla, ale jejího syna jsem neviděl.  
 Jana<sup>FEM</sup><sub>ACC</sub> came but her<sup>FEM,3</sup><sub>MASC,ACC</sub> son<sub>MASC,ACC</sub> I haven't seen  
 “Jana has come, but I haven't seen her son.”

A Czech possessive pronoun has two sets of morphological categories: (i) person, number and gender to agree with its antecedent and (ii) number, gender, case to agree with the modified noun. The former set is shared by personal pronouns with their *referential* categories of person, number, and gender, and the latter set by adjectives with their (NP-internal or subject–nominal predicate) *agreement* categories of number, gender, and case. Possessive pronouns also have relative variants, showing the same pattern (2). The relative possessive pronoun *jejíhož* refers to the antecedent in 3rd person feminine singular but agrees with the modified noun in masculine singular. The form shows all these categories.

- (2) Paní, jejíhož psa nepustili do vlaku, je moc smutná.  
 lady<sup>FEM</sup> whose<sup>FEM</sup><sub>MASC,ACC</sub> dog<sub>MASC,ACC</sub> let in<sub>NEG</sub> into train is very sad  
 “The lady whose dog wasn't allowed on the train is very sad.”

These two sets of morphological categories, which are appropriate to Czech possessive pronouns, can be seen as properties of distinct aspects of their classification. The referential properties are appropriate to the lexical class of pronouns; the agreement properties to the inflectional class of adjectives. Czech possessive pronouns belong to both classes at the same time. Similar examples can be found in other word (sub)classes, such as numerals or deverbatives, where the categories of

aspect, polarity and cardinality co-occur with the lexical word class, while agreement-related categories of person, number and gender co-occur with the inflectional word class.

These facts, together with the difficulty of designing a taxonomy based on a single or “main” criterion, point in the direction of a parallel, cross-classifying taxonomy.<sup>9</sup>

### 3. Word Classes in 3D

The cross-classification approach has been proposed before, e.g., by Brøndal (1928) and Komárek (1999). However, it is rarely encountered in standard reference books. A notable exception is found in Komárek et al. (1986, 13–16), who propose a classification with a *meaning base*, consisting of four basic (standard, lexical) word classes S, A, V, C (C for “circumstant”), combined with their syntactic correlates, *functional features*: s, a, v, c. See Table 3 for examples.

|    |                                  |  |
|----|----------------------------------|--|
| Ss | <i>kos zpívá</i>                 | “a <b>blackbird</b> is singing”        |
| Sa | <i>hlas kosa</i>                 | “the voice of a <b>blackbird</b> ”     |
| Sv | <i>to je kos</i>                 | “this is a <b>blackbird</b> ”          |
| Sc | <i>přiletěl s kosem</i>          | “he flew in with a <b>blackbird</b> ”  |
| Vs | <i>pracovat neznamená řečnit</i> | “to <b>work</b> does not mean to talk” |
| Va | <i>pracující muž</i>             | “a <b>working</b> man”                 |
| Vv | <i>dělníci pracují</i>           | “workers are <b>working</b> ”          |
| Vc | <i>onemocněla těžce pracujíc</i> | “she became ill <b>working</b> hard”   |

**Table 3.** Sample classification using *meaning base* and *functional features*.

Parallel classification of linguistic units is also used in some formal linguistic theories. In Head-Driven Phrase Structure Grammar (Pollard and Sag 1994), the typed feature structure called *sign*, representing words and phrases, has separate parts identifying the unit’s morphological, syntactic and semantic properties. A single *sign* may be used to handle various phenomena at the same time. Such phenomena often require a parallel approach to multiple levels of linguistic abstraction,<sup>10</sup> and the individual properties may be used as interfaces to external theories or processing modules.

More recently, parallel classification has found several practical applications related to the analysis and annotation of linguistic corpora. In the following, we look

9 Such taxonomy does not entail that word classes across dimensions are necessarily identical. See Section 3 below for a discussion about the repertory of word classes in different dimensions.

10 E.g., polite forms, cf. Rosen (2007).

at its use (i) in learner corpora, where it helps to identify and analyze domains of non-standard language use in texts and speech produced by non-native learners, and (ii) in a multilingual parallel corpus, where it helps to harmonize language-specific morpho-syntactic annotation systems by matching the different word-class taxonomies along the multiple dimensions. The following parts will also be based on the experience from the application of the taxonomy in a treebank project, where it helps to interface the lexicon with other tools and representations and will support user interaction with the corpus data.

All these applications share some assumptions and problems. The first assumption reflects the fact that each word class has a fixed (possibly empty) set of properties, usually morphological categories. The word classes are represented accordingly as strongly typed feature structures, where a set of attributes and their values is defined for each class. The classes are organized in a tangled hierarchy, where a class such as possessive pronoun inherits properties of the inflectional and syntactic class of adjectives and the lexical class of pronouns. The result is a 3D word class as an intersection of the classes in the individual dimensions.<sup>11</sup> Figure 2 shows the intersective type representing the possessive pronoun *jejího* (1). Each class (=type) and attribute name is preceded by a character specifying the relevant dimension: “i” for inflectional, “l” for lexical, and “s” for syntactic.<sup>12</sup>

|                       |             |
|-----------------------|-------------|
| <i>iAdj_lPrn_sAdj</i> |             |
| iLEMMA                | <i>její</i> |
| iNUM                  | <i>sg</i>   |
| iGEN                  | <i>ma</i>   |
| iCASE                 | <i>acc</i>  |
| lLEMMA                | <i>ona</i>  |
| lGEN                  | <i>f</i>    |
| lNUM                  | <i>sg</i>   |
| lPERS                 | <i>3rd</i>  |

**Figure 2.** Word class and morphological categories of the possessive pronoun *jejího*.

A similar though somewhat simpler structure (shown in Figure 3) represents the possessive form *Helenčiny*, derived from the female diminutive given name *Helenka*. Unlike *lPrn*, the lexical category *lNoun* lacks the specifications of number and person, which are only appropriate to *iNoun*.

<sup>11</sup> The number of dimensions is based on the three traditional criteria. However, see below for a discussion of other options.

<sup>12</sup> There are no attributes appropriate to the syntactic dimension in this example.

|                        |                 |
|------------------------|-----------------|
| <i>iAdj_lNoun_sAdj</i> |                 |
| iLEMMA                 | <i>Helenčin</i> |
| iNUM                   | <i>pl</i>       |
| iGEND                  | <i>mi</i>       |
| iCASE                  | <i>inst</i>     |
| LLEMMA                 | <i>Helenka</i>  |
| LGEND                  | <i>f</i>        |

**Figure 3.** Word class and morphological categories of the possessive form *Helenčinými*.

In the examples above, the values of the attributes LLEMMA and iLEMMA give the base forms of the lexeme. The lexical lemma is the primary form, which may undergo a change on its way to the analyzed form via the inflectional lemma. Here, *Helenka* is the lemma of a lexical noun, while *Helenčin* is the lemma of an inflectional adjective.

The double specification of base form seems a tempting option to represent simple cases of grammatical (as opposed to lexical) derivation. To give examples in a different language, base forms of a few German forms are shown in Table 4.

| Form               | Inflectional lemma | Gloss     | Lexical lemma     |
|--------------------|--------------------|-----------|-------------------|
| <i>unserem</i>     | <i>unser</i>       | “our”     | <i>wir</i>        |
| <i>zweites</i>     | <i>zweite</i>      | “second”  | <i>zwei</i>       |
| <i>laufenden</i>   | <i>laufende</i>    | “running” | <i>laufen</i>     |
| <i>Schifahrens</i> | <i>Schifahren</i>  | “skiing”  | <i>schifahren</i> |

**Table 4.** Examples of inflectional and lexical lemmas.

However, to cover all derivation types even in the restricted domain of grammatical derivation, a richer schema is needed. Cf. (3) where an adverb is derived from a verb in two steps, via an adjective:

- (3) ztrhat<sub>inf</sub>—ztrhaný<sub>adj</sub>—ztrhaně<sub>adv</sub>  
 “to exhaust—exhausted—in an exhausted way”

While morphological categories such as gender and number are present at least in two dimensions, word classes such as pronoun are probably specific to the lexical dimension. Indeed, each of the three dimensions may have its own set of word classes, determined by the domain. The present proposal reflects this insight to some extent, e.g., a catch-all verbal class would be pointless in the inflectional dimension, and is replaced by several classes, corresponding to different types of finite and non-finite forms, some of them shared with adjectives or nouns. On the other hand, the word class labels in the syntactic,

function-based dimension, adopted by rather simplistic analogy from the other dimensions, may be misleading in their current form. In fact, the syntactic dimension opens space for a theoretically satisfying description not only of the external, distributional properties of the item, but also of its internal, combinatorial properties. A more detailed discussion of this option is beyond the scope of this paper.

The specific number of dimensions (3) may give rise to an additional concern. Three is based on the number of criteria traditionally used to distinguish word classes. If three is too many for a particular purpose, one or even two of the dimensions could be hidden. On the other hand, there may be candidates for additional dimensions. One of them is a dimension reflecting the notions of analytical morphology, interpreting “semantic” heads of multi-word units including function and content verbs or even prepositions and nouns as having a specific value for the category of tense, mood or prepositional case.<sup>13</sup>

To sum up, each of the dimensions is justifiable for a language with some inflectional and derivational morphology. Syntactic word class takes care of a lexicon/syntax interface—it is the syntactic category that is used in grammar rules. Inflectional word class, with its lemma and morphological categories, offers a lexicon/morphology interface. Lexical word class is the locus for lexical information unaffected by morphological variations or syntactic context and expresses morphological categories used in (pronominal) reference. All this has some desirable practical consequences. A POS tagger can be trained on an appropriate subset of features, specified by choosing just some dimensions.<sup>14</sup> A corpus query searching, say, for a noun preceded by agreeing attributes, quantifiers or determiners, may be specified in a natural way. Finally, a multidimensional tagset may be more intuitive than a one-dimensional tagset based on a mix of criteria.

## 4. Language Acquisition

It has been noted before (Díaz-Negrillo et al. 2010) that a cross-classifying scheme is useful for annotating texts produced by foreign language learners. Specification of word form properties along the individual dimensions reveals some of the crucial properties of *interlanguage*, a specific language approximating the target language in the process of language acquisition. The interlingual view complements the error analysis approach by the methodologically promising concept of non-native language as a language *sui generis*.<sup>15</sup>

The non-standard features of interlanguage can thus be analyzed from several aspects. In a morphologically rich language such as Czech, interlanguage typically deviates in morphology and morphosyntax. Thus an appropriate classification of non-standard word forms can capture crucial properties of interlanguage in a systematic way and result in a principled error diagnostics and a taxonomy of morphosyntactic

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13 Cf. Jelinek et al. (2014).

14 The tagset has not yet been tested on data processed by a tagger.

15 Cf., e.g., Corder (1981).

phenomena specific to interlanguage. The main difference between the approach of Díaz-Negrillo et al. (2010) and ours is therefore in the use of a more detailed tagset, capturing other categories beyond word class such as number, gender, case, person, etc.

For example, in (4), *tatínek* “daddy” is morphologically nominative, but syntactically accusative (*viděl* “saw” requires its object to be in the accusative case), which represents a mismatch between morphology and syntax. A parallel example in English, with a mismatch in number, would be (5).<sup>16</sup> In (6a), the lexical aspect of the content verb *napsat* “to write” is perfective, while the auxiliary verb *bude* can only form analytical future tense with an imperfective form. A perfective verb is used in its present form to express future meaning, as in (6b). In (7) the adjectival form *krásný* “beautiful” is used instead of the standard adverbial form *krásně* “beautifully.” The word can be annotated as morphological adjective and syntactic adverb.

- (4) Petr viděl \*tatínek/tatínka  
 Petr saw daddy<sub>NOM</sub>/daddy<sub>ACC</sub>  
 “Petr saw his dad.”
- (5) The first year \*have/has been wonderful.
- (6) (a) \*Eva bude napsat dopis  
 Eva will write<sub>IMPF</sub> letter  
 “Eva will write a letter.”
- (b) Eva napíše dopis  
 Eva writes<sub>PERF</sub> letter  
 “Eva will write a letter.”
- (7) Whitney Houston zpívala \*krásný/krásně  
 Whitney Houston sang beautiful/beautifully  
 “Whitney Houston sang beautifully.”

As shown above, e.g., in Table 1, the three dimensions do not have to match even in standard language (cf. one of the uses of the relative pronoun *který* “that”—lexical pronoun, inflectional adjective, and syntactical noun), but some combinations, though logically conceivable, are implausible. The set of mismatches in interlanguage differs systematically from standard language; such annotation can then be used as a powerful indicator of the type of interlanguage and the language learner’s competence, and can help to build models of interlanguage by machine learning methods.

16 This and the following English examples are quoted from Díaz-Negrillo et al. (2010).

The whole scheme is currently being verified empirically by evaluating the feasibility of annotation of a non-trivial sample of Czech learner texts from the CzeSL corpus.<sup>17</sup>

## 5. Multilingual Corpora

Multilingual corpora are often annotated with language-specific morphosyntactic tagsets, which complicates the use of the annotation in contrastive studies or in multilingual applications. The preferred solution is to transform each language-specific tagset into a tagset notationally and conceptually compatible with the other tagsets according to a common standard. However, this solution is available only if the corresponding tools are at hand, which is not usually the case, as taggers are trained on different tagsets, and consistently annotated training data are seldom available even for typologically close languages.

Release 6 of InterCorp, a multilingual parallel corpus centered on Czech (<http://www.korpus.cz/intercorp/>), includes texts in 31 languages in addition to Czech. Its total size is 867 million words in Czech and 100 million words in the other languages. Texts in 16 foreign languages are annotated by word class and (some) morphological categories. Table 5 below compares the annotation of a sample prepositional phrase such as *in the long run* across the 17 available languages.

| Language | Preposition   | Determiner        | Adjective         | Noun            |
|----------|---------------|-------------------|-------------------|-----------------|
| bg       | R             | Pde-os-n          | Ansi              | Ncnsi           |
| cs       | RR-6          | PDXP6             | AAFP6---3A        | NNFP6---A       |
| de       | APPR          | ART               | ADJA              | NN              |
| en       | IN            | DT                | JJS               | NNS             |
| es       | PREP          | ART               | NC                | ADJ             |
| et       | P--s3         |                   | A-p-s3            | Nc-s3           |
| fr       | PRP           | DET:ART           | ADJ               | NOM             |
| hu       | ART           | ADJ               | ADJ               | NOUN(CAS(ILL))  |
| it       | PRE           | PRO:demo          | NOM               | ADJ             |
| lt       | prln          | jvrd              | bdvr              | dktv            |
| nl       | 600           | 370               | 103               | 000             |
| no       | prep          | det               | adj               | subst           |
| pl       | prep:loc:nwok | adj:sg:loc:m3:pos | adj:sg:loc:m3:pos | subst:sg:loc:m3 |
| pt       | SPS           | DA0               | NCFS              | AQ0             |
| ru       | Sp-1          | P--pl             | Afp-plf           | Ncmpln          |
| sk       | Eu6           | PFfs6             | AAfs6x            | SSfs6           |
| sl       | Sl            | Pd-nsg            | Agpfsg            | NcnsI           |

**Table 5.** A prepositional phrase annotated by different tagsets.

<sup>17</sup> See the project site at <http://utkl.ff.cuni.cz/learncorp/>.

The obvious notational diversity may obscure the fact that even if the tags are translated into a uniform set of labels, some of the seemingly corresponding labels have mismatching denotations. In fact, any relation between the form of the tag and its meaning is possible. As in a natural language, notationally distinct units can denote conceptually identical categories as a case of tagset synonymy. Tags in different tagsets can also be homonyms, formally identical or supposedly corresponding tags for conceptually distinct categories, but they are easily recognized by their tagset. If there is a 1:1 correspondence, such cases are easy to solve, unlike hyper- or hyponymy, where a given tag denotes a larger category than its closest equivalent in a different tagset. E.g., the English tag IN is used both for prepositions and subordinating conjunctions, while all the other languages make the distinction. Finally, two corresponding tags can share only a part of their denotations, as in Tables 6 and 7.

|         |                   |                   |                                     |                            |
|---------|-------------------|-------------------|-------------------------------------|----------------------------|
| English | <i>in</i><br>IN   | <i>the</i><br>DT  | <i>remotest</i><br><b>JJS</b>       | <i>exurbs</i><br>NNS       |
| German  | <i>in</i><br>APPR | <i>den</i><br>ART | <i>abgelegensten</i><br><b>ADJA</b> | <i>Außenbezirken</i><br>NN |

**Table 6.** Partial overlap—English JJS vs. German ADJA.

While the English tag JJS is used for superlative adjectives, ignoring the attributive/predicative distinction, the German tag ADJA covers attributive adjectives irrespective of degree.

|        |                           |   |  |   |
|--------|---------------------------|---|--|---|
| Czech  | <i>v</i><br>RR--6         | <i>těch</i><br><b>PDXP6</b>             | <i>nejodlehlejších</i><br>AAFP6----3A  | <i>zástavnách</i><br>NNFP6-----A        |
| Polish | <i>w</i><br>prep:loc:nwok | <i>tych</i><br><b>adj:sg:loc:m3:pos</b> | <i>wspaniałym</i><br>adj:sg:loc:m3:pos | <i>apartamentach</i><br>subst:sg:loc:m3 |

**Table 7.** Partial overlap—Czech PD vs. Polish adj.

Czech *těch* “those” is tagged as a demonstrative pronoun, undistinguished between attributive and substantive use, unlike Polish *tych* “that,” which is tagged as a form of adjectival declension.

What can be done about the mismatching tags? Assuming that we want to translate between the tagsets, if the source tag is more general than the target tag, lemma can be used as a clue. Obviously, this does not work for open-class categories. If the source tag is more specific than target tag, translation into the target tag suffers from a loss of information. Where there is partial overlap, the two possibilities are combined.<sup>18</sup>

<sup>18</sup> For many purposes, mapping between notationally and conceptually different tagsets and a common uniform tagset is useful, cf. Zeman (2010).

As can be seen from the above examples, the cross-classification approach is supported also by the different ways the individual tagsets are designed. Some show a distinct preference for one dimension: Czech for lexical classes, Polish for inflectional classes, and German for syntactic classes. A proper understanding and representation of their meaning is necessary in order to pose precise queries while searching the multilingual corpus—the corpus search interface can at least offer a uniform or compatible choice of linguistic categories for each language, in the specific dimensions. The multidimensional system also helps us to understand the results, relate and compare the tagged texts across the individual languages, and project annotation from one language to another.

If the denotation of each tag is known by its mapping onto an interlingual taxonomy, the language-specific tags can be properly located in the multidimensional space of word classes and the mismatches can be made explicit, and sometimes even resolved, by projecting a more detailed annotation to less specific word-aligned parallel text. The properly understood tags can even be related to a standard ontology of linguistic categories (e.g., Patejuk and Przepiórkowski 2010; Chiarcos and Erjavec 2011; Chiarcos 2012).

## 6. Conclusions

Although cross-classification approaches have been proposed and discussed before, they have not found their way into common linguistic practice, despite their theoretical and practical appeal. We hope to have given some support for a 3D taxonomy of word classes using arguments from the practical domains of corpus and applied linguistics. Annotation of corpora, including treebanks, by a cross-classifying tagset facilitates both corpus queries and their use by application tools. Such taxonomy could also be a powerful analysis tool for texts produced by non-native speakers and for acquisition phenomena in general. Finally, disparate morphosyntactic annotations of multilingual corpora can be harmonized when the concepts behind language- or theory-specific tagsets are properly located in the 3D space of word classes.

The proposed scheme will continue to be tested in different domains (treebank annotation, language acquisition, harmonizing tagsets in a multilingual corpus), and modified/refined to suit the tasks and, hopefully, to find application in other domains, too.

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## Corpus

*Czech National Corpus – InterCorp*. Institute of the Czech National Corpus. Available online at <http://www.korpus.cz>.

# Truth Is, Sentence-Initial Shell Nouns Are Showing Up Bare

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**Abstract:** In one subtype of English shell noun construction, the noun serves as the subject in a pre-clausal unit, e.g., “The thing is.” Shell noun NPs have mainly been investigated synchronically, often as case studies of particular noun types, with the bare forms only ever briefly noted. Data from COCA and COHA was examined to collect the range of sentence-initial bare form shell nouns, to track any changes in their use occurring between 1810 and 2012. The findings suggest that, referentially, these abstract bare forms function differently than bare concrete count nouns, and distributionally, that bare shell forms are used increasingly in subject position, confirming their state as grammaticalizing discourse marker constructions.

**Keywords:** bare nouns; shell nouns; discourse markers; diachronic English; grammaticalization.

## 1. Introduction

Recent work has established a set of English nouns which, while normally found as count nouns, also occur lacking both articles and plural forms in a non-mass, non-count use that has the distribution of a full NP (e.g., *she was in **prison**, they ate at **home**, we left **school**, **camp** was exhausting*). The most frequent uses for these bare singular count nouns (BSCNs) occur when they are in PPs, where they may be used to refer to individuals or kinds (Stvan 2007), or to capacities (de Swart et al. 2007). These contrast with other restricted semantic sets of bare singulars that occur as predicates, and not as arguments at all.

In a number of languages, including English, a quite limited set of BSCNs appear in subject position (Stvan 1998). A systematic look at which bare singular forms do show up in subject position, and the ways that these words are interpreted, is now more easily

possible due to larger corpora that are tagged for part of speech (POS), though such searches are still hampered by the fact that bare singulars are not an identified subset; most POS tagsets allow a search for “common nouns that are not plural,” but these do not separate out the vast number of mass nouns from the more marked set of bare singular NPs.

While a subset of bare concrete location nouns shows up as subjects (e.g., *home is where the heart is*, *school kept them busy that week*) this paper focuses on another set of bare subject nouns—constructions with bare abstract count nouns in pre-clausal position. Often taken to be colloquial variants, typical instances include *Truth is*, *Problem is*, and *Trouble is*. This paper opens up the set of abstract nouns that are subjects in pre-clausal constructions to look at those that lack articles. The goal is to show what the behavior and frequency of these bare forms might reveal.

Just as BSCNs are most often found in PP constituents, these abstract bare forms are frequently examined as subjects in a clause-like unit that itself precedes another full clause, as seen in the examples in (1). The main “complement clause” can be a statement, as in the underlined sections of (1a) and (1b) or a question, as underlined in (1c) and (1d); while the pre-clausal unit provides the kinds of evidential, attitudinal, and meta-talk information often conveyed by discourse markers (Schiffirin 1987).

- (1) (a) “Truth is, he’s never seen anybody bust their head falling off a bike, but he’s seen a few people crash.” [COCA:*The Antioch Review*, 2009]
- (b) “They aren’t real monks, anybody can tell that. Trouble is, our robes and our rules of silence make anonymity so easy here, and monastic discipline makes questioning authority so hard.” [COCA:*Fantasy & Science Fiction*, 2007]
- (c) “Question is, will they make history by making space tourism possible?” [COCA:*Anderson Cooper 360°*, 2004]
- (d) “Yeah, yeah. Thing is, how’d you figure it out?” [COCA:*Analogue*, 1999]

Keeping these kinds of structures in mind, the paper addresses the topic in the following ways: Section 2 offers a look at relevant previous literature on bare nouns, shell nouns, and discourse markers. Section 3 looks at these noun forms, focusing on their position with sentences, offering, in particular, some motivation for looking at shell nouns as subjects, a discussion of whether these functions vary if the noun phrase has an article or is bare, and then an analysis of the referential uses of these constructions. Section 4 presents a look at the corpus methods used to obtain the data. The data is analyzed in Section 5, for both synchronic and diachronic corpora. I conclude by detailing implications that follow from a change in frequency of bare form subjects.

## 2. Literature Review

A number of aspects of both shell noun and bare noun behavior have been looked at in the past 15 years. The current findings intersect with the following areas of research: work on shell nouns: Schmid (2000), Delahunty (2011; 2012); on bare singular count nouns: Stvan (1998; 2007); on bare NPs as referring expressions: Carlson and Sussman (2005); Kolhatkar et al. (2013); and on these forms as types of pragmatic markers: Aijmer (2007), Günthner (2007), Brinton (2010), and Keizer (2013). I pull these together below to describe two aspects of these constructions: their grammatical position and their discourse function.

### 2.1 On Shell NPs in Subject Position

The nouns under discussion have abstract referents (*thing, problem, issue*), leading Schmid (2000) to call them “shell nouns”—words that do not have much semantic content, serving instead as shells for a type of information. In this paper I focus on one template in which shell nouns occur, as subject of a copula forming a pre-clausal unit. As subjects, of course, these are actually noun phrases, not nouns, regardless of whether they appear with an article, a modifier, or are completely bare.

Distributionally, these pre-clausal units are similar to a subset of discourse markers that Brinton (2010, 285) refers to as “abridged clauses,” which includes items like *you know, I mean, or you see*. These *truth is* type clauses, however, differ from the abridged discourse marker clauses in that they cannot occur throughout a sentence, but are found only pre-sentence initially, and, more particularly, are used to introduce a second clause, sometimes with an optional complementizer. (Though see Günthner [2007] on characteristics that, in German versions, make the two components not typical of the “matrix clause” and “subordinate clause” labels.) The template variations for this shell noun construction are shown in (2), i.e., there is an optional article, optional comma, and optional complementizer.

(2) (the) truth is (,) (that) [you didn’t show up]

Delahunty (2012) calls these units “*thing* sentences.” He mentions the small number of bare forms that are found, concluding that this is essentially a definite NP form. In particular, he cites his earlier work, which found that “97% of . . . examples were definite,” and work by Brenier and Michaelis (2005), who found that “so many of their examples were definite that they concluded that definiteness is a defining characteristic of the construction.” He also notes Brenier and Michaelis’s claim that the forms “are highly lexically restricted, [and] have an invariant morphological form (they contain the definite article)” (Delahunty 2012, 60). In that explanation, however, it seems that definiteness is assumed by the presence of a determiner, although recent work in nominal expressions has noted the mismatch between some NP forms and their referent’s identifiability (Carlson and Sussman 2005; Stvan 1998).

Regarding the bare shell noun forms, Delahunty notes that “*Thing* sentences allow a number of elisions that are associated with factors such as style, register, and mode” which allow the definite article to be dropped, but that “their meanings and discourse functions are identical to those of full TSs” (Delahunty 2012, 42). The current paper calls into question the claim that the bare forms are identical in discourse function to the articulated version.

## 2.2 On DMs as Grammaticalized Items

These pre-clausal units, do, however, fit several aspects of the general description of discourse markers summarized by Brinton (2010). For example, they “preferentially occur in sentence-initial position. They are syntactically independent elements that are loosely attached to (parenthetical to) their host clause and often constitute a separate intonation unit. . . . They occur with high frequency, especially in oral discourse, and may be stylistically stigmatized” (Brinton 2010, 285). Indeed, stylistically, at first glance they have a “homey” or “colloquial” sense. But what more formally characterizes the nouns used in this way?

This set of [abstract count noun + verb] units has been discussed specifically and extensively by Schmid (2000) as a sub-pattern of shell noun use. Their position before a clause led Biber et al. (1999) to call the clausal units “utterance launchers.” Functionally, Günthner (2007, 6) categorizes them as projector-phrases, “a rhetorical deferral of the focal” to the following material; she notes that this idea “lines up with certain tendencies in grammaticalization” (2007, 15).

They have been framed as a kind of text deixis or “discourse label” that names or announces the format of the larger entity being discussed (Francis 1994). A variation of this construction containing a definite noun followed by two copula forms (“the thing is is”) was analyzed by Tuggy (1996), created where an NP plus copula merges with a focus formula, though I will not explore these here.

In examining four particular NP types in pre-clausal NP + copula forms from BNC data, Aijmer (2007, 39–40) also suggests that these forms are undergoing grammaticalization, whereby the unit is moving from a traditional matrix clause to a position as a pre-front field constituent, and on to a pragmatic marker, during which the semantic meaning is bleached, and the unit is pragmatically enriched. Keizer (2013) also notes that this construction serves as a pragmatic-rhetorical marker with a presentative function. All these authors emphasize the marked discourse function of the form, but focus primarily on the articulated noun and a synchronic description of the construction’s use.

## 2.3 The Present Research Questions

It is clear that a number of questions have begun to be asked about these bare shell noun forms. The present work started out with a set of descriptive issues, as shown in (3).

- (3) (a) What is the range of forms used in these constructions?
- (b) Do the nouns share any lexical semantic features?
- (c) Do the phrases share any discourse uses?
- (d) What words are excluded from this position?
- (e) Are they all possible with articles, too?

Several of these issues were briefly examined above. But in particular, this paper will look at the following more focused research questions:

RQ 1: Are these nouns used referentially?

- 1a) Are they any less referential when lacking an article?

RQ 2: Is there evidence of diachronic movement towards bare *truth is* forms?

- 2a) Is it happening any more across time?
- 2b) And, if so, does that signal grammaticalization?

In short, I am specifically interested in the smaller percentage of uses when the article of the pre-clausal NP can be deleted, in whether this functions semantically or pragmatically any differently than the version with a full NP, and whether this ratio of bare to full is changing. I will start by taking a look at some differences that show up based on the distribution of bare shell nouns within a clause. These sentence types are often examined as a semi-fixed construction. One piece of evidence of their template-ness is that shell nouns in other grammatical positions cannot show up bare in the same way.

### 3. Grammatical Position of Bare Forms

#### 3.1 Distribution of the Shell NPs

First of all, we can see that variants of [Noun *is*] sentences can also show up with the shell noun occurring in a more rightward position in a pre-clausal unit, as in the pre-clausal construction *Here's the thing*. However, when the shell noun is in the position after *is*, the article cannot be dropped. While example (4) shows that in the pre-clausal position the article is optional for the subject nouns, this is not the case when the noun occurs after the verb. It is ungrammatical to begin with *Here's thing*, and likewise with

other such nouns, as shown in (5). So some of the ability of the nouns to show up bare has to do with their position in the sentence, or their slot in the construction.

- |     |     |                                      |             |           |
|-----|-----|--------------------------------------|-------------|-----------|
| (4) | (a) | The thing is, she's not home.        | pre-copula  | + article |
|     | (b) | [ ] Thing is, she's not home.        | pre-copula  | - article |
| (5) | (a) | Here's the thing, she's not home.    | post-copula | + article |
|     | (b) | *Here's [ ] thing, she's not home.   | post-copula | - article |
|     |     | *Here's [ ] problem, she's not home. | post-copula | - article |
|     |     | *Here's [ ] issue, she's not home.   | post-copula | - article |
|     |     | *Here's [ ] deal, she's not home     | post-copula | - article |

As noted earlier, tagged corpora make it easier to focus on gathering subsets of examples of lexical categories from texts, but separating mass and count, let alone smaller subsets such as bare singular count nouns, is still tricky. Such is the case with (COCA) the Corpus of Contemporary American English, which uses the Claws7 tagset. Initial searches in COCA for a non-plural noun followed by the word *is* bring up mainly mass nouns, gerunds, and names, in the noun slot. (Top subject hits are *life, admission, cost, problem, truth, congress, it, love*). Also, not all readings of English nouns have distinct morphosyntactic indicators. So there can be false positives involving identical looking mass and count nouns. For example, in (6) we can see contrasts with the noun *truth*:

- |     |     |  |
|-----|-----|--|
| (6) | (a) | Truth is stranger than fiction<br>[mass, referential subject]                              |
|     | (b) | All truths are easy to understand once they are discovered<br>[count, referential subject] |
|     | (c) | The truth is, he didn't do it.<br>[count, pragmatic unit, referential?]                    |
|     | (d) | Truth is, he didn't do it.<br>[count, pragmatic unit, referential?]                        |

The word *truth* can be countable and can also be used as a mass noun. In (6a) we can see that the combination *truth is* can show up as a mass noun used referentially, where it takes a predicate; in (6b) *truth* is a countable noun used referentially. In the constructions of

interest, in (6c) and (6d) we see a freestanding phrasal unit that introduces a clause, which can be used with both articulated and bare forms.

I suggest that the (6c) and (6d) forms are countable, with (6d) representing an NP with a deleted article. But are the NPs in (6c) or (6d) referential? One test is to check for their use in discourse anaphora. For example, *the truths* in (6b) can be referred back to with the pronoun *they*. But with the pre-clausal uses in (6c) or (6d), this is more problematic.

### 3.2 Occurrence in Discourse Anaphora

Further illustration of their referential qualities can be seen by examining the constructions with regard to discourse anaphora.

- (7) (a) The truth<sub>i</sub> is, we don't have enough cash. #It<sub>i</sub> is a big one.
- (b) "The trip<sub>i</sub> was meant to encourage Syria along the path of peace. Problem<sub>j</sub> is, it<sub>i</sub> didn't." [COCA:Time, 1994]
- (c) The truth<sub>i</sub> is that you're never going to know<sub>i</sub>.
- (d) The truth<sub>i</sub> is, which is a fact you'll have to acknowledge<sub>i</sub>, that you're never going to know<sub>i</sub>.

In (7a), direct co-reference with a pronoun does not work for *the problem*. In (7b), an example from the corpus, the word *it* shows up in the following sentence, but not as coreferential with *problem*; it co-refers with an NP from earlier in the discourse. In (7c), we see that what these shell nouns are co-referential with is the entire clause that they introduce, a unit they foreshadow and name. Thus, the pre-clausal shell nouns have a kind of text deixis function where the referent is the upcoming clause. And in (7d), we see that the shell noun can be coreferential with a restatement that is an elaborately modified NP, as well as with the clause it is introducing. So while pronouns do not work well here in anaphora, shell nouns can be referred back to by later recaps or syntactic elaborations of the clause.

However, this seems partly sensitive to whether the noun and verb of the pre-clausal units are kept together or divided by the follow-up clauses. This can be seen by examining instances of non-splittable antecedents in (8).

- (8) (a) The truth<sub>i</sub>—and it<sub>i</sub>'s a doozy—is that you'll need to eat cookies every day.
- (b) \*Truth<sub>i</sub>—and it<sub>j</sub>'s a doozy—is that you'll need to eat cookies every day<sub>i</sub>.

- (c) “Thing<sub>i</sub> is, and I have learned this<sub>j</sub> from working at the—the, with the tribal people, the Coeur d’Alene people, I never understood how important it was to know where you came from.” [COCA:*Larry King*, 2001]
- (d) “Truth<sub>i</sub> is, though, and you know it<sub>i</sub> at sight and without a second thought, Barfoot has known every kind of pain<sub>i</sub>.” [COCA:*Virginia Quarterly*, 1990]

In (8a), the articulated form can be referred back to with a pronoun, while in (8b), the bare form cannot. However, there is also a contrast between (8b) and (8c), where both forms start with bare nouns. But with (8c), the pronoun occurs after the completion of the pre-clausal *truth is* unit.

It is not, however, just the intactness of the pre-clausal unit that limits the use of following pronouns. Their further discourse anaphoric abilities via later pronouns are quite rare: only three examples showed up in in COCA, shown in examples (8c), (8d), and one other. This suggests a limited and very different referential ability than that shown by concrete bare singular count nouns (Stvan 2007).

One aspect not tracked in these short text excerpts is cases where the article is called for due to previous mentions of the referent. (One such tactic is explored by Kolhatkar et al. [2013] who present computational methods to find such earlier mentioned referents of NPs made up of anaphoric shell nouns such as *this issue*. Their method is to reverse engineer the hunt, focusing on cataphoric shell NPs which have immediately following antecedents, e.g., *The fact that x* to use as training data to annotate future discourse anaphora.)

Bare forms also show up with pre- and post-modifiers, indicating that the *truth is* type construction is not a question of light vs. heavy NPs. For certain nouns, modification also interacts with ability to lack an article.

### 3.3 Bareness and Modification of These Shell Noun NPs

Aijmer (2007, 33) notes two aspects of *fact is* constructions in British English: when the complementizer “*that* is present the definite article must also be present. There were no examples such as *fact is that* (a single example was found in the whole BNC) . . . When *the* is missing, *fact* is not usually preceded by an adjective (\*Simple fact is, \*simple fact is that).”

In American English, the bare form collocation of *fact is that* also shows up low in frequency; there were only two examples found in COCA. And no examples show up of unarticulated *fact* preceded by an adjective. Others of these shell nouns, however, showed up many times with adjectives, as either bare forms + *that* or as sentence-initial bare forms.

Bare forms show up with post-modifiers, as typified in (9a–c), and with both pre- and post- modification, as in (9d).

- (9) (a) “**Thing I like about Stairmaster is**, it requires only about the minimum of 20 minutes, and you can—in and out, and you’re off and starting your day. That’s the thing I like.” [COCA: *Morning Workouts*, 1998]
- (b) “Hi. Great show. **Question I haven’t heard on the show yet is** about the effect of demographics on the market.” [COCA: *Talk of the Nation*, 2000]
- (c) “**Problem with that is**, it might be Bush’s war, but it’s General Piraeus’s strategy.” [COCA: *Fox News All-Stars*, 2007]
- (d) “**Great thing about this site is** you can get clothing—designer clothing at amazing discounts.” [COCA: *CBS Morning*, 1998]

To explore bare form distribution, and knowing that bare forms in particular occur less often, I mined two corpora of American English for examples. These sources are detailed in the Methodology section below.

#### 4. Methodology and Data Sources

I queried two online corpora of American English: the Corpus of Contemporary American English (COCA), containing 450 million words, from texts from 1990–2012, and the Corpus of Historical American English (COHA), composed of texts from 1810–2009, which contains 400 million words in total, but contains fewer sources in the older sections. Tokens were found by exploiting the built-in POS tags, such as the query illustrated in (10). This query asks for all instances of punctuation (so that what follows a comma, semi-colon, period, or quotation mark will include clause-initial forms), followed by a non-plural noun, followed by all forms of the word *be*, followed by another piece of punctuation (a comma, a period, a colon, a dash, etc.).

(10) [y\*] [\*nn1\*] [vb\*] [y\*]

I also queried with the final element replaced with a symbol for conjunction [c\*], to gather examples where no punctuation separates the two components, but instead, the second clause starts with a complementizer such as *that*, *whether*, *if*, etc.

#### 5. Analysis of the Synchronic Corpus Data

##### 5.1 Range of *Be* Forms Found

The range of inflectional forms of the word *be* in the pre-clausal units was examined, since in studies of particular nouns, other researchers have noted that these copular forms are limited primarily to simple forms (e.g., Kolhatkar et al. [2013, 302]:

“they are generally expressed in the present tense”; Aimer [2007, 32]: the formula “has a fairly fixed form with a copula in the present tense”; Keizer [2013, 291]: the construction “only allows simple tenses, and in the large majority appears in the present”). In the corpus, the copula did show up more often followed by present, rather than past or participle forms of *be*, though not exclusively so. The outcome of searching for simple tenses can be seen in Table 1. (More complex tenses, however, can also be found, e.g., where clauses follow *the problem’s been*, *the problem will be*, *the problem is going to be*, *the problem could be*, and *the problem would be*.)

| Bare N + is |     | Bare N + was |     | Bare N + being |   |
|-------------|-----|--------------|-----|----------------|---|
| problem     | 296 | problem      | 91  | point          | 7 |
| truth       | 285 | trouble      | 79  | reason         | 3 |
| trouble     | 275 | time         | 56* | difference     | 1 |
| fact        | 207 | truth        | 53  |                |   |
| thing       | 131 | word         | 44  |                |   |
| word        | 116 | thing        | 21  |                |   |
| question    | 48  | fact         | 13  |                |   |
| point       | 42  | rumor        | 10  |                |   |
| rumor       | 18  | question     | 5   |                |   |
| reality     | 7   | point        | 5   |                |   |
| reason      | 5   |              |     |                |   |
| speculation | 5   |              |     |                |   |

**Table 1.** Inflections of *be* found in “problem is” type constructions.

Table 1 shows that while the majority of the cases use *is*, a fair number use the past tense. The smallest number use *being*, which can be parsed not so much as a progressive form of the copula, but rather as functioning like other participle forms that precede full clauses to convey causative conjunctive meaning. As such, they resemble constructions like those with *granted* and *given*, as shown in (11c) and (11d).

- (11) (a) And you, you, you can bolster that argument in many, many ways. Point being we are living at a time when society is the most complicated, interconnected, immediate we’ve ever seen. [COCA: *Meet the Press*, 2011]
- (b) I want to make sure our tee shot goes past Tiger’s, reason being, Tiger has a certain reputation—deserved, deserved-for putting on these shows on the last hole [COCA: *Sports Illustrated*, 2000]

(c) Strangely, it didn't hurt at all-perhaps not so strangely, granted that she was swaddled in armor. [COCA:*Queen of Candescence*, 2007]

(d) It seems like it would be a natural, given it's the one thing that the speaker hasn't addressed. [COCA:*All Things Considered*, 1995]

## 5.2 High and Low Frequency Nouns Found

Table 1 showed the numbers for each COHA and COCA hit for the most frequent tokens occurring with the present tense, those with five or more hits. For a look at the variety of shell nouns that shows up with this form, we might take a look at the tail, down to those with just one hit, as shown in Table 2.

| Bare N + is |
|-------------|-------------|-------------|-------------|
| deal        | 4           | conclusion  | 1           |
| story       | 3           | controversy | 1           |
| challenge   | 2           | danger      | 1           |
| consensus   | 2           | difference  | 1           |
| explanation | 2           | downside    | 1           |
| legend      | 2           | effect      | 1           |
| part        | 2           | evidence    | 1           |
| pity        | 2           | history     | 1           |
| scenario    | 2           | irony       | 1           |
| strategy    | 2           | kicker      | 1           |
| chance      | 1           | proof       | 1           |

**Table 2.** Less frequent nouns before *is*.

## 5.3 Expletive Subject Equivalents

The asterisk in Table 1 indicates that *time was* seems to work a bit differently than the other [Noun *be*] collocations. In addition to *time* being one of the few shell nouns that shows up only with the past tense verb, *time was* conveys a distinct meaning, as shown in the contrasting examples in (12).

(12) (a) [M]ore and more parents are after a name that stands out, that is actively, obviously different from other kids' names. A name that's cool. Time was, most kids were named what everyone else was named: for family members or saints, or following traditional ethnic or religious protocol. [COCA:*Parenting*, 2007]

- (b) Something only angel warriors could do. Or so he'd thought. Problem was, she wasn't an angel. [COCA:*The Darkest Secret*, 2011]

The difference arises from the intersection of aspect and givenness. The collocation *time was* sets up the existence of an era crucially having occurred in the past, as seen in the first line of each the paraphrases in (13). This highlighting of a referent existing and having been completed in the past cannot be similarly conveyed by *There was a problem/fact/question/truth*, as underscored by the adverb *once* added to these paraphrases.

- (13) (a) Time was,            “There (once) had been a time when”  
                                      #“There (now) was a time, which was”  
                                      #“It was a time when”
- (b) Problem was,            #“There (once) had been a problem that”  
                                      “There (now) was a problem, which was that”  
                                      “It was a problem that”
- Fact was,                    #“there (once) had been a fact that”  
                                      “There (now) was a fact which was that”  
                                      “It was a fact that”
- Question was,            #“there (once) had been a question whether”  
                                      “There (now) was a question which was that”  
                                      “It was a question whether”
- Truth was,                   #“there (once) had been a truth that”  
                                      “There (now) was a truth, which was that”  
                                      “It was a/the truth that”

Conversely, as seen in the second lines of the examples in (13), a way to capture the difference among [Noun *was*] tokens is that the present-day reading can be shown by the use of the adverb *now*, which works for all the nouns except *time*. This suggests a reading of the second-line examples as presentational, rather than existential constructions, despite the presence of the same copula verb in the first and second lines. (Without the adverbs, this reading is initially obscured because presentational forms are more often construed with non-*be* verbs, such as *showed up / appeared / stood / arose*).

Lastly, the distinctive characteristics of *time was* can also be captured in the ability to be recast as a sentence with an *it* expletive subject. To keep the same meaning as the pre-clausal *Time was* unit, *time* cannot be introduced as a new referent with an *it* sentence, since the time being discussed evokes an already existent, and completed era as its referent.

The other shell nouns, however, can be set up by a sentence that introduces the problem/fact/question, etc., with an indefinite noun form, as seen in the third row of examples.

These contrasts suggest that in the past tense form, the pre-clausal construction [Noun *be*] masks at least two underlying readings that can be distinguished by attempting to move the shell noun to a position after the copula.

## 6. Analysis of the Diachronic Corpus Data

Finally, following up on the idea that phrases becoming discourse markers might grammaticalize into a new function and position over time, I wanted to investigate the diachronic use of these pre-clausal units. Table 3 shows the results of my exploration of the occurrences in 25-year chunks between 1810 and 2012.

| Timeframe        | Bare Shell Noun + is<br>+ punctuation | Bare Shell Noun + is<br>+ complementizer |
|------------------|---------------------------------------|--|
| 1810–1834 (COHA) | 3                                     | 0  |
| 1835–1859 (COHA) | 8                                     | 0  |
| 1860–1884 (COHA) | 25                                    | 0  |
| 1885–1909 (COHA) | 39                                    | 1  |
| 1910–1934 (COHA) | 57                                    | 8  |
| 1935–1959 (COHA) | 67                                    | 18                                       |
| 1960–1989 (COHA) | 108                                   | 15                                       |
| 1990–2012 (COCA) | 1183                                  | 104                                      |

**Table 3.** Raw data for bare shell nouns.

However, there are fewer texts in each of the earlier eras of the corpus. So I have normed for number of hits per 1,000,000 in each of the rows. You can see the normed data in Table 4.

| Timeframe        | Bare Shell Noun + is<br>+ punctuation | Bare Shell Noun + is<br>+ complementizer |
|------------------|---------------------------------------|--|
| 1810–1834 (COHA) | 0.2                                   | 0  |
| 1835–1859 (COHA) | 0.2                                   | 0  |
| 1860–1884 (COHA) | 0.54                                  | 0  |
| 1885–1909 (COHA) | 0.72                                  | 0.018                                    |
| 1910–1934 (COHA) | 0.94                                  | 0.13                                     |
| 1935–1959 (COHA) | 1.10                                  | 0.296                                    |
| 1960–1989 (COHA) | 1.46                                  | 0.20                                     |
| 1990–2012 (COCA) | 2.48                                  | 0.23                                     |

**Table 4.** Normed data for bare shell nouns.

In the 400 million words from 1810–1989, a total of 307 tokens of pre-clausal units with bare shell nouns were found, while in the 450 million words of COCA non-academic texts, 1183 tokens occurred. Even normed, a noticeable increase can be seen in the use of bare form, pre-clausal *truth is* type constrictions. The number of noun types involved also greatly increased. To see whether a relative change has occurred in bare forms compared to articulated forms, I also tracked the use of articulated shell nouns in pre-clausal units. These findings are shown in Table 5.

| Timeframe        | Article + Shell Noun + <i>is</i> + punctuation |        |
|------------------|--|--------|
|                  | Raw  | Normed |
| 1810–1834 (COHA) | 310  | 20.518 |
| 1835–1859 (COHA) | 833  | 21.07  |
| 1860–1884 (COHA) | 811  | 17.58  |
| 1885–1909 (COHA) | 579  | 10.69  |
| 1910–1934 (COHA) | 481  | 7.95   |
| 1935–1959 (COHA) | 371  | 6.11   |
| 1960–1989 (COHA) | 642  | 8.73   |
| 1990–2012 (COCA) | 8485   | 18.86  |

**Table 5.** Raw and normed data for articulated shell nouns.

Table 5 shows that the articulated form peaked earlier than the bare forms. The bare forms showed a slow but steady increase over the decades, while the articulated forms have slowly lessened in percentage, though the occurrence of both forms of the pre-clausal constructions has increased. This strengthens the argument that the pre-clausal forms are grammaticalizing into this new position and function, and away from a regular main clause use.

## 7. Conclusions

Future investigations of the bare forms in pre-clausal units will explore variation within the construction use, to determine which forms might be leading the change in function. Another direction to explore is whether different nouns are used more commonly in different registers and genres. Throughout, the approach will be to gather and contrast the behavior of the full range of nouns. For although Schmid (2000) covered many articulated shell nouns, most of the previous literature explores only individual shell noun types. For example, while noting that variants exist in which the “noun may range in semantic specificity from the minimal *thing* to semantically far richer nouns such as *miracle*,” Delahunty (2012, 43) examines only structures with the noun *thing*, Krug and Schützler (2013) look at *idea*, Aijmer (2007) looks at only the four nouns, *fact*, *truth*,

*thing, trouble*, etc. These individual case studies offer invaluable data points, which the present work builds on to show the benefit of examining the bare form of all the noun types found in this construction.

Through this initial overview of bare shell nouns in pre-clausal units, I have shown that they have limited referring abilities beyond identifying their complement clauses. Indeed, bare forms, especially those stranded from the verb in the unit, cannot be referred back to by pronouns. Distributionally, bare forms show up as subjects when they cannot show up after a verb, so referentially, these abstract bare forms function differently than bare concrete count nouns in discourse anaphora. In addition, looking across the full set of nouns used in the current pre-clausal form also allows us to unmask two underlying readings—an existential and a presentational construction—that can be distinguished by attempting to move the shell noun to a position after the copula. Finally, as a pre-clausal unit, the reduced forms, lacking both determiner and complementizer, are being used more often, and used more steadily across time. Together these findings support the idea that the truncated clauses are grammaticalizing.

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# Exploring Hungarian and Dutch Gestural Demonstratives

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**Abstract:** This paper examines various hypotheses regarding the choice of Hungarian and Dutch proximal and distal gestural demonstratives, i.e., demonstratives accompanied by a pointing gesture, in an experimental framework. Using the so-called scripted dialogue technique, the study demonstrates that there is a significant difference between the choice of gestural demonstratives that depends on the nature of the context (non-contrastive vs. contrastive). In non-contrastive contexts accessibility as a factor is ruled out, but the traditional factor of distance plays a crucial role. In contrastive contexts the pattern of demonstratives changes, i.e., in contrastive contexts distance as a factor competes with some other factors.

**Keywords:** deixis, proximal and distal, gestural demonstratives, Hungarian, Dutch.

## 1. Introduction\*

Deixis is an intriguing linguistic phenomenon at the semantics/pragmatics interface; it is extremely widespread in everyday speech. “The term deixis refers to a class of linguistic expressions that are used to indicate elements of the situational and/or discourse context, including the speech participants and the time and location of the current speech event” (Diessel 2012, 2408). Demonstratives form a central issue within studies on deixis. In this paper the results of a production experiment are presented, investigating the use of Dutch and Hungarian demonstratives, and more specifically,

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\* We are grateful to an anonymous reviewer for useful remarks on a previous version of the paper.

those uses of demonstratives where some sort of extra-linguistic gesture is present. The relevant literature disagrees on the factors influencing the choice of demonstratives. Recently the traditional factor of distance has been challenged, and new factors, such as accessibility or salience, have been suggested to replace distance. We examined three factors— distance, accessibility and contrastiveness—in two typologically different languages. To broaden the scope of the available data sources we attempted to reinforce the results of previous experiments (see, for instance, Tóth 2014b for English results) by investigating Hungarian, which belongs to the Finno-Ugric language family, and comparing the results with data on Dutch, a Germanic language, obtained in an identical experimental setting.

## 2. Demonstratives in Dutch and Hungarian

Most languages have a two-way deictic system (English), but in other languages (e.g., Irish) there is a three-way distinction (Diessel 2012). Dutch and Hungarian contain two demonstrative terms, traditionally referred to as proximals and distals. In Dutch, depending on gender and plurality, *dit* (*het*-words) and *deze* (*de*-words) are proximals, plural *deze*; *dat* (*het*-words) and *die* (*de*-words) are distals, plural *die*.

- (1) (a) *Dit* *meisje*  
 this-DEM.PROX.SG.FEM girl  
 kan goed skateboarden.  
 can-PRESENT.3SG good skateboard  
 “*This girl* can skateboard well.”
- (b) *Deze* *voetbalfinale* is heel spannend.  
 this-DEM.PROX.SG.FEM soccer final is very exciting  
 “*This soccer final* is very exciting.”
- (c) *Deze* *fietzen* zijn duur.  
 this-DEM.PROX.PL. bike-PL are expensive  
 “*These bikes* are expensive.”
- (2) (a) *Die* *jurk* wordt verkocht in de winkel.  
 that-DEM.DIST.SG.FEM dress is sold in the shop  
 “*That dress* is being sold at the shop.”
- (b) De jongen droomt over *dat* *meisje*.  
 the boy dream-PRES.3SG about that-DEM.DIST.SG girl  
 “The boy dreams about *that girl*.”

- (c) De vrouw zou graag die surfplanken uitproberen.  
 the woman would like those-DEM.DIST.PL surfboard.PL try  
 “The woman would like to try *those surfboards*.”

In Hungarian *ez* “this” and *eze* “these” are proximal demonstratives, whereas *az* “that” and *azok* “those” are distals.

- (3) (a) *Ezt/ezeket* kérem.  
 this/these-DEM.PROX.ACC.SG/PL want  
 “I want *this/these*.”
- (b) *Ez a kulcs* nyitja az ajtót.  
 this-DEM.PROX.SG the key open-PRES.3SG the door-ACC  
 “*This key* opens the door.”
- (4) (a) *Azt/azokat* add ide!  
 that/those-DEM.DIST.ACC.SG./PL give here  
 “Give me *that/those*.”
- (b) *Az az autó* az enyém.  
 that-DEM.DIST.SG the car the mine  
 “*That car* is mine.”

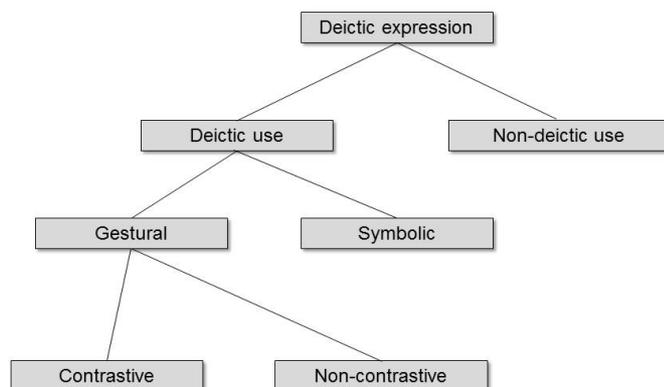
As illustrated by the examples above, in Indo-European languages demonstratives can either be used as independent pronouns (*dit* “this”) or they may function as a modifier of a co-occurring noun (*dit huis* “this house”) (Diessel 1999). From a syntactic point of view, Hungarian demonstratives (*ez, az, ezek, azok* “this, that, these, those”) constitute a full DP. When the demonstrative modifies an NP, a definite article is inserted between the demonstrative and the head noun (compare this with English and Dutch). The whole phrase is treated as a DP containing two coordinated DPs, which receive case markers (*ez a könyv* “this the book = this book,” *ez-t a könyv-et* “this-Acc.SG the book-Acc.SG = this book”) (É. Kiss 2003). This is an interesting and yet relatively unexplored phenomenon in Hungarian; however, for present purposes these constructions will not be differentiated.

As suggested by the results of various experiments, language users have strong intuitions about the use of demonstratives (see, for instance, Maes and De Rooij 2007). It is a widespread belief that proximal demonstratives are used to refer to objects that are close to the speaker, whereas distal demonstratives are used to refer to objects that are further away (Fillmore 1971/1997). However, recent linguistic research proposes that the choice between a proximal and a distal demonstrative is not so straightforward. For instance, Diessel (1999) states that “These labels [proximal/distal] are, however, only

rough approximations. The meaning of a demonstrative is often more complex” (Diessel 1999, 160). Various authors also argue that the traditional analysis of demonstratives is not always adequate to characterize the meaning and use of demonstratives (see Enfield 2003, Levinson 2004, Piwek et al. 2008, Sidnell 2009). It has also been assumed that other factors may play an essential role in the choice of demonstratives. For instance, Piwek et al.’s (2008) work on Dutch proposed accessibility as a basic factor influencing the choice of demonstratives. The experiment to be presented here tested the role of three factors in the choice of Hungarian and Dutch gestural demonstratives: distance, accessibility, and contrastiveness in linguistic contexts. (For further discussion see Section 4.1.)

### 3. Different Uses of Demonstratives

Demonstratives can fulfill various pragmatic functions in everyday interactions. A taxonomy of demonstratives, based on Levinson’s (2004) and O’Keeffe et al.’s (2011) work, is given in Figure 1. For a detailed description of this taxonomy we refer the reader to Tóth (2014b). Here only brief definitions and a few examples will be presented.



**Figure 1.** Different uses of a deictic expression.

In the case of deictic uses the demonstrative refers directly to the extra-linguistic physical context, and the utterance is probably accompanied by a pointing gesture. For non-deictic uses just the opposite holds. These uses are illustrated by (5)–(6) and (7)–(8) below:

- (5) Heb je dat book gelezen?  
 have you that-DEM.DIST.NEUT.SG book read  
 “Have you read *that* book?”
- (6) Ezt/Ezt a könyvet kérem.  
 this-DEM.PROX.ACC.SG. the book.ACC want  
 “I want *this*./I want *this* book.” (Laczkó 2008, 320–21)

- (7) Ja, az új Brown-regényről beszélsz?  
 Oh the new Brown-novel-about talk-PRESENT.2SG  
 “Oh, you are talking about the new Brown novel?”

*Azt* már olvastam.  
 that-DEM.DIST.SG already read-PAST.1SG  
 “I’ve already read *that*.”

- (8) Mark kwam Arthur tegen.  
 Mark come-PAST.3SG Arthur across  
 “Mark ran into Arthur.”

*Die* droeg een regenjas  
 that-DEM.DIST.SG wear-PAST.3SG a raincoat  
 “*That* one was wearing a raincoat.”

(Kaiser 2011, 1594; translation adjusted by Tóth et al.)

Within deictic cases, a further distinction can be made: gestural demonstratives are accompanied by a pointing gesture, while symbolic demonstratives are not. (See Levinson 2004; O’Keeffe et al. 2011.) Examples of gestural and symbolic uses of Hungarian and Dutch demonstratives are provided in (9)–(10) and (11)–(12), respectively.

- (9) *Az* a kutya pisilte le a bicajomat.  
 that-DEM.DIST.SG the dog pee on-PAST.3SG the my bike.ACC  
 “*That dog* has peed on my bike.”

- (10) *Ebben* a városban sok jó étterem van.  
 DEM.PROX.SG-in the city-in many good restaurant be  
 “There are many good restaurants *in this city*.”

- (11) *Dat* meisje draagt gele schoenen.  
 that-DEM.DIST.SG girl wear yellow shoe.PL  
 “*That girl* is wearing yellow shoes.”

- (12) *Dit* land heeft een goede regering nodig.  
 this-DEM.PROX.NEUT.SG country have a good government need  
 “*This country* needs a good government.”

According to Lyons (1977), a genuine case of deixis occurs when the deictic term is accompanied by some sort of extra-linguistic gesture. Accordingly, gestural uses of demonstratives constitute the scope of our study.

Levinson (2004) divides gestural uses into two subcategories: contrastive and non-contrastive uses. However, the present study extends the scope of contrastive and non-contrastive uses to linguistic contexts where contrastiveness is explicitly marked, e.g., by using adversative conjunctions or a sentence containing an identificational focus (see É. Kiss 1998 on identificational focus in English and Hungarian). In accordance with the well-known semantic function of identificational focus and relying on Chafe's (1994) definition of contrastiveness, we identify two main characteristics of contrastiveness for the time being:

- (i) contrastiveness involves “a selection of one candidate rather than another from an available set” (Chafe 1994, 77; see also Chafe 1976);
- (ii) contrastiveness as a conversational phenomenon often goes beyond turn boundaries.

We will provide a working definition of contrastive uses in Section 4.1. Example (13) below illustrates the notion that will be explicated later.

(13) *This garden hose is better than that one.*<sup>1</sup>

## 4. The Experiment

### 4.1 Background and Research Questions

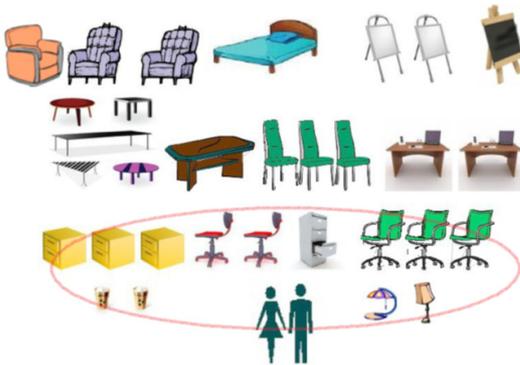
As mentioned earlier, traditional studies of deixis often explain the use of demonstratives in terms of relative distance from the speaker. Tóth (2014b) and the experiment reported here revisited the traditional view and tested the assumption that other cognitive factors may also play an essential role in the choice of gestural demonstratives in British English and in Dutch and Hungarian, respectively. As a starting point the following view of communication was considered. A crucial feature of deixis is that demonstratives serve to establish a joint focus of attention between the speaker and the hearer (Clark 1996, Diessel 2012), namely, that in order to communicate, the speaker and hearer must realize that their partner views the situation from a different perspective. Hence, throughout the communicative process, the perspective of the other person must be constantly adopted (see Clark and Bangerter 2004, Diessel 2006). Speakers may try to refer to a given object, and pointing serves as a means to help the addressee locate the referent, but a successful referring act requires a joint focus of attention from the speaker and addressee.

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1 *Wikipedia*, s.v. “Anaphora,” [http://en.wikipedia.org/wiki/Anaphora\\_%28linguistics%29](http://en.wikipedia.org/wiki/Anaphora_%28linguistics%29).

On the basis of these background assumptions, and adopting Luz and van der Sluis’s (2011) experimental methodology, a production study was carried out.<sup>2</sup> In neutral, i.e., non-contrastive contexts, the role of two factors—distance and accessibility—was explored. In order to investigate the contrastive/non-contrastive distinction (see Levinson 2004), the use of demonstratives in contrastive and neutral contexts was compared. The relevant notions will be defined as follows.

Distance as a factor is usually left unspecified in the relevant literature. This is not unexpected, since a precise definition of distance could be a function of several factors and the role of these factors may vary from situation to situation. For instance, if one can take an object into one’s hands (such as medium-sized articles for personal use or pets), then being an arm’s length away seems to be a natural criterion for defining distance. However, there are cases where this criterion obviously cannot be used; for instance, in the case of mountains seen from a window, islands on a map or planets in the sky it is more plausible to consider the path to be taken to “reach” these objects. Taking these considerations into account, only a working definition of distance is provided here. Relying on Kemmerer’s (1999) findings and Wilkins et al.’s (2007) guidelines, it can be stated that in a communicative setting which takes place in a room and where a joint focus of attention has been established, *near* space is more or less within arm’s reach and *far* space expands outward from that boundary.<sup>3</sup> Hence, we will treat entities that are located physically next to the speaker as being close (peripersonal), while everything else will be considered to be far (extrapersonal) in terms of the speaker’s point of view (see Figure 2).



**Figure 2.** Entities located close to the speaker in the furniture shop scenario.

<sup>2</sup> In the study described here perception issues were not considered.

<sup>3</sup> Coventry et al. (2008) showed that near space is extendable when a tool (a 70-cm stick) is used to point at the objects to be named.

Accessibility has been analyzed by a number of authors in discourse studies (see, for instance, Ariel 2001);<sup>4</sup> however, as Kahneman (2003) notes, there is no unique theoretical account of accessibility. Kahneman (2003) was the first to try to extend the scope of the notion to the physical level (see Piwek et al. 2008, 702). Relying on Kahneman's (2003) work, the notion of accessibility in extra-linguistic contexts that will be applied here is based on the entity's being in the focus of joint attention. Accessibility as a working notion will be defined as follows:

Accessibility:

- (i) an entity is associated with *low accessibility* if, according to the speaker's assessment, the addressee is invited to consider it to be new or unexpected, i.e., an effort is required on the part of the addressee to identify the referent;
- (ii) an entity is associated with *high accessibility* if it is already known to the addressee, i.e., it is in the focus of the joint attention of the speaker and the addressee.

Traditional pragmatic approaches usually define the notion of context with respect to four subcomponents. Following É. Kiss (1998; 2003) and Kaiser (2011), the last factor, contrastiveness, is defined with the following components:

Contrastiveness in:

- (i) physical context: no conditions;
- (ii) linguistic context: contrastiveness is explicitly indicated linguistically, for instance by using a coordinating conjunction with a contrastive sense, e.g., *but*, or a sentence containing an identificational focus or a contrastive topic;<sup>5</sup>
- (iii) epistemic context: the entities contrasted are highly accessible and compete to be highlighted in the joint focus of attention;
- (iv) social context: not relevant.

Contexts satisfying these conditions will be labeled as *contrastive*, while contexts that do not satisfy the definition above are to be treated as *neutral*. Thus, (13) above and the examples below are contrastive contexts. We provide a detailed description of the context only for the first example below.

Two men are sitting next to each other at a table in a café. There are three sandwiches (a ham sandwich and two cheese sandwiches) in the middle of the table, at an equal distance (and within arm's reach) from both men. The following mini-conversation takes place:

4 The notion of accessibility surfaces in different forms, such as givenness or familiarity in the relevant literature. For a recent summary see Birner (2013).

5 The linguistic context here is not restricted to a given conversational turn; it can exceed it (see Chafe (1976; 1994).

- (14) Melyik szendvicset kéred? A sonkásat? (rámutat)  
 which sandwich-ACC want-PRES.2SG the ham sandwich-ACC  
 “Which sandwich would you like? The ham sandwich?” (pointing at it)

Szeretem a sonkás szendvicset, de most  
 like-PRES.1SG ham sandwich-ACC but now

inkább *ezt/azt a sajtosat* kérem. (rámutat)  
 rather take-PRES.2SG this/that cheese sandwich-ACC  
 “I like ham sandwiches, but now I’d rather take *this/that cheese sandwich*.”  
 (pointing at it)

- (15) Ik vind *deze* *tafel* mooi,  
 I find- PRES.1SG this- DIST.FEM.SG table nice  
 maar *die* is lelijk.  
 but that-DEM.PROX.FEM.SG be-PRES.3SG ugly  
 “I find *this table* nice, but *that one* is ugly.”

- (16) *Ezt* *a dobozt* vidd le a pincébe  
 this- DEM.PROX.ACC.SG the box-ACC take-IMP.2SG down the cellar-into  
*azt* viszont hagyd a helyén  
 that-DEM.DIST.ACC.SG but leave-IMP.2SG the place-Poss.3SG-on  
 “Take *this box* down to the cellar, but leave *that one* where it is.”  
 (Laczkó 2012, 296)

Relying on the factors defined above, in neutral contexts two hypotheses were to be tested:

*Hypothesis 1 (distance)*

In neutral (i.e., non-contrastive) contexts, gestural proximal demonstratives are selected by speakers to refer to entities that are close to the speaker, while gestural distal demonstratives are preferred by speakers to refer to entities that are further away.

*Hypothesis 2 (accessibility)*

In neutral (i.e., non-contrastive) contexts, gestural proximal demonstratives are selected by speakers to refer to entities that are associated with low accessibility, while gestural distal demonstratives are selected to refer to entities associated with high accessibility (see Piwek et al. 2008, 710; Strauss 2002, 135).

Turning to contrastive contexts, we wanted to examine whether the nature of the context influences the choice of gestural demonstratives or not. In contrastive contexts

the referents are competing to be highlighted. For this reason, we expected that in contrastive contexts, when the distance is constant (near), the frequency of the demonstratives selected will change. Contexts where the entities being talked about are far from the speaker could not be tested by this method, since all factors would trigger the choice of distals.<sup>6</sup> Hence, the third hypothesis concerning the choice of demonstratives in neutral vs. contrastive contexts is the following:

*Hypothesis 3 (contrastiveness)*

The pattern of gestural demonstratives selected is different in neutral and in contrastive contexts.

According to the principle of falsification, during the statistical analysis our null hypothesis is that the distribution of demonstratives is the same in the contexts in question.

In order to test these hypotheses we carried out the experiment reported below.

## 4.2 Materials and Methods

There were 37 Hungarian (H) and 48 Dutch (D) participants in the experiment, all adult native speakers, with an average age of H: 23 and D: 31, respectively. The subjects were randomly selected; there were H: 20 male, 17 female; D: 22 male and 26 female subjects. We adopted Luz and Van der Sluis's (2011) experimental method. The participants read a scripted dialogue in a furniture shop setting between the shop assistant (female) and a buyer (male). Their task was to choose between different demonstrative expressions<sup>7</sup> in a multiple-choice online test. The layout of the furniture shop is represented in Figure 2 above (obviously, the oval was removed), and the picture was visible throughout the test.

The dialogue consisted of 18 questions:

- 4-4 questions tested the distance hypothesis (accessibility was equally distributed): 1/8/11/14 and 3/6/15/17;
- 4-4 questions tested the accessibility hypothesis (distance was equally distributed): 3/8/11/17 and 1/6/14/15;

<sup>6</sup> Those cases where one of the entities is near and the other is far cannot be tested in this framework, either. Consider the example below:

(i) *This one* (here) is bigger than *that one* (over there). (Diessel 2012, 2419)

<sup>7</sup> In each case a pointing gesture on the part of the speaker was assumed; this was always indicated in the text. The Hungarian test is available at the link below:

[https://docs.google.com/forms/d/1d7xjw6yoWzw3fqGHCyrbv38qiS7fa9AgHN1\\_fu6DDdc/viewform](https://docs.google.com/forms/d/1d7xjw6yoWzw3fqGHCyrbv38qiS7fa9AgHN1_fu6DDdc/viewform)

The Dutch test is available at the link below:

<https://docs.google.com/forms/d/1hzzhtzX-r44obgnmlBcUcbyPtKiCb-C2LRTIVuef0s0/viewform>

- 4-4 questions tested contrastive and non-contrastive contexts (distance: near, accessibility: high): 2/9/10/13 and 1/8/11/14;
- six questions served as fillers: 4/5/7/12/16/18.

The furniture shop scenario contained 31 objects; five of these were distractors. Objects considered to be near and far were equal in number.

An example from the test is presented below (Question 6):

(17) H: Vevő: Kérek még ... (rámutat). Írjon fel belőle hatot.

- abból a barna íróasztalból
- ebből a barna íróasztalból

D: Klant: Ik wil ook nog zes .... bestellen. (De klant wijst naar de bureaus.)

- van die bruine bureaus
- van deze bruine bureaus

“Buyer: I’ll also buy some of ... (he is pointing at the desks). Add six to your list.

- those brown desks
- these brown desks”

### 4.3 Results

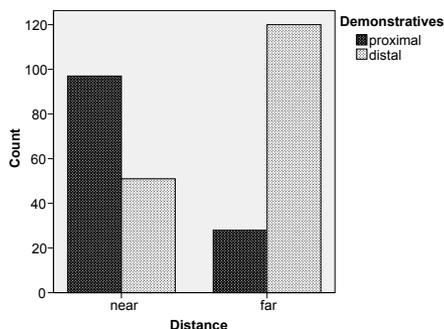
The results of the test and the predictions of the individual hypotheses are shown in Table 1.

| Questions | Dutch |       | Hungarian |       | Expectations |       |       |
|-----------|-------|-------|-----------|-------|--------------|-------|-------|
|           | Prox. | Dist. | Prox.     | Dist. | H1           | H2    | H3    |
| 1         | 25    | 23    | 24        | 13    | prox.        | prox. | –     |
| 2         | 11    | 37    | 14        | 23    | prox.        | dist. | dist. |
| 3         | 13    | 35    | 10        | 27    | dist.        | dist. | –     |
| 6         | 7     | 41    | 3         | 34    | dist.        | prox. | –     |
| 8         | 34    | 14    | 29        | 8     | prox.        | dist. | –     |
| 9         | 13    | 35    | 15        | 22    | prox.        | dist. | dist. |
| 10        | 23    | 25    | 19        | 18    | prox.        | dist. | dist. |
| 11        | 14    | 34    | 17        | 20    | prox.        | dist. | –     |
| 13        | 17    | 31    | 19        | 18    | prox.        | dist. | dist. |
| 14        | 34    | 14    | 27        | 10    | prox.        | prox. | –     |
| 15        | 6     | 42    | 7         | 30    | dist.        | prox. | –     |
| 17        | 9     | 39    | 8         | 29    | dist.        | dist. | –     |

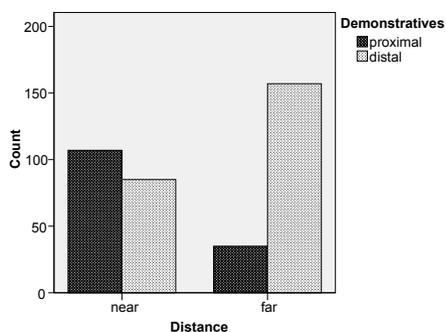
**Table 1.** Results.

The data were analyzed using chi-square statistics. Regarding distance, in neutral contexts there is a significant difference between near and far objects and the choice of demonstratives (proximal vs. distal), and hence the first hypothesis is accepted. ( $\chi^2(1) = H: 65.93, D: 57.929, p < 0.01$ ) The distribution of gestural demonstratives with respect to distance is shown in Figure 3. Taking into consideration accessibility in neutral contexts, there is no significant difference; thus, the accessibility hypothesis is rejected. ( $\chi^2(1) = H: 0.125, D: 0.045, p > 0.05$ )

H:

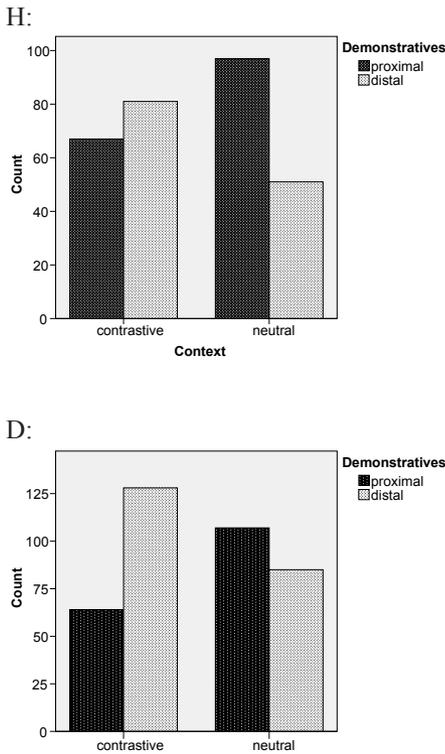


D:



**Figure 3.** Distribution of gestural demonstratives over distance in neutral contexts.

Finally, the choice of gestural demonstratives in neutral and contrastive contexts was compared (for details see the descriptions of the questions above). Using the chi-square test again, it was shown that there is a significant difference between the choice of proximals and distals, depending on the nature of the context ( $\chi^2(1) = H: 12.306, D: 19.499, p < 0.01$ ), and hence, there is a relationship between the choice of gestural proximals and distals and the type of context (see Figure 4).



**Figure 4.** Distribution of gestural demonstratives in neutral and contrastive contexts.

## 5. Discussion

On the basis of the results of the experiment above, it seems to be the case that in neutral contexts distance is indeed an important factor; Hypothesis 1 (distance) adequately captures the choice of demonstratives in Hungarian and Dutch in neutral contexts. These findings agree with Luz and Van der Sluis's (2011) results concerning English, Dutch, and Portuguese in a similar experimental setting and with Coventry et al.'s (2008) results for English and Spanish in a different setting. Although several studies have criticized distance and tried to replace it as a decisive factor, the experiment reported here, like many other experiments cited in the literature, reinforces the basic role of distance. A closer look at Figure 3 reveals an interesting phenomenon; when the entity being referred to is close to the speaker, the number of proximal and distal demonstratives selected is quite close in Dutch. Moreover, if we examine the relevant questions, it turns out that in the case of question 11 even more distals are selected in neutral contexts, though the entities are close to the speaker. These data, then,

seemingly contradict Hypothesis 1 (distance). Levinson (2004) argues that the choice of *this* always indicates some kind of proximity, but *that* is semantically unmarked with respect to distance. Diessel (2012) even argues that “in non-contrastive situations *this* and *that* are often interchangeable . . . , suggesting that they do not carry an inherent distance feature” (Diessel 2012, 2419). Those questions where the entities were far from the speaker yielded more uniform results; in each case more distals than proximals were selected (questions 3, 6, 15, and 17). Hence, the role of distance as a decisive factor is more convincing in those cases where the entities being talked about are far from the speaker.<sup>8</sup> Those cases where the entities are close to the speaker will be discussed in a more detailed fashion later on.

Hypothesis 2 (accessibility) is rejected in both languages, i.e., the choice of gestural proximals versus gestural distals is not dependent upon accessibility in neutral contexts. One of the authors of this article has shown in a different experimental setting that accessibility does not influence the choice of demonstratives in Hungarian (Tóth 2013; 2014a). This outcome has been reinforced by the present experiment. Hence, accessibility seems to be a weak factor, if it is a factor at all; it cannot explain the use of gestural demonstratives in neutral contexts in Hungarian and Dutch. The weakness of accessibility may be represented by the results obtained for question 8, which are quite similar in proportion (H: 29 proximals, 8 distals; D: 34 proximals, 14 distals). Here a clash between distance and accessibility can be observed; if accessibility was a strong factor it would override distance or at least compete with it, and more distals would be selected.

The results concerning accessibility in the literature are controversial: Piwek et al. (2008) accepts the same hypothesis for Dutch in a controlled dialogue game setting, while Jarbou (2010) argues that in spoken Arabic just the opposite holds (his results are based on observations of naturally occurring speech). Many authors note that the notion of accessibility is not well defined (see Burenhult 2003, Hanks 2009). Hence, further studies may be required that are based on a more exact notion of accessibility, at least in an experimental framework.

Turning to our final hypothesis, we have shown that in contrastive contexts the pattern of demonstratives is indeed different from that observed in neutral contexts. In neutral contexts, the set of entities, i.e., the possible referents of demonstratives, is relatively unlimited, and the choice of demonstratives seems to depend on the dimension of relative distance from the speaker in the default case (see Hypothesis 1). As opposed to that, in contrastive contexts the set of possible referents is much more limited; in most cases there are only two entities that may be referred to and these are competing to be

8 A similar pattern was found for English by Tóth (2014b). These results suggest that in English and Dutch, which are Germanic languages, distance seems not to be as strong as it is in Hungarian, a Finno-Ugric language. Further experiments and new data sources (Finnish, Estonian) are needed to test this assumption.

highlighted. Our results proved that there is a significant difference between neutral and contrastive contexts. Keeping in mind the fact that accessibility was rejected as a crucial factor in neutral contexts, there must be another factor that is responsible for the higher number of distal demonstratives chosen in contexts where distance is constant, i.e., close to the speaker. Hence, there must be a factor that interacts and competes with distance in contrastive contexts. It is left for future research to explore and test for such a possible factor.

We think that contrastiveness may act as a trigger for activating or reinterpreting other factors. First, distance may still be a crucial factor, but only within the proximal dimension. More specifically, since the entities are close to the speaker, being within arm's reach is no longer relevant; instead, immediateness becomes prominent. This means that distance is still important, but the space around the speaker, in which the entities are situated, is rescaled. In accordance with that the near-far distinction also has to be modified within this rescaled space. Second, other factors, such as the speaker's emotions towards the entities being referred to (for instance, fear, disgust, like or dislike) may also play a role. Moreover, the familiarity or salience of the entities, which depends on the speaker's background knowledge, might also be important.

Contrastive contexts are frequently mentioned in the relevant literature on deixis, as illustrated by the examples cited below (18)–(21). However, to the best of our knowledge such contexts have never been compared to neutral contexts and they have not been examined in an experimental framework before.

(18) (Pointing at two sample plates in a china shop): *These* are over at the warehouse, but *those* I have in stock here. (Wolter 2009, 454)

(19) *This speck* is smaller than *that speck*. (Talmy 2000, 25)

(20) *This planet* is smaller than *that planet*. (Talmy 2000, 25)

|  |               |                      |
|--|---------------|----------------------|
| (21) <i>Ezt</i>  | kérem,        | <i>az</i>            |
| this-DEM.PROX.ACC.SG   | want-PRES.1SG | that-DEM.DIST.NOM.SG |
| pedig  | maradjon      | a helyén.            |
| but  | stay-IMP.3SG  | the be-POSS.3SG-on   |
| ‘‘I want <i>this</i> , but <i>that one</i> should stay there.’’ (Laczkó 2008, 326) |               |                      |

It was Levinson (2004) who introduced the contrastive–non-contrastive distinction within the category of gestural uses when he pointed out that the use of demonstratives may bring into existence a new focus of attention or signal a contrast between two referents that have been introduced into the conversation earlier (consider example [21]).

Fortis and Fagard (2010) note that relative distance is not only a matter of physical proximity (see the difference between examples [22] and [23] above). Hence, further studies are required to explore the relationship and interplay between distance and the nature of the context as factors influencing the choice of gestural demonstratives.

## 6. Conclusions

The experimental data seem to be helpful in differentiating and specifying the factors influencing the choice of gestural demonstratives in Hungarian and Dutch in different contexts. It must be noted here that the same results regarding the individual hypotheses have been obtained in an identical experimental setting for British English (see Tóth 2014b). The results shed new light on the factors determining the choice of demonstratives. We found a significant difference between the choice of demonstratives, depending on the nature of the context (neutral vs. contrastive). In neutral contexts, distance plays a crucial role in both Hungarian and Dutch, while accessibility as a determining factor was ruled out. It seems to be the case, though, that distance is more prominent in neutral contexts in Hungarian. In the case of contrastive contexts, where the entities referred to are highly accessible and close to the speaker, the results are more uniform; the pattern of demonstratives changed significantly in both languages, i.e., distals were preferred. We conclude that there is a significant difference between neutral and contrastive contexts, and as mentioned above, further studies are called for to test the factors determining the use of demonstratives in contrastive contexts.

It is clear that experimental studies make a valuable contribution to current cross-linguistic research on demonstratives. However, further experiments are needed. It is left for future research to explore and test for the possible factor(s) involved in contrastiveness, to explore languages that fall into different typological categories (languages with a three-term demonstrative system could be especially interesting) and to examine other uses of demonstratives (such as symbolic and non-deictic uses). Further experiments are called for to explore other potential factors (e.g., salience) and it is also important to keep in mind that since the factors might not be independent of each other, it is also necessary to examine the interrelationships among the relevant factors and to compare the results within a contrastive linguistic framework.

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# VoLIP: A Searchable Corpus of Spoken Italian

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**Abstract:** VoLIP is a linguistic resource, freely available on the portal [www.parlaritaliano.it](http://www.parlaritaliano.it), which gives parallel access to the acoustic and textual information contained in a corpus of spontaneous spoken Italian texts. The corpus is searchable for a) textual and register variables, as annotated in a metadata IMDI format (Broeder et al. 2001; [www.mpi.nl/imdi/](http://www.mpi.nl/imdi/)) and b) lexical and morpho-syntactic criteria. The two kinds of queries can be cross-checked. All the queries produce orthographic transcriptions aligned with audio files. The corpus consists of about 500,000 word tokens for 60 hours of recordings, collected in four different Italian cities (Milan, Florence, Rome, and Naples) and in five different diaphasic situations (face-to-face conversations; telephone conversations; interviews, debates, and classroom interactions; lectures, sermons, and speeches; radio and television programmes). While the number of samples is variable, the corpus presents a balanced total number of words per city, as well as per diaphasic situation.

**Keywords:** Italian; spoken corpora; text-to-speech alignment; lexicon; sociolinguistics

## 1. Introduction

The study of spoken language in Italy has been closely intertwined with the study of the sociolinguistic dynamics among different diatopic and diaphasic varieties. Since the 16th century, a condition of diglossia has prevailed in Italy as a result of the presence of “High” and “Low” varieties, corresponding respectively to literary Italian, used almost exclusively in writing, and local dialects, used in speech. It is worth recalling that what are called dialects do not derive from Italian, nor are they varieties or adaptations of

the national language. On the contrary, Italian, along with all the other Italo-Romance dialects, such as Turinese, Milanese, Neapolitan, etc., are all “sister” languages derived from spoken Latin, and they not only differ significantly from each other but are also reciprocally unintelligible in some cases, such as Italian and French.

Dialects were the common means of spoken communication, with a local regional variety often being preferred to literary Italian when writing daily or administrative correspondence. This situation persisted for centuries, although after the Unification of the country (1861), Italian began to improve its position (De Mauro 1972).

However, it is worth noting, probably against initial expectations, how dialects have not completely disappeared and nowadays there is an increase in the number of, on the one hand, native speakers of Italian and, on the other, of bilingual speakers of Italian and Italo-Romance dialects. In fact, there is a large portion of Italians who are bilingual (around 32%: Voghera 2005; ISTAT 2007), whereas before Italy was effectively a monolingual country, consisting mainly of dialect speakers.

The spread of the use of Italian in both speaking and writing and the persistence of dialects have naturally given rise to regional varieties of Italian with dialectal influences on different levels of linguistic structures. This produces, mainly in spoken communication, a new level of variation that overlaps with, but is partially independent from, that of the original dialects (Berruto 2012).

Thus, the study of spoken Italian and its registers entails the need to consider the role of the relationship between the diatopic and diaphasic dimensions as a central issue. Consequently, a representative description of spoken Italian must start from the consideration of a balanced collection of texts, according to registers and regional variables.

## **2. The Website *Parlaritaliano.it***

The VoLIP corpus (*Voce del LIP*), presented here, is a single piece in the puzzle of a long-term program to build a general observatory of spoken Italian. It started in 2004 with a joint project, promoted by several different Italian research groups coordinated by the University of Salerno. All the material and results obtained during the initial project and the subsequent developments, mainly produced by the researchers from the University of Salerno and the University of Naples “Federico II,” can be consulted at the portal [www.parlaritaliano.it](http://www.parlaritaliano.it).

The observatory has two closely related objectives (Voghera 2010). The first is to extend the cognitive basis of the performance and grammatical mechanisms of spoken communication through research based on corpora. Spoken language is still relatively underrepresented within corpus linguistics and, particularly, in Romance linguistics (Cresti and Moneglia 2005; O’Keeffe and McCarthy 2010; McEneary and Hardie 2012). Regarding Italian, although great efforts have been made in recent decades (Cresti and Moneglia 2005; Savy and Cutugno 2009; Baroni 2010; Cresti and Panunzi 2013),

there is still a limited number of spontaneous spoken language corpora, with a limited range of diaphasic or diatopic variation. Moreover, most of them either offer only orthographic transcriptions or give limited access to the audio files (Lüdeling and Kytö 2008). This significantly restricts not only any phonetic and phonological investigations but also the possibility of capturing the multidimensional nature of the meaning construction in spoken discourse. In fact, most of the syntactic phrasing, syntactic relations (coordination, subordination, juxtaposition), information structure, and sentence mood or modality can be triggered by specific prosodic forms. Therefore both prosody and the interfaces between prosody and other levels of text are an integral part of grammar, while also necessary for the linguistic analysis of spoken language.

The second objective of the observatory involves evaluating how and how much the extending of linguistic data might contribute to a better understanding of the linguistic system in its entirety. In fact, it is evident that speech, at an initial level, is characterized by a sub-group of typical language structures that are not (or only partially) observable in other contexts; at a second level, speech makes it possible to discover the relationships between different portions of grammar which are otherwise hidden, but nonetheless central to the general architecture of the system.

Computational goals aimed at studying the structure of metadata, linguistic databases, analysis, and implementation are added to the strictly linguistic objectives of the observatory. The portal includes research on the theoretical and practical implementation of techniques for the automatic segmentation of audio and video signals, with specific attention to their use in the management of multimedia and multimodal linguistic corpora.

There are various research fields in the project, covering numerous aspects that relate to speech and spoken communication: from the history of studies on speech, to research regarding diachronic, regional, and diaphasic registers, as well as the differences between native and non-native speech, from the contributions of computational linguistics to experiments in the technological field on the analysis and management of speech data. Even though quite extensive, the list should not be considered exhaustive or complete, but rather open to further developments and improvement.

### **3. VoLIP**

VoLIP was developed within the frame of the observatory on spoken Italian, with it being a linguistic resource which gives parallel access to the acoustic and textual information contained in a corpus of texts in spontaneous spoken Italian. It allows for two kinds of queries in terms of: a) textual and register variables and b) lexical and morpho-syntactic criteria. The two queries can be simultaneous.

VoLIP matches the audio signal files with the orthographic transcriptions of the samples of the LIP Corpus (De Mauro et al. 1993), collected in the early 1990s to compile a frequency lexicon of spoken Italian. Its size was tailored to produce a reliable

frequency lexicon for the first 3,000 lemmas and therefore, consists of about 500,000 word tokens for 60 hours of recording. The corpus represents diaphasic, diatopic, and diamesic variations. The texts are divided into five groups with a decreasing degree of dialogue and an increasing level of formality, as reported in Table 1: A) face-to-face conversations; B) telephone conversations; C) bidirectional communicative exchanges with constrained turn-taking alternation, such as interviews, debates, classroom interactions, oral exams, etc.; D) monologues, such as lectures, sermons, speeches, etc.; E) radio and television programs. The texts in groups A and B belong to both formal and informal registers, while those in C, D, and E were mainly recorded in public contexts, which select formal registers. Regarding the diatopic variations, the texts were collected in Milan, Rome, Naples, and Florence. The first three cities were chosen because of both their geographical position and the number of inhabitants, since Rome, Naples, and Milan are the most populated Italian cities. Florence was chosen because of its role in Italian linguistic history. Italy's national language originates as a written language based on the literate Florentine of the 14th century, codified at the beginning of the 16th century. Notwithstanding the number of samples being variable, the corpus presents a balanced total number of words per city and per diaphasic situation, as reported in Table 1.

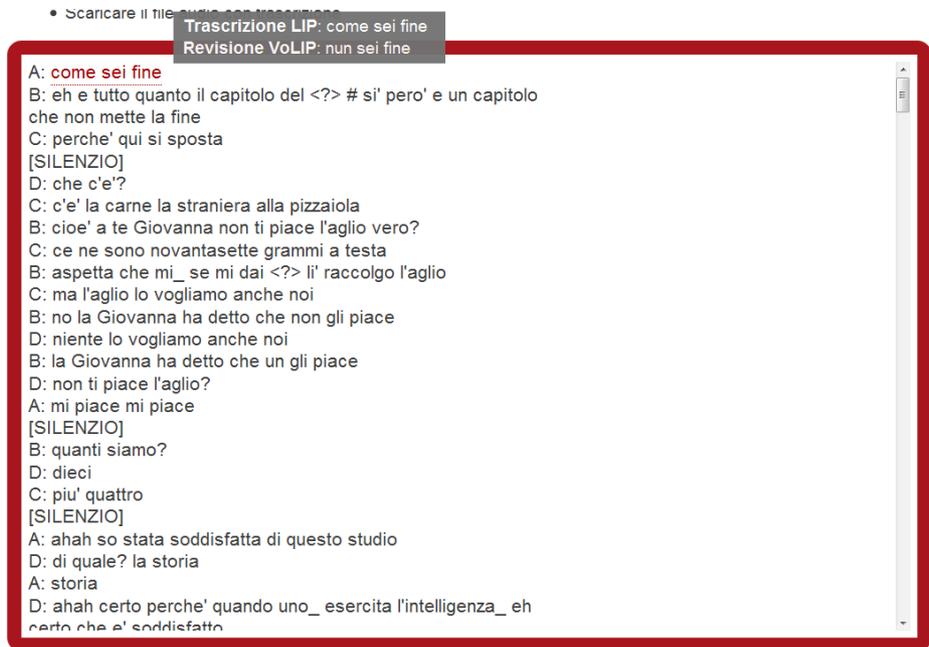
|                                   | Milan    | Florence | Rome     | Naples   | Total    |
|-----------------------------------|----------|----------|----------|----------|----------|
| <b>Face-to-face conversations</b> | ~25,000  | ~25,000  | ~25,000  | ~25,000  | ~100,000 |
| <b>Telephone conversations</b>    | ~25,000  | ~25,000  | ~25,000  | ~25,000  | ~100,000 |
| <b>Interviews, debates</b>        | ~25,000  | ~25,000  | ~25,000  | ~25,000  | ~100,000 |
| <b>Monologues</b>                 | ~25,000  | ~25,000  | ~25,000  | ~25,000  | ~100,000 |
| <b>Radio/TV</b>                   | ~25,000  | ~25,000  | ~25,000  | ~25,000  | ~100,000 |
| <b>Total</b>                      | ~125,000 | ~125,000 | ~125,000 | ~125,000 | ~500,000 |

**Table 1.** Design of the VoLIP corpus.

VoLIP was created within an ecological perspective of linguistic resources, with the aim being to fully use and build up, where possible, resources that are readily available, but underutilized for various reasons. Although the original transcriptions of the texts of the LIP have already been published along with the frequency lexicon (De Mauro et al. 1993) and were queryable thanks to a team from the University of Graz (badip.uni-graz.at), the audio files were neither available nor queryable. VoLIP has therefore improved the use of the resources by providing the scientific community with new use features that did not previously exist, while also offering free and direct access to the entire corpus on the website: [www.parlaritaliano.it](http://www.parlaritaliano.it).

### 3.1 Text-to-Speech Alignment

VoLIP provides the audio files of all the samples of the LIP corpus in wav files (Windows PCM, 22050 Hz. 16 bit). The process of accessing the original recordings and matching the audio files with the transcriptions was very delicate. The original analog LIP recordings were transferred onto DAT tape and then digitalized in 1993. To create VoLIP, the DAT tapes were converted into wav and mp3 files, with the audio then being double-checked through a comparison with the original transcriptions and any oversights and errors made in the original transcriptions being corrected. Since most of the former linguistic computations and statistics were based on the original transcriptions, both versions were made available. When there is a reformulated transcription, the text appears in bold red font: if the mouse is positioned on that part of the text, a pop-up window containing the revised transcription appears.



**Figure 1.** Output of orthographic revision.

Since not all the original recordings were made under optimal conditions, two techniques were applied to the corpus in order to automatically align the speech and the text. For the material whose audio quality was above a minimum threshold of acceptability, traditional techniques were used for the forced alignment typically used in Automatic Speech Recognition procedures, with some useful specific corrections

for the work conditions. It was not possible to use the forced alignment technique in about 35 per cent of the digitized recordings because of the speech quality. In this case, some scripts were written in such a way as to ease the manual subdivision into blocks of a few seconds: an operator listened to the audio files while visually following the transcription on the monitor. Every time the listener decided (within an approximate span of about two seconds) to add a time marker to the text by pressing the space bar, the system consequently produced an approximately two-second-long block of speech.

The segmentation is then twofold; in some cases it works at word-level granularity and, in other cases, in two-second blocks. This choice is compatible with the aims since the results of both strategies allow the web service to address (or to download) the audio chunks within which the required portion of text (usually one or two words) is systematically included.

### 3.2 Search for Metadata

VoLIP can be searched according to two sets of metadata: the original one, used for the LIP corpus, and a new one, according to the IMDI standards (Broeder et al. 2001; [www.mpi.nl/imdi/](http://www.mpi.nl/imdi/)).

The box *Town* allows the geographical origin of the speakers to be selected (from the four cities Florence, Milan, Naples, and Rome), while the *Lip* section refers to discourse genres of the cataloguing adopted in LIP (Table 2).

| LIP groups | Text Types                                  | Speech Flow           | Constrained turn-taking | Face-to-face |
|------------|---|-----------------------|-------------------------|--------------|
| A          | Face-to face conversations                  | bidirectional         | –                       | +            |
| B          | Telephone conversations                     | bidirectional         | –                       | –            |
| C          | Interviews, debates, classroom interactions | bi-/multidirectional  | +                       | +            |
| D          | Lectures, sermons, speeches                 | unidirectional        | +                       | +            |
| E          | Radio and TV programs                       | uni-/multidirectional | ±                       | ±            |

**Table 2.** Original set of diaphasic variables.

The other items in Figure 2 correspond to IMDI metadata fields.

|                                  |                                   |                                    |
|----------------------------------|-----------------------------------|------------------------------------|
| Town:<br>All                     | LIP Section:<br>Selezionare...    | Actors' sex:<br>Both               |
| Genre:<br>Selezionare...         | SubGenre:<br>Selezionare...       | Interactivity:<br>Selezionare...   |
| Planning Type:<br>Selezionare... | Social Context:<br>Selezionare... | Event Structure:<br>Selezionare... |
| Channel:<br>Selezionare...       |                                   |                                    |

Reset Submit

**Figure 2.** Set of VoLIP metadata.

The box *Actors' sex* allows male or female voices to be filtered. *Genre* corresponds to the first macro-cataloguing of broadcasting speech (*Radio/TV feature*) and all other types (*Discourse*). For each of the two, it is then possible, using the field *SubGenre*, to select a specific subtype: in *Radio/TV feature*, it is possible, for example, to select radio interviews and television news; in *Discourse*, it is possible to search for school or university lessons. The other fields are related to the degree of interactivity (*Interactivity*) and planning of the text (*Planning type*), the context in which the communicative exchange occurs (*Social Context*), the structure of the event relative to the number of participants (*Event Structure*), and the type of transmission channel (*Channel*).

The possibility of crossing several selections allows multiple detailed aspects to be searched for simultaneously.

### 3.3 Search for Lemma or Form

The lexical and morpho-syntactic search results in all the texts present the requested item (word form or lemma), which is provided with the frequency of occurrence per city and per register.

In the search for lemmas, it is possible to select a specific part of speech, including those on which the lemmatization of the LIP is based (*Adjective, Adverb, Article, Company Name, Conjunction, Geographic Name, Interjection, Name, Noun, Onomatopoeia, Preposition, Pronoun, Surname, Verb*), as well as to select them all (see Figure 3). Both the query for lemmas and that for forms provide the opportunity to refine the search by selecting either one of the five distinct discourse genres in the LIP or the entire set (Table 2).



Figure 3. Search for a part of speech.

Upon typing the word searched for in the “Lemma” box, it is possible to choose between two options, “Count” and “List,” which allows the research to be directed in two directions. “Count” gives both the total number of occurrences of the lemma and their distribution in the five genres of the LIP (see Figure 4).



Figure 4. List of the forms of the lemma *correre* (“to run”) with their frequency.<sup>1</sup>

The choice of the “List” option gives a list of the forms of a given lemma, together with their distribution divided into the five LIP discourse genres.

An example of a search that aims to identify the audio signal of the contexts in which the form *corre* (“she/he runs”) is given below (Figure 5).

<sup>1</sup> The symbol @ represents the local or dialectal forms.

The search for the form *corre* (“(she/he) runs”), in the example presented in Figure 5, results in the total number of occurrences of the form and their distribution in the five genres, as well as a list of files (audio and transcripts) in which the item appears.



Figure 5. Frequency of the form *corre*.

It is possible to download the entire file, either as a text or audio file, as well as quickly to identify the various occurrences of the form.

The orthographic form is displayed in yellow and by clicking on the form, it is possible to listen to the context in which it appears, thanks to the alignment between the transcript and audio. In addition to listening to the context, it is possible to download the audio file fragment or the entire file or proceed with a search for the form within the file (see Figure 6).

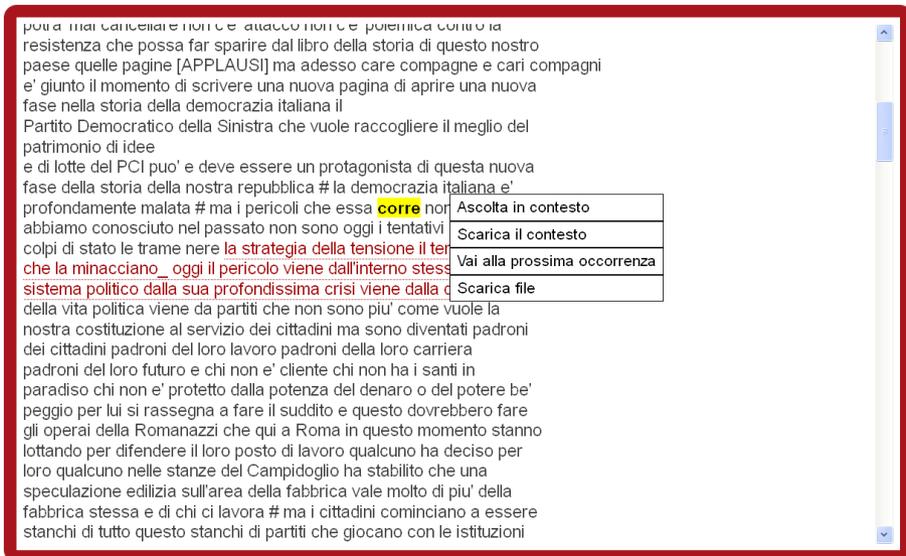


Figure 6. Requested form and audio.

It is also possible to refine the search through the crossing of the parameters of the criteria briefly described, for example, obtaining information on a given form, distinguishing between the occurrences in relation to the parts of speech to which it can be traced. A typical example is the resolution of the homographs of the first-person singular present indicative of the verb *amare* (“to love”) and the singular noun *amo* (“hook”) (see Figure 7).

| PoS  | Lemma | Form | A | B | C | D | E | Total |
|------|-------|------|---|---|---|---|---|-------|
| Verb | AMARE | amo  | 0 | 3 | 0 | 0 | 0 | 3     |
| Noun | AMO   | amo  | 0 | 0 | 0 | 0 | 1 | 1     |

**Figure 7.** Disambiguation of homographs.

Upon identifying the form belonging to the desired part of speech, it is possible to watch and listen to the contexts of its occurrence.

It is also possible to search for word form sequences, for example, *ho dormito* “(I) slept,” *i cani* “the dogs,” or *è una città che* “is a town that,” with the output being both the transcription and the audio file. The search for sequences makes it possible to identify contexts that could be useful not only for segmental and suprasegmental phonetic and phonological analyses but also for the study of the relationship between the phonic form and the semantic and syntactic levels, with it being a crucial aspect of any investigation of speech.

#### 4. Using VoLIP for Sociophonetic Comparison

Despite the significant development of corpus linguistics over the last few decades, the number of speech corpora is still very limited. It is worth considering that in the *British National Corpus*, as well as the *Corpus de Referencia del Español Actual*, two of the most important projects in the construction of national reference corpora, the relationship between spoken and written texts is one to ten. This shows how speech is under-represented even when it comes to languages that have an intercontinental diffusion.

The situation is no different, of course, for Italian. While a number of initiatives for the collection of written corpora have been developed in recent years, the number of speech corpora currently available is still relatively low (Cresti and Moneglia 2005; Savy and Cutugno 2009; Baroni 2010). There are even fewer that give free access to online audio materials (Savy and Cutugno 2009). This is also why VoLIP is an important resource that integrates various search opportunities, both in metadata as well as within the corpus.

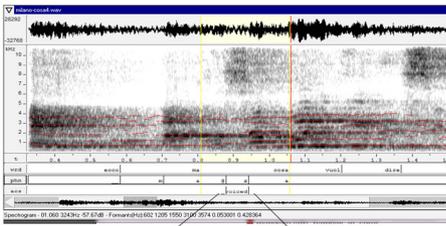
The search for forms, lemmas, and comparable contexts is enhanced by the simultaneous access to the audio files. Even if VoLIP was not conceived on a technical-methodological level for phonetic research, its layered structure allows the corpus to be used as a control or “verification” for socio-phonetic analyses carried out on other materials (laboratory speech, special corpora, semi-spontaneous elicited or read speech), with respect to which VoLIP undoubtedly has the advantage of decidedly spontaneous speech from all points of view.

The use of the audio files may be limited, of course, to merely listening to an auditory verification of variation hypotheses. However, the possibility of downloading short parts of the audio file gives further signal processing opportunities, through specific instrumental phonetic analysis programs (“external” to the website), to support the sociolinguistic or socio-phonetic hypothesis.

For example, we can compare the analysis of the four diatopic varieties under consideration by querying the forms of the word *cosa* (see Figure 8). The lexical example highlights two diatopic phonetic variations:

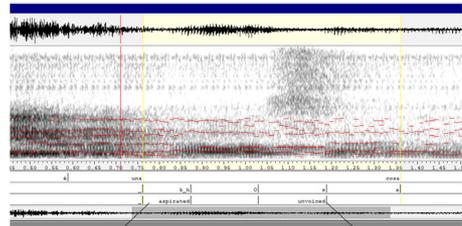
1. The realization of the occlusive unvoiced /k/ phoneme which may be subject to forms of lenition (until canceled) in the southern varieties, while it is the subject of a well-known aspiration phenomenon (or spirantization, the so-called “*gorgia*”) in the Tuscan variety (Florence).
2. The different distribution of the phonemes /s/-/z/ in intervocalic position (tend to [z] in the northern varieties, [s] in the south, swinging, lexically or morpho-phonologically conditioned, in the Tuscan varieties).

a) Milan



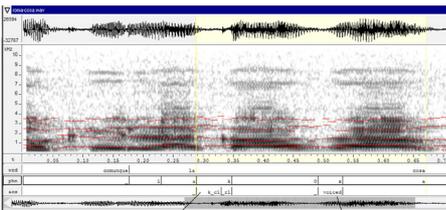
Cancelled segment /k/ [k̠za] Voiced segment /z/

b) Florence



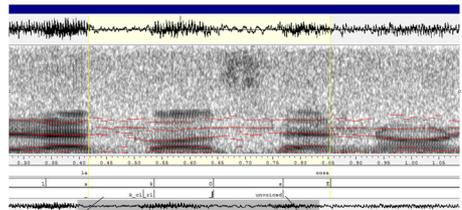
Aspirated segment /k/ [k̠hosa] Unvoiced segment /s/

c) Rome



Plosive segment /k/ [k̠za] Voiced segment /z/

d) Naples



Aspirated segment /k/ [k̠se] Unvoiced segment /s/

**Figure 8.** Spectral analysis of the acoustic-phonetic realizations of the word *cosa* (oscillating between a “traditional”–etymologic form /k̠o:sa/ and a “neutral”–modern form /k̠o:za/, cf. Canepari 1999, 120–21).

The possibility of carrying out sociolinguistic comparisons of spontaneous material is also a valuable resource for the teaching of Italian both as a first and second language. The endogenous linguistic variability discussed in the introduction has an added variability caused by the languages of new immigrants (Valentini 2005). This gives rise to the urgent need for realistic pedagogical grammar models that are capable of communicating in a multilingual context in order to meet the real communication needs of new generations and new Italians. Thus, speech can no longer be on the edge of language pedagogy but at the center.

## 5. Conclusions

Thanks to the descriptive efforts of the last decades (De Mauro et al. 1993; De Mauro 1994; Cresti and Moneglia 2005; Albano Leoni and Giordano 2005; Savy and Cutugno 2009), we have a better knowledge of the most typical and frequent features of spoken Italian. Following this important investigation period, which had principally documentary objectives, a new stage is possible, aiming at the construction of a systematic framework within which both speech phenomena (such as disfluencies, repairs, etc.) and spoken structures can be explained.

In order to reach this objective, it is necessary not only to look at the type and frequency of various spoken constructions, but to find their reason and specificity. In fact, the presence of determined language structures within a given text depends not only on what is allowed by grammar and/or the individual speaker's choices, but also on what the communicative conditions render more functional and preferable.

VoLIP can contribute to this program because it is a linguistic resource which presents texts from many different social and communicative domains, registers, and geographical varieties of Italian. Moreover, it gives parallel access to the audio and orthographic transcriptions of the spoken material to allow a better understanding of the communicative interaction and its role in the verbal exchange. This is necessary to evaluate the weight of different sociolinguistic variables in shaping spoken Italian to focus on the proper speech features.

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# What Might a Corpus of Parsed Spoken Data Tell Us about Language?

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**Abstract:** This paper summarizes a unifying and critical methodological perspective towards corpus linguistics. The processes involved in annotating corpora and carrying out research with corpora are *cyclic*, i.e., involving both bottom-up and top-down processes.

This perspective unifies “corpus-driven” and “theory-driven” research as two aspects of a research cycle. We identify three distinct but linked cyclical processes: annotation, abstraction, and analysis. These cycles exist at different levels and perform distinct tasks, but are linked such that the output of one feeds the input of the next.

We identify three types of evidence that can be obtained from a corpus: factual, frequency and interaction evidence, representing distinct logical statements about data. Enriching the annotation of a corpus allows evidence to be drawn based on those richer annotations. We demonstrate this by discussing the parsing of a corpus of spoken language data and two recent pieces of research that illustrate this perspective.

**Keywords:** corpus linguistics; philosophy of science; epistemology; 3A cycle; parsing; speech.

## 1. Introduction

The field of corpus linguistics has grown in popularity in recent years. Moreover, many researchers who would not otherwise consider themselves to be *corpus* linguists have begun to apply corpus linguistics *methods* to their linguistic problems, a growth that is partly attributable to an increasing availability of corpus data and tools. It therefore seems apposite to take stock, and question what kinds of research can be done with corpora and which types of corpora and methods might yield useful results.

This methodological “turn to corpora” does not have universal support. Some theoretical linguists, including Noam Chomsky, argue that, at best, any collection of language data merely provides researchers with examples of the actual external performance of human beings in a given context (see, e.g., Aarts 2001). Corpora do not provide insight into internal language or its production processes. Such a position raises questions about *what* data, if any, might be used to evaluate “deep” theories, as linguists’ personal intuitions are no more likely to pierce the veil of consciousness. Nevertheless, this contrary position raises a serious challenge to corpus researchers. We will return to the question of the potential relevance of corpus linguistics for the study of language production by reporting on some recent research in Section 6.

What do we mean by “a corpus”? In the most general sense, corpora are simply collections of language data that have been processed to make them accessible for research purposes. The largest current corpora contain primarily *written* texts, that is, texts generated by authors at keyboards, screens, or paper. These are types of language that are rarely spontaneously produced, frequently edited by others, and often included in databases due to their ease of availability. They may also be written with an imagined audience, in contrast to spoken utterances produced for a co-present (and interacting) audience. Although written data of this kind is easy to obtain, and therefore large corpora are readily compiled, this sampling methodology places significant limitations on the types of inference that might be safely drawn. The ability to test hypotheses against unmediated, spontaneously produced linguistic utterances seems paramount.

However, not all corpora are collected from written sources. In this paper, we are particularly interested in what corpora of *spoken* data, ideally in the form of recordings aligned with an orthographic transcription, might tell us about language. Transcriptions of this kind should record the actual lexical output, e.g., including false starts, examples of self-correction and overlapping speech, unedited by the speaker. In an uncued, unrehearsed context, this kind of speech data is arguably the closest to genuinely “spontaneous” naturalistic language output as is achievable. The lexical record can be aligned with an audio and video recording, contain meta-linguistic information, gestural signals, and so on.

Prioritizing speech over writing in linguistics research has other justifications aside from mere spontaneity, which might otherwise be achieved by simply recording every keystroke. Speech predates writing historically, both generally and in relation to literacy spread. Child development sees children express themselves through speech earlier than they write, and many writers are aware that their writing requires a more-or-less internal speech act. Our corpus data has approximately 2,000 words spoken by participants every quarter of an hour. By contrast, the author Stephen King (2002) recommends that authors try to write 1,000 words a day.

Allowing for individual variation, and with the exception of isolated individuals or those unable physiologically to produce speech, it seems likely that human beings produce, and are exposed to, much more speech than writing.

Axiomatically, different sampling frames obtain different kinds of corpora. Spoken data may be collected for a variety of purposes, some more representative and “natural” than others, such as telephone calls or air traffic control data. Some spoken data might be captured in the laboratory: collected in controlled conditions, but unnatural, potentially psychologically stressed, and not particularly representative. So when we refer to “spoken corpora,” we are fundamentally concerned with naturally-occurring speech in “ecological” contexts where speech output is spontaneous, uncued, and unrehearsed. An important sub-classification concerns whether the audience is present and participating, i.e., in a monologic or dialogic setting.

The fact that a corpus ideal may be away from a lab does not mean that results should not be commensurable with laboratory data. On the contrary, corpus data can be a useful complement to lab experiments. The primary distinction between laboratory and corpus data is as follows. Corpus linguistics is characterized by the multiple reuse of existing data, and the *ex post facto* analysis of such data, rather than a controlled data collection exercise under laboratory conditions. Corpus linguistics is thus better understood as the methodology of linguistics framed as an observational science (like astronomy, evolutionary biology, or geology) rather than an experimental one.

As a result of this perspective, corpora usually contain whole passages and texts, in order to be open to multiple levels of description and evaluation. Laboratory research collects fresh data for each research question, and therefore may record data efficiently, containing relevant components of the output determined *a priori*.

However, the lines between the lab experiment and the corpus are becoming blurred. Where data must be encoded with a rich annotation (see Section 4) such as a detailed prosodic transcription, data reuse maximizes the benefits of a costly research effort. Other sciences have also begun to take data reuse seriously. Medical science has seen computer-assisted meta-analysis, where data from multiple experiments are combined and reanalyzed, become increasingly standard.

Given that we have a working definition of a spoken corpus as a database of transcribed spoken data, with or without original audio files, what can such a database tell us about language? Traditional discussions of corpus linguistics methodology have tended to focus on a dichotomy between top-down “corpus-based” and bottom-up “corpus-driven” research. We will argue that both positions are one-sided and are usefully subsumed into an exploratory cyclic approach to research.

## 2. What Can a Corpus Tell Us?

There are essentially three distinct classes of empirical evidence that may be obtained from any linguistic data source, whether this “corpus” consists of plain text or is richly annotated (see Section 4).<sup>1</sup> These are

- **Factual** evidence of a linguistic event, i.e., at least one event  $x$  is observed.
- **Frequency** evidence of a linguistic event, i.e.,  $F(x)$  events are observed.
- **Interaction** evidence between two or more linguistic events, i.e., that the presence of a different event  $y$  in a given relationship to  $x$  affects the likelihood that  $x$  will occur, which we might write as  $p(x | y)$ .

Whereas much theoretical linguistic argument is given over to stating that particular expressions are or are not possible, the **factuality** of any theory is ultimately only testable against real world data. Dictionaries expand by observing new forms and earlier attestations. More controversially perhaps, we would argue that for a theoretical linguist to maintain that a particular construction found in a corpus is “bad” or “impossible” constitutes an insufficient argument, and the errant datum deserves explanation. Such an explanation might be that it represents a performance error, but this cannot be assumed *a priori*. So factual evidence might present evidence that appears to contradict or challenge existing theories.

Perhaps the least controversial statement above is that corpora are a rich source of **frequency** evidence for linguistic phenomena. Most existing corpus research concentrates on frequencies of linguistic events.

Frequency evidence has value, even if its meaning is less easy to discern. Knowing that one construction, form or meaning is more frequent than another has proven beneficial for writers of dictionaries and grammar books, helping them prioritize pedagogically. Frequency evidence may be counterintuitive, and it is harder for the intuition-driven linguist to deny corpus data this purpose. On the other hand, the most common criticism of corpus linguistics is that it consists of mere counting of words or constructions. How does such evidence relate to the concerns of the theoretician?

Frequency data must be interpreted carefully. A common confusion mixes up **exposure rates**, typically, that  $x$  appears  $n$  times per million words, and **choice rates**, that  $x$  is chosen with probability  $p$  when the choice of using  $x$  arises.

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<sup>1</sup> We could interpret the terms “corpus” and “linguistic event” under an even broader definition. Untranscribed tape recordings or hand written field notes, whilst not in the digital domain, are still “corpora” for the purposes of this definition. Such a generous definition would allow us to draw parallels with non-linguistic fields such as “digital humanities,” where researchers are engaged in the digitization and representation of cultural artefacts, such as museum exhibits and architecture. The same types of evidence are obtainable by the types of process that we will discuss in the following section.

An exposure rate tells us how frequently an audience for a set of utterances will be exposed to  $x$ . Such “normalized” frequencies are vulnerable to contextual variation (produce a different text and the exposure rate may differ). There are many reasons why a speaker might utter a particular word or construction in a given text, and thus an elevated or reduced frequency in one context over another may be due to many factors. Most importantly, however, exposure rates are not easily commensurable with linguistic theory.

A more productive way to frame frequency evidence is in terms of choice rates, i.e., the probability that speakers (or writers) will use a construction given the opportunity to do so. If we identify a superset of alternative forms including  $x$ , which we might denote as  $\mathbf{X}$ , we simply obtain  $p(x | \mathbf{X}) = F(x)/F(\mathbf{X})$ . In a lab experiment, this is equivalent to cueing a participant with an input and observing their response. Employing choice rates (also known as “the variationist paradigm”) is common practice in sociolinguistics but less common in corpus linguistics more generally.

The principal difficulty is practical. Particularly with lexical corpora, reliably identifying all possible choices at any given point is difficult. Many corpus linguists have expressed unease as the choice appears arbitrary, and a number of objections have been raised by corpus linguists to this approach. See Wallis (forthcoming a) for a thorough discussion.

Intermediate positions between hearer exposure and speaker choice are also possible.<sup>2</sup> For example, it is legitimate to survey the behavior of modal auxiliary lemmas as a comparative exercise, i.e., whether *can* or *will* are increasing as a proportion of all modals, without claiming that they are mutually substitutable, i.e., where the speaker must simply choose between them. A crucial skill for a corpus linguist is to recognize these different kinds of frequency evidence and to properly report their implications.

Finally, **interaction** evidence concerns the effect of one word, construction or utterance on others. To take a trivial example, if a speaker begins an utterance with a personal pronoun the hearer will intuit that the most likely next word will be a verb. Interaction evidence is employed in computer algorithms, such as part-of-speech (POS) taggers and parsers, but it may appear at multiple levels. An important class of interaction evidence is obtained from choice rates. If we can identify the probability of a speaker employing a construction when they have the option, we can also identify the effect of a co-occurring construction on that probability.

Note that thus far we have been discussing corpora in general without considering the classes of linguistic event that might be reliably obtained from them. If a corpus consists of plain text, then the events identified above are lexical, and this evidence can only really inform lexical studies. However, the pre-computer era corpora (Brown, Survey) may not have always been digitized, but they have always relied on annotation.

<sup>2</sup> See also, e.g., <http://corplingstats.wordpress.com/2013/04/02/a-methodological-progression> and <http://corplingstats.wordpress.com/2013/03/06/choice-vs-use>.

### 3. The 3A Cycle

Our second epistemological observation about corpus linguistics is that all traditions within corpus linguistics and related fields (such as applying corpus methods to sociolinguistic interview data) can be conceived of as consisting of three cyclic processes—**annotation**, **abstraction**, and **analysis**—bridging four distinct levels of knowledge. This approach, which we call the “3A perspective” (Wallis and Nelson 2001), is sketched in Figure 1.

Each process adds knowledge in a cycle of addition and critical reflection. Knowledge, necessary and refutable, is applied at every level, from sampling decisions to hypotheses. When we annotate a text we both add information to it—e.g., sentence boundaries, POS tags—and, simultaneously, critically reflect on our frameworks. Is it useful to have a concept such as a “sentence boundary” in spoken data? Does this word have this part-of-speech tag? Should the scheme be modified?

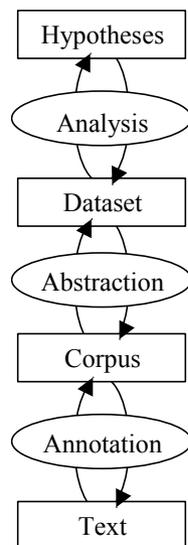
In the case of spoken data, the source is not text but an audio signal, and “annotation” is properly conceived of as including the process of transcription. Whatever the source data, both the annotated text and the annotation scheme are subject to change over the course of annotating an entire corpus. The more experimental the annotation scheme, the more likely that it will be subject to co-evolution while the corpus is annotated. Obtaining complete coverage of a scheme across a corpus will inevitably throw up unanticipated challenges in dealing with the new “facts” we observed in the previous section (hence factual evidence is sometimes referred to as *coverage* evidence).

In corpus linguistics, the annotation cycle is typically, although not exclusively, performed by the collectors of the corpus prior to distribution. However, such a practice is clearly not a *defining* characteristic of corpus linguistics. Indeed, one team might add annotation to data obtained by another, or the same team might add or modify annotation in a series of phases, each with their own release.

Usually, however, corpus linguistics practice places a sharp line between annotation and abstraction. Annotation commonly ends with the distributed corpus, although as we see in Section 5, sometimes researchers have to perform additional annotation steps to manually classify data according to unencoded criteria.

Abstraction begins the process of “research proper,” when linguists *with a particular research goal in mind* attempt to obtain data from an annotated corpus and transform it into a dataset that can be analyzed using conventional data analysis methods. “Abstraction” is sometimes termed “data transformation” or “re-representation” in the field of Knowledge Discovery, or “operationalization” in Experimental Design and Statistics textbooks.

Abstraction selects data from an annotated corpus and maps it to a regular dataset for the purposes of statistical analysis. A corpus query system is the principal tool for this



**Figure 1.** The 3A perspective in corpus linguistics (after Wallis and Nelson 2001).

process. When a query is performed, the researcher obtains a set of matching results, including the total frequency. How does she know that her results are correct, i.e., that they reliably identify the examples that she wants? Like annotation, abstraction must be cyclic, including the reverse process (“concretization”). In other words, it is necessary for the researcher to see how her query matched cases in the corpus, try other queries, etc.

Even experienced researchers have to learn an annotation scheme to formulate meaningful queries on a given corpus. To do this they must be able to perform abstraction by approximation, evaluation, and refinement.

In the case of lexical queries, the opportunity for testing and revision may appear unimportant. Provided that searches are not case sensitive, lemmas are identified appropriately, etc., it may be assumed that a trained researcher will obtain an accurate query first time. However, the more complex the annotation scheme, the greater the need for the researcher to review and revise her queries in the light of their application. Indeed, it is difficult to see how a researcher can ever be said to “know” a parsing scheme, for example, sufficient to obtain data for her research, unless she is able to see how it has been applied to the relevant data in a corpus.

A crucial problem, and a standard objection to richly annotating a corpus, concerns **representational plurality**. Assume that in any given field of research, linguists differ in their ideal representation scheme, and schemes are often in a state of development themselves. Schemes may differ terminologically, but far more importantly, they may differ in their classification and structuring of linguistic phenomena.

Thus Quirk et al. (1985) exclude objects from the VP analysis, Huddleston and Pullum (2002) include objects, dependency grammars represent Quirk’s VPs another way, and so on. After some 20 years of corpus parsing, we have a wide range of corpora attempting to capture an overlapping set of comparable linguistic performances with very different schemes. Leaving aside the fact of divergent corpus annotation schemes, any linguist who uses a corpus must abstract from the annotated corpus to concepts that are commensurable with their preferred framework.

The necessity and importance of abstraction as a process has been frequently overlooked. However, it is a central issue in the design of software tools for working with richly annotated corpora. As we noted, lexical corpora with simple POS tagging may not require an extensive cyclic process of query refinement. The more extensive the annotation, however, the more frequently a researcher will need to try out different queries.

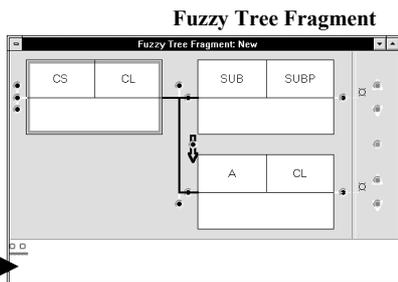
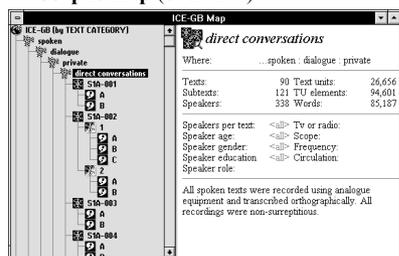
The *ICECUP* software (Nelson et al. 2002) was designed around the abstraction cycle to support research with a parsed corpus: initially, the 1 million word *British Component of the International Corpus of English* (ICE-GB), 60% of which consists of transcribed speech.

The main query system is a diagrammatic query representation that mirrors the visual appearance of parse trees in the corpus: *Fuzzy Tree Fragments* or “FTFs.” An FTF is a kind of “abstract tree” where both nodes and links between nodes may be incompletely specified, similar to a lexical wild card. At the top right of Figure 2

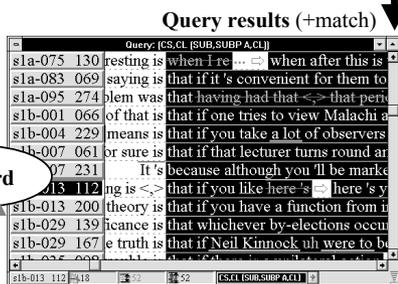
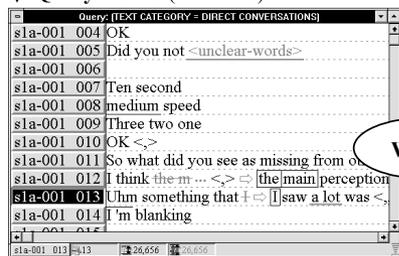
below we have an FTF that searches for structures consisting of subject complement clauses (CS,CL) containing a subordinate phrase (SUB,SUBP) followed by an adverbial clause (A,CL).<sup>3</sup> When a query is applied, the set of matching cases are immediately presented by the interface (middle right). Researchers can review how their queries have been matched to the corpus and identify false positive cases. A “Wizard” tool permits a researcher to select parts of the tree annotation and convert it into a FTF.

Level

1. Corpus map (overview)



2. Query results (text units)



3. Individual text unit

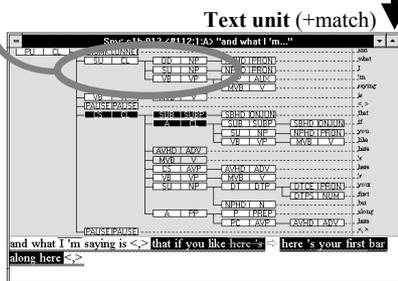
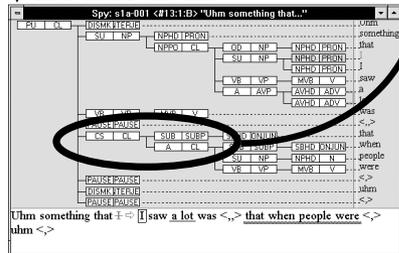


Figure 2. Exploring the corpus, after Nelson et al (2002): from the top, down (left), and, using the Wizard in an exploration cycle with FTFs (right).<sup>4</sup>

3 See also Nelson et al. (2002) and [www.ucl.ac.uk/english-usage/resources/ftfs](http://www.ucl.ac.uk/english-usage/resources/ftfs).

4 Note that, for reasons of space, ICECUP defaults to a left-right visualization of tree structures. The top of the tree is on the left, and the sentence runs down the page.

The tools are linked together in a forgiving user interface on top of a specialized database system. Each window in Figure 2 depicts a different tool and the arrows show how corpus exploration is typically carried out. Users may identify a text from the Corpus Map (top left) and, by browsing the text, an individual sentence tree (bottom left). The Wizard tool allows the researcher to select part of this tree and create an FTF query (top right). This query can then be applied to the corpus, and the matching elements in the text unit can be seen in both the query results (middle) and each tree (bottom right).

Figure 2 also shows how ICECUP tools are considered to relate to one of three levels of generalization: Level 1 consists of sets of queries, Level 2 consists of query results (sentences/matching cases) and Level 3 corresponds to individual instances (sentence + tree annotation).

Finally, the 3A perspective can be applied to many processes not immediately identified as “corpus” linguistics. Processes of annotation, abstraction, and analysis may be usefully employed in numerous automatic “end-to-end” systems. Consider a natural language “understanding” application where human intervention is not possible in real-time and therefore knowledge must be encoded in advance. Suppose natural language processing algorithms are applied to annotate an input stream, such as speech recognition and part-of-speech tagging; particular application features, e.g., combinations of keywords and POS tags are abstracted; and finally processed for particular actions. If Langley or GCHQ are listening in, rest assured that their systems are engaged in identifiable processes of annotation, abstraction, and analysis!<sup>5</sup>

#### 4. What Can a Richly Annotated Corpus Tell Us?

Let us now briefly consider how the three types of evidence identified in Section 2 apply to a richly annotated corpus. A good example is a **parsed corpus**, i.e., a corpus like ICE-GB, or its relation, the *Diachronic Corpus of Present-day Spoken English* (DCPSE),<sup>6</sup> consisting wholly of spoken transcriptions. The same principles apply, however, to any corpus containing annotation that represents one or more levels of linguistic structure, such as morphological or pragmatic structure.

In this paper, we focus on parsed corpora, where every sentence has been given a tree analysis according to a chosen scheme. In the case of spoken data, where “sentences” may not exist or must be inferred, decisions to split utterances into sentences will be integral to the parsing process, i.e., they are part of the analytical decisions that

<sup>5</sup> Similarly, statistical methods and machine learning algorithms can be applied to each cycle. The most common application is in POS-tagging and parsing, which may be seen as sub-processes within the annotation cycle. In principle, knowledge at any level may be enhanced by statistical generalization from the level below. “Skipping” levels, however, risks superficial generalization from surface features.

<sup>6</sup> See [www.ucl.ac.uk/english-usage/projects/ice-gb](http://www.ucl.ac.uk/english-usage/projects/ice-gb) and [www.ucl.ac.uk/english-usage/projects/dcpse](http://www.ucl.ac.uk/english-usage/projects/dcpse).

must be made in applying the scheme to the data. The notion of a “linguistic event” identified in general terms in Section 2 may now be extended to

- **any single term** in the framework (including the permutation of descriptive features),
- **any construction** formed of multiple terms in the framework (such as two terms bridged by a relationship link or a particular clause structure), and
- **any combination** of the above with elements of the source text.

As multiple levels of annotation are added, it is additionally possible to identify co-occurrences *between* levels. Thus a corpus consisting of parsed and pragmatically annotated text would permit grammatical and pragmatic elements to be identified in combination, such as a particular opening clause structure in a response, a rising tone in a non-interrogative clause, etc.

All three classes of evidence discussed in Section 2, i.e., factual, frequency and interaction evidence, apply to these linguistic events, which we previously denoted by  $x$  and  $y$ . Thus, using such a corpus we can determine whether a particular construction, formed by a combination of annotated terms, is found in the corpus ( $x$  exists, i.e., factual evidence), what its distribution might be (frequency evidence,  $F(x)$ ), and whether the presence of a term increases the likelihood that another, structurally-related term is present (interaction evidence,  $p(x | y)$ ).

If we must enrich our corpora with annotation, how do we choose between potential schemes? In parsing, for example, schemes applied to corpora in the past were chosen according to a range of criteria. These included simplicity and minimalism (Penn Treebank I, Marcus et al. 1993), text mining applications (Treebank II, Marcus et al. 1994), and linguistic tradition (ICE, based on Quirk et al. 1985; Prague Dependency Grammar, Böhmová et al. 2003, etc.).

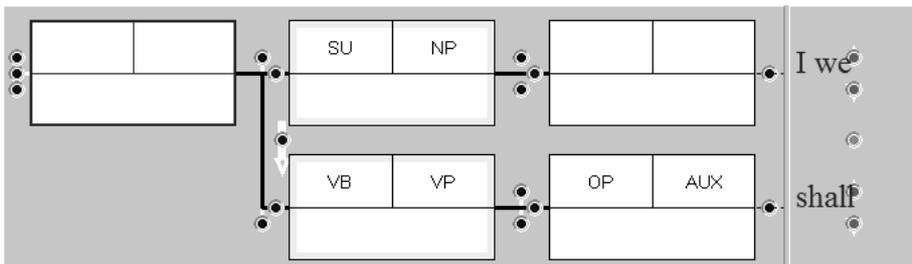
In this paper we take a different approach. Let us consider the question from the perspective of a corpus researcher. There are at least two different ways of evaluating an annotation scheme, such as parsing or any other level of rich annotation, applied to corpora.

- **Annotation facilitates abstraction** (“a handle on the data”). In this theory-neutral position, the annotation scheme simply makes useful distinctions between classes of linguistic event (differentiating nouns and verbs, say) and allows us to retrieve cases reliably. From this perspective, it is not necessary for a researcher to “agree” to the framework employed, provided that distinctions embodied in the scheme are sufficient for research goals. In other words, provided that a researcher may reliably abstract from annotated corpus to their experimental paradigm, the actual annotation encoding is irrelevant.
- **Annotation facilitates theoretical goals** (potentially, the identification of linguistic processes). Models of priming and spreading activation imply that decisions made

by speakers and writers are influenced probabilistically by previous decisions, as we see in Section 6. An annotation scheme that enables evidence of this kind to be found reliably would thus be better justified than one that does not. Design of such a scheme is less theory-neutral than in the first position, and the ideal annotation would be one that reflected a credible trace of the language production process undergone by the speaker, what we have elsewhere referred to as “speaker parsing” as distinct from “hearer parsing.”

In the first perspective, annotation schemes may be compared in relation to their ability to reliably retrieve linguistic events (Wallis 2008), a criterion sometimes termed *decidability*. We can say that a corpus whose annotation reliably classifies nouns and verbs is better than an unreliable classification, and a representation that explicitly denotes subjects of clauses is preferable to one that does not. However, as these examples imply, this criterion is circular. Why should we assume, *a priori*, that reliable retrieval of subjects or nouns is important? Moreover, as Wallis (forthcoming b) observes, such criteria admit redundancy, because any representation can improve on another by simply gaining levels and becoming more complex.

The second position builds on the atomized linguistic event retrieval perspective of the first. True, it is useful for linguistic events to be reliably identified. But it is the ability to obtain interaction evidence that has a plausible *linguistic* cause that ultimately justifies decisions regarding annotation scheme design. If event *y* and event *x* correlate together in their co-occurrence, and we can eliminate non-trivial causes of this correlation (e.g., textual topic or contextual artifacts), we are left with explanations that are more likely to be essentially psycholinguistic, such as priming or spreading activation.



**Figure 3.** An FTF for a first person subject (*I* or *we*) followed by auxiliary verb *shall*, after Aarts et al. (2013). To search for *will* and *'ll* the lexical item *shall* is replaced.<sup>7</sup>

<sup>7</sup> Gloss: SU,NP = subject noun phrase; VB,VP = verb phrase; OP,AUX = auxiliary verb acting as an operator. Some links are specified: white down arrow = node follows, but not necessarily Immediately; absent up/down links below SU,NP node insists that the NP has only one child, i.e., it consists of the single pronoun *I* or *we*. Finally, and possibly the most subtle point, both words are directly connected to their associated node.

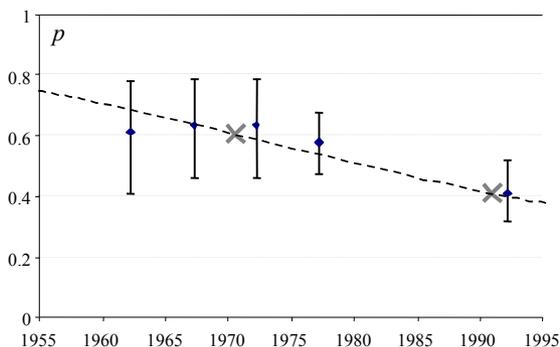
The argument that linguistic annotation schemes should ultimately be evaluated by their ability to provide evidence for theoretically-motivated goals is consistent with Lakatos's (1978) epistemology of **research programs**. This philosophy of science views science as pluralistic competition between research programs. Successful research programs make novel predictions that can be tested. Declining programs fail to be productive, for example, they fail to explain phenomena that competing programs are able to incorporate.

Annotation schemes are the “auxiliary assumptions” of the research program. From this perspective, the annotation scheme cannot be evaluated in the abstract, but should be considered in terms of whether it facilitates the end goals of the research program—and it is the success or otherwise of the program that ultimately determines the validity of the scheme. The key question, then, is what linguistic research goals could annotation schemes attempt to further? We will attempt an initial answer in Section 6, but first let us look at research of the first kind.

## 5. Sociolinguistic Influences: Modal *Shall/Will* over Time

Much research is typical of the “annotation drives abstraction” perspective. Aarts et al. (2013) looked at the alternation between the modal auxiliaries *shall* and *will* over time, in first person declarative contexts.

Whereas previous studies (e.g., Mair and Leech 2006) had considered *shall* and *will* (including negative *shan't* and *won't* and cliticized *'ll = will*), these studies had a number of drawbacks. First, they tended to analyze these modals in terms of exposure rates (*shall* and *will* per million words). This meant that it was not possible to factor out sampling variation due to varying potential to use either *shall* or *will* (e.g., in past-oriented texts either would be less frequent than in present-oriented ones). Despite this, it is a relatively simple matter of reanalysis to pose the question in terms of a basic choice rate (*shall* as a proportion of the set  $\{shall, will\}$ ).



**Figure 4.** Declining use of *shall* as a proportion  $p$  of the set  $\{shall, will\}$  with first person subjects, half-decade data (“1960” = 1958–62 inclusive, etc.) (after Aarts et al. 2013).

Second, these studies were carried out on part-of-speech tagged corpora which were not parsed. However, alternation of *shall* and *will* rarely exists except with first person subjects. The ideal is to identify just those cases of *shall* where the speaker has a genuine choice of using *will* instead, and vice versa. Consider the interrogative case: *Shall we go to the park?* and *Will we go to the park?* are semantically and pragmatically distinct, and therefore do not freely alternate. We therefore focused on first person declarative cases, and for similar reasons we also decided to eliminate negative cases.

This was made much easier by the fact that we were working with the parsed corpus, DCPSE, and ICECUP. In order to reliably extract cases of first person declarative positive uses of *shall* and *will*, we were able to use FTF queries like Figure 3.

The FTF works on the annotation scheme by relating individual terms and structure, and the result is a reliable retrieval mechanism for obtaining relevant cases. The annotation is a “handle on the data” allowing us to pull out instances of linguistic events, in this case the use of *shall* or *will* in the particular context required. We obtained graphs such as the one in Figure 4, showing the tendency to prefer *shall* over *will* falling over the course of time.

Consider the steps that would be required to obtain these results were DCPSE only analyzed using part-of-speech tagging. It would be possible to construct queries that searched for patterns of a first person pronoun followed by *shall* or *will*, but we would then have to manually review each pattern to verify that it was part of the same clause. In effect, we would be performing the necessary additional annotation stage (cf. Figure 1) at research time. Annotation is unavoidable.

Similarly, in this study, Joanne Close manually classified each instance of previously identified *shall* and *will* by their modal semantics (Epistemic, Root, and “other”), allowing her to conclude that the identified fall in an overall preference for *shall* was actually due to a sharp decline in Epistemic uses of *shall*. Again, this step is a type of annotation, except that it is being performed by researchers using the corpus for a particular research goal instead of being performed by the publishers of the corpus.

## 6. Interacting Grammatical Decisions: NP Premodification

The previous illustrative study examined variation in a linguistic choice over time. Other sociolinguistic variables, such as speaker gender, text genre, mode, contrasting monologue and dialogue, etc., are within the same experimental paradigm.

On the other hand, if we are interested in linguistic, rather than sociolinguistic, influences on language choices, we need to extract and attempt to interpret interaction evidence. Interaction evidence may simply consist of exploring two closely related grammatical variables (see Chapter 9.7 in Nelson et al. 2002). Examples given include the interaction between transitivity and mood features of clauses, and the phrasal marking of an adverb and that applying to a following preposition within the same clause.

Recent research (Wallis, forthcoming b) examines a different and more general phenomenon, i.e., serial repeated additive decisions applied in language production. This research paradigm evaluates decisions to add or not to add a particular construction to a superordinate one, and tests whether the speaker or writer is more or less likely to make the decision on subsequent occasions.

This methodology can be seen as a way of examining construction complexity (a static interpretation) or as a way of examining the interaction between language production decisions (a dynamic one). Either way, the patterns we obtain are highly interesting, occasionally counter-intuitive, and worthy of theoretical discussion.

A simple illustrative example is attributive adjective phrases premodifying a noun phrase head, thus we have *ship*, *green ship*, *tall green ship*, etc. We can use FTFs to identify NPs with a common noun head, NPs with at least one attributive adjective phrase, NPs with at least two adjective phrases, and so on. We obtain the data in Table 1 by applying these FTFs to ICE-GB across both speech and writing.

From the frequency of at least  $a$  attributive phrases,  $F(a)$ , (top line) we derive a set of probabilities,  $p(a) \equiv F(a)/F(a-1)$ . These probabilities are the observed likelihood that, given  $a-1$  attributive phrases, the speaker/writer will add a further adjective phrase. Thus we can see that slightly less than 20% of NPs (19.32%) contain at least one attributive adjective, but less than 8% of these contain two.

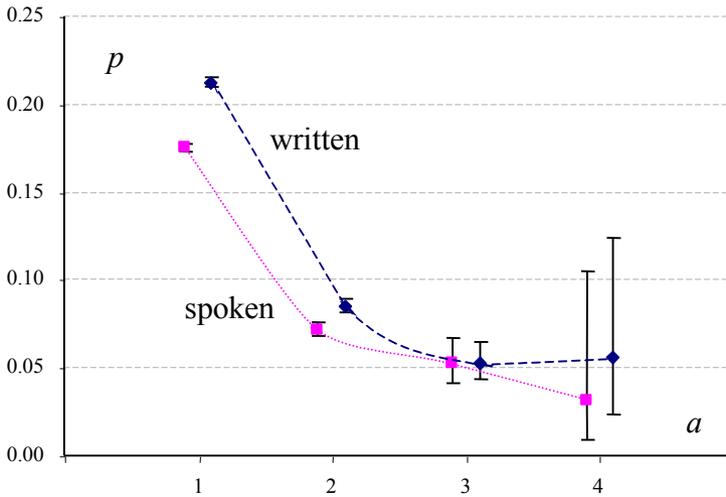
We can plot this probability over the number of adjective phrases,  $a$ , as in Figure 5 overleaf. This graph includes 95% Wilson score confidence intervals and distinguishes spoken and written performance.<sup>8</sup>

The first point to note about this graph is that the null hypothesis would be that decisions at each level do *not* interact. When we toss a coin repeatedly, the probability of obtaining each individual tail or head is constant.

| $a$ adjective phrases  | 0       | 1      | 2      | 3      | 4      |
|------------------------|---------|--------|--------|--------|--------|
| “at least $a$ ” $F(a)$ | 193,135 | 37,305 | 2,944  | 155    | 7      |
| Probability $p(a)$     |         | 0.1932 | 0.0789 | 0.0526 | 0.0452 |

**Table 1.** Frequency and relative additive probability of NPs with  $a$  attributive adjective phrases before a noun head, in ICE-GB, after Wallis (forthcoming b).

<sup>8</sup> Two points on the same line may be compared visually by checking whether an earlier point is within the interval for a later one. Such cases will be statistically significant.



**Figure 5.** Declining probability of adding attributive adjective phrases to an NP noun head; data from ICE-GB, patterns for speech and writing.

Plotting  $p(a)$  in Figure 5 reveals that the decision to add a second attributive phrase after a first (the particular order of decisions is irrelevant, and they may be made in parallel) is less probable than the decision to add the first, and so on. By the fourth adjective phrase, we run out of data and obtain wide confidence intervals, but the overall trend seems reliable: far from decisions being independent, they interact, and do so consistently in a negative feedback loop.

This is not a universal pattern within grammar. Wallis (forthcoming b) considers adverbial phrases premodifying a VP (e.g., *quickly*, *intelligently*, *getting to the point*) and finds no interaction between the decision to add one or two adverbial premodifiers. It is necessary to consider possible explanations for this phenomenon.

There are at least three potential sources of this interaction.

- **Semantic and logical constraints**, which would include the well-researched English phenomena of attributive ordering (cf. *tall green ship* vs. *green tall ship*) and avoidance of illogical descriptions (*tall short ship*);
- **communicative economy**, avoiding unnecessarily long descriptions, especially on the second and third citation (on, subsequent occasions referring simply to *the ship* rather than *the tall green ship*); and
- **psycholinguistic attention and memory constraints**, so that speakers found it more difficult to produce longer constructions.

In the case of NP premodification, the most likely explanation is the first. Communicative economy would predict a rapid drop from  $p(1)$  to  $p(2)$  but no subsequent fall. Psycholinguistic constraints are implausible because the added constructions themselves are relatively “light” memory-wise. Indeed, if a speaker forgot that they had said a previous adjective phrase, it seems more likely they would act in an unconstrained, rather than a constrained manner. However, the impact of psycholinguistic constraints are much more plausible explanations for patterns observed with multiple postmodification of NPs (e.g., *the ship [by the harbor] [which we sailed on]*) and embedding (*the ship [by the harbor [in the town]]*), which the author also examines.

Figure 5 also shows that the speech and writing data does not have the exact same distribution, so we can see that a greater proportion of NPs uttered by speakers have no adjective phrases. When they do employ adjective phrases, they tend to use fewer phrases, and so on. There may be a number of possible reasons for this, e.g., the fact that in a conversation the audience is present and referents require less elaboration. Nonetheless, both datasets obtain a similar overall pattern.

Note that the evidence in this experiment is only obtainable from a corpus. One would not spot this trend by laboratory experiment: we simply do not have enough data. For NP premodification, employing a parsed corpus is not required, and simple sequences of the form <ADJ> <N> obtain similar results (with a few more errors). On the other hand, to inspect trends generated by serial embedding and postmodification, a parsed corpus is necessary. As soon as we want to look at non-adjacent terms or structure, the reliable representation of that structure is essential.

Finally, the fact that we can compare spoken and written data is also important. As we noted, the vast majority of corpora exclusively or overwhelmingly contain written data. But we find essentially the same pattern in speech and writing. Figure 5 confirms that we are observing a linguistic phenomenon that is not attributable to a special character of writing or speech: for example, a possible tendency for writers to avoid excessive NP length by editing. The presence or otherwise of an audience may affect the rate of decline but not the overall tendency.

## 7. Conclusions

We have attempted to summarize the state-of-art in corpus linguistics to show that it does not embody a competing methodology with other approaches to linguistics research, such as theoretical linguistics and psycholinguistics. On the contrary, corpus linguistics can obtain linguistically interesting and novel research outcomes which require theoretical explanation and additional psycholinguistic experiment. Science typically proceeds by triangulation rather than refutation, not least because every field of study relies on “auxiliary assumptions,” underpinning assumptions that are necessary for an experiment to take place. Biological research with optical

microscopes relies on optical physics, early DNA research relied on electrophoresis, and corpus linguistics relies on standards of linguistic representation, including transcription/annotation.

Whereas in settled science, auxiliary assumptions infrequently change (although new techniques come to the fore), linguistics frameworks are not universally agreed. Consequently we must expect representational plurality and competing frameworks in our corpora for some time to come. In this paper we have attempted to summarize the different types of evidence that might be obtained from a corpus, and the impact of employing a particular type of rich analysis, a phrase structure parse analysis, on this evidence. We have also shown how different representations in a corpus (annotation) are partially separable from research goals, by emphasizing the need for an explicit mapping between them (abstraction).

The processes of developing annotation schemes, refining queries, and specifying experimental datasets are knowledge-rich and cyclic. This means that annotation is necessarily conditional, and subject to revision, either during the compilation of a corpus, or in successive post-publication revision cycles.

Abstraction is also cyclic, and, given the plurality of frameworks, necessarily so. We briefly noted how software may be developed from the ground up to accommodate this. Facilitating abstraction in this way has enabled complex novel experiments. It has also permitted us to develop a range of grammar teaching resources that draw from ICE-GB but deviate from the parsing scheme (Greenbaum 1996; Aarts and Wallis 2011; and [www.englishcious.org](http://www.englishcious.org)).

Finally, we attempted to illustrate our argument with two recent studies, a relatively conventional sociolinguistic predictor of diachronic language change, and a more unusual experiment which examined interaction between grammatical structures, which we might term “intra-structural priming.” The fact that both sets of results are only obtainable from volumes of linguistic data, i.e., corpora, demonstrates what corpus linguistics is capable of achieving. Contrary to the dominant paradigm of “big data” corpus linguistics, these studies emphasize the value of *rich* data.

Corpus linguistics cannot prove the correctness of one internal framework over another. In fact, due to dependence on auxiliary assumptions, no scientific research program is capable of refutation of deductive internal proof by inductive observation. Our equipment may be wrong! Rather, recent research of the kind we describe in Section 6 may provide evidence that can *validate* possible frameworks, just as physical experiments validate, but do not “prove,” theories of gravity.

This, ultimately, is the answer to Chomsky’s objection regarding the use of corpora. It rests on a misconception about science and philosophy. Science validates and provokes theories, but theories are not disproved or proved by evidence alone. Without such engagement with real-world data, however, theory rests in the realm of philosophy—however sophisticated and computer literate its adherents.

## Acknowledgments

The author would like to thank Bas Aarts, Joanne Close, and Gerald Nelson for their support and critical engagement with the 3A perspective over the years. As a methodological review, this paper cannot do justice to the research they contribute here, and colleagues are encouraged to read the original books and papers cited.

Building a large parsed corpus such as ICE-GB and DCPSE is necessarily a large team effort. This paper is dedicated to all our transcribers and annotators. I hopefully convey the point that the linguistic knowledge they painstakingly applied to the corpus was worthwhile! Sixteen years after ICE-GB was first published we are still scratching the surface of what we might be able to do with it.

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# **Phonetics and Phonology**



# Age- and Gender-Related Differences in Formant Structure during the Stabilization Process of Vowels

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**Abstract:** The stabilization process of vowels is one of the most decisive phases of language development. The present study aims to investigate the effect of age and gender on vowel production in the speech of Hungarian children between the ages of 7 and 13. We analyzed the duration and the first two formants (F1, F2) of more than 15,000 tokens of manually measured Hungarian vowels, as well as the fundamental frequency (F0) of the children's speech. The results confirmed that there were large individual differences in the vowels, irrespective of age and gender. However, there was evidence for maturation in F0 and vowel duration values across ages and gender. The vowels pronounced by 11-year-old children are still different from those of adults (in terms of the parameters that were analyzed); however, they become more like those of adults by the age of 13.

**Keywords:** vowels; formant structure; fundamental frequency; Hungarian-speaking children.

## 1. Introduction

Children gradually acquire their first language during their first years of life. In order to construct meaningful utterances, development is necessary in many aspects of language: phonological (e.g., Vihman 1996), lexical (e.g., Nelson 1973), morphological (e.g., Brown 1973), syntactical (e.g., Bloom 1970), and pragmatical (e.g., Ninio and Snow 1996), etc. Children must learn the (articulatory and phonatory) movements necessary to produce words in an adult-like manner, which means that appropriate speech-motor skills are required to achieve adult-like pronunciation. As every child encounters a wide range of pronunciation during parent-child interactions, some of the variations

in his/her speech are organized according to phonological principles, while others are sociolinguistically organized. In monolingual situations, the given linguistic repertoire is a more or less stable factor in the acquisition process (Khattab 1999). The present study aims to investigate the acoustic-phonetic patterns of vowel production by children aged between 7 and 13 in order to follow their age- and gender-related development in the parameters that are analyzed.

The findings of child language research have revealed that the earliest sounds of children are universally the same; these are the basic vowels and consonants of every language. The explanation of this assumption may be associated with the visual feedback of speaking (the sight of articulation, lip movements) or physiological factors associated with infants. The universal nature of language development is also reflected in the fact that children with different L1s produce similarly organized sound sequences (e.g., CV, VC, and CVC syllables). Hungarian children acquire phonological distinctive features in a specific order: palatal-velar opposition is acquired earlier than the phonological length of vowels (Albertné 2004).

The acoustic structure of vowels, as a consequence of articulation, is influenced by numerous factors such as the age, physical status, or gender of the speaker (Huber et al. 1999; Perry et al. 2001). Since the length of the vocal tract determines the overall patterns of formant frequencies, these patterns change with age, and depend on gender (Fant 1966; Whiteside and Hodgson 2000). Concerning the relationship between physical changes (“anatomic reorganization” from the age of 7 to 18; see Vorperian et al. [2005]) and speech development, it has been shown that as the length of the vocal tract increases during the course of development, formant frequencies decrease (Fant 1960; Fitch and Giedd 1999). However, this relationship is not linear; the findings of the acoustic studies indicate that formant frequencies do not decrease during the first two years of life, even though there are changes in the length of the vocal tract during this period (Kent and Murray 1982; Robb et al. 1997).

Perry et al. (2001) documented acoustic differences between males and females up to the age of four. They found that vowel formant frequencies differentiate gender for children as young as four years of age. The values of the formant frequencies are lower in boys’ than in girls’ speech at the same age (e.g., Lee et al. 1999). The formant values are highest in children and lowest in adult males (Huber et al. 1999). On the basis of Hungarian studies with six- and seven-year-old preschoolers (Deme 2012) we can also see that vowel formants in children’s spontaneous speech are realized at higher frequency values than those of adults.

Besides physiological maturation, changes in children’s speech are also due to phonological development. A number of researchers studying early phonological development have suggested that the child’s early vocabulary may originally be represented at a holistic level, i.e., it is not phonemes, but features, or articulatory gestures, that are the fundamental units of perception and production (Browman and Goldstein 1986).

Organization in terms of phonemic segments emerges only gradually in early childhood (Ferguson 1986; Jusczyk 1986; Menyuk and Men 1979; Fowler 1991). Phonological development and articulatory accuracy are often correlated to phonological awareness skills, meaning the ability to detect and manipulate sounds at the levels of syllables, onsets and rimes, and phonemes (Barbour et al. 2003). It has also been shown that there is a connection between phonological awareness and the development of reading and spelling (Goswami 2002), and there is an apparently language-universal sequence in the development of phonological awareness skills (Durgunoğlu and Öney 1999). Research on Hungarian children's phonological awareness revealed that there are only minor differences in the developmental sequences between English-speaking and Hungarian children (Jordanidisz 2009). Many children with learning disabilities have problems in their ability to process phonological information. In order to make practice more enjoyable and efficient, there has been an attempt to construct a computer-aided phonological awareness teaching system with an automatic phoneme recognizer (Kocsor and Kovács 2002).

There has been extensive research on the F0 characteristics of children at various ages. Most of these investigations indicate that there is no significant difference in the fundamental frequency of boys and girls prior to puberty (e.g., Lee et al. 1999; Vorperian et al. 2009). Hasek et al. (1980) revealed that a male/female difference in fundamental frequency emerges by the age of seven, and that fundamental frequency decreases significantly in male children only between the ages of five and ten. According to Lee et al. (1999), discrete male/female differences in F0 are evident around the age of 12. It was also found that between the ages of 4 and 12 formant frequencies differentiate gender, whereas after the age of 12 the fundamental frequency differentiates gender (Busby and Plant 1995; Perry et al. 2001).

The present cross-sectional study analyzes the formant structure of vowels and F0 in children in various phases of language acquisition between the ages of 7 and 13. The paper addresses three questions:

- At what age do vowel production and fundamental frequency of speech become adult-like?
- What differences can be observed in formant structure between boys and girls?
- How does gender affect F0 between the ages of 7 and 13?

Three hypotheses were defined:

- there would be significant differences concerning the F1 and F2 values of all the vowels that were analyzed between boys and girls in each age group;
- the formant structures and duration of the 13-year-old children's vowels would converge to adult patterns;
- F0 would become lower in boys' than in girls' speech no earlier than at the age of 13.

## 2. Methodology

### 2.1 Participants

Eighty typically developing monolingual Hungarian-speaking children participated in this study. The analysis was cross-sectional and included four age groups: 7-, 9-, 11-, and 13-year-old children. The 7- and 9-year-olds were from the lower grades, while the 11- and 13-year-olds were from the upper grades of elementary schools in the capital city of Hungary. We compared our data with the data on preschoolers' and adults' vowel structures from previous Hungarian literature (Gráczki and Horváth 2010; Gósy and Beke 2010; Bóna 2014). There were 20 children in each age group (Table 1). None of them had any hearing disorders, and their intelligence fell within the normal range (HAWIK). All of the children had similar social and cultural backgrounds.

|                     | Age (year;<br>month) | Number of<br>children | Number of<br>boys | Number of<br>girls |
|---------------------|----------------------|-----------------------|-------------------|--------------------|
| <b>7-year-olds</b>  | 7;2–7;7              | 20                    | 10                | 10                 |
| <b>9-year-olds</b>  | 9;4–9;10             | 20                    | 10                | 10                 |
| <b>11-year-olds</b> | 11;4–11;10           | 20                    | 10                | 10                 |
| <b>13-year-olds</b> | 13;1–13;9            | 20                    | 10                | 10                 |

**Table 1.** Age and gender distribution of participants.

### 2.2 Material

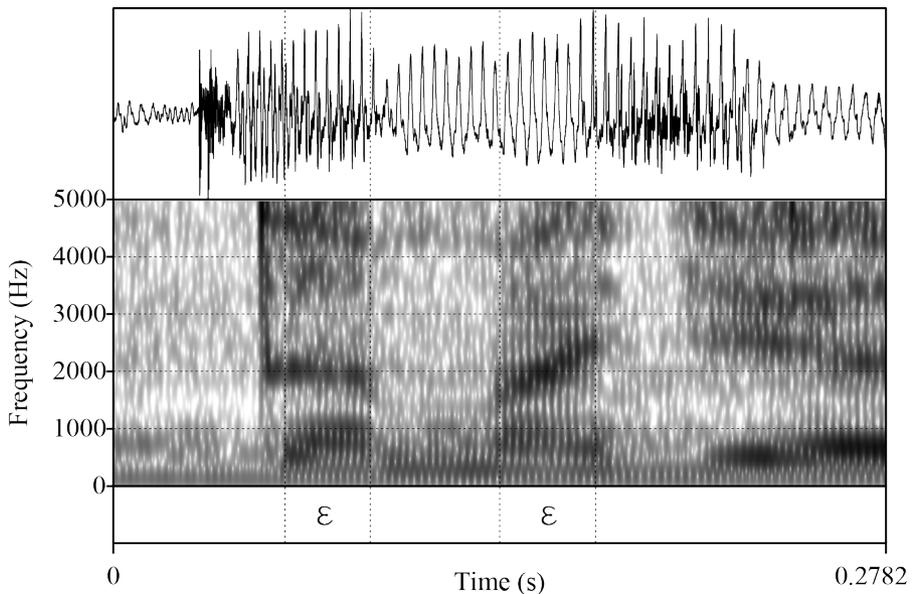
The speech material consisted of spontaneous speech samples (digital recordings at a 44.1-kHz sampling rate and a 16-bit resolution). One part of the recordings was made by the two authors, while the other part was randomly selected from the GABI children's database (Bóna et al. 2014). This database contains spontaneous and read speech from preschool and school-age children (ages between 3 and 18). All the participants were tested individually in a quiet room in their schools. The children talked about their family, school, and free time activities for various lengths of time. In order to compare the children's data, we analyzed a one-minute part from the middle of each recording. The data set contained approximately 15,000 tokens of nine manually measured Hungarian vowels. Table 2 shows the distribution of the vowels that were analyzed regarding age and gender.

|      | 7-year-olds |       | 9-year-olds |       | 11-year-olds |       | 13-year-olds |       | overall |
|------|-------------|-------|-------------|-------|--------------|-------|--------------|-------|---------|
|      | boys        | girls | boys        | girls | boys         | girls | boys         | girls |         |
| [ɔ]  | 381         | 396   | 375         | 413   | 375          | 439   | 400          | 419   | 3198    |
| [a:] | 164         | 154   | 133         | 196   | 170          | 233   | 209          | 197   | 1456    |
| [ɛ]  | 358         | 365   | 425         | 393   | 499          | 578   | 488          | 573   | 3679    |
| [e:] | 137         | 123   | 141         | 117   | 156          | 158   | 140          | 223   | 1195    |
| [i]  | 165         | 242   | 193         | 225   | 304          | 306   | 251          | 273   | 1959    |
| [o]  | 225         | 285   | 255         | 268   | 250          | 297   | 274          | 336   | 2189    |
| [ø]  | 54          | 40    | 42          | 46    | 76           | 74    | 69           | 90    | 491     |
| [u]  | 72          | 73    | 59          | 74    | 77           | 64    | 65           | 102   | 587     |
| [y]  | 29          | 16    | 20          | 29    | 28           | 37    | 23           | 40    | 222     |

**Table 2.** Occurrences of the vowels that were analyzed regarding age and gender.

### 2.3 Method

The recordings were annotated by one of the authors (while the other one controlled and checked the annotations) and the measurements were conducted using the Praat 5.3 software (Boersma and Weenink 2011). The segmentation of the vowels was based on their second formants supported by visual analysis display of the spectrograms and oscillograms (see Figure 1 for an example).



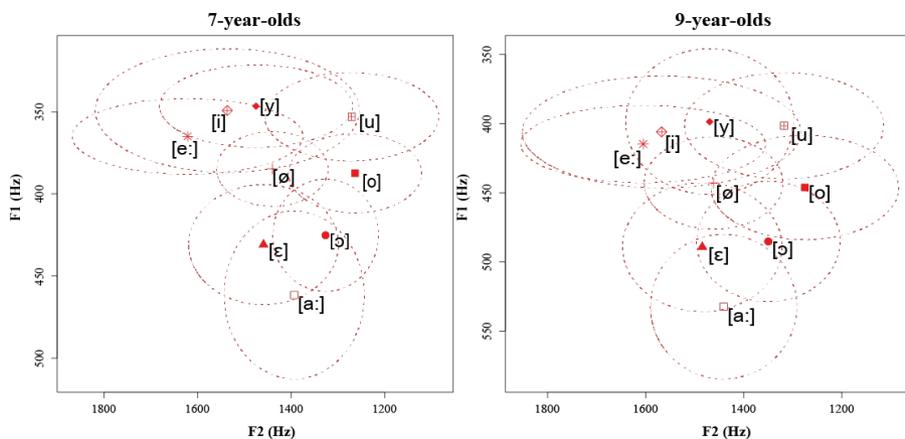
**Figure 1.** Vowel segmentation in Praat (oscillogram and spectrogram).

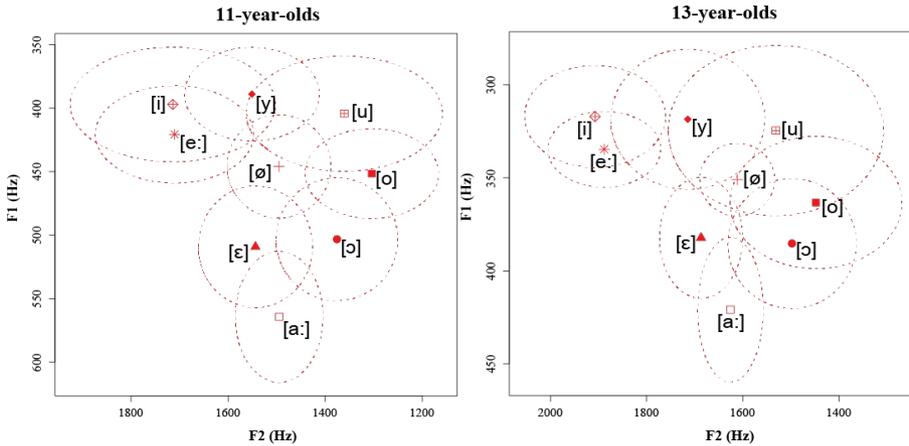
We analyzed the fundamental frequency (F0) of the children's speech and the duration and first two formants (F1, F2) of the nine Hungarian vowels. For F0 measurement we extracted the F0 means of each speech sample in Praat with the following parameters: 10 ms step size, 250 ms Hanning window size. The formant frequency was measured in the middle of the vowels, and the values were normalized to reduce the effect of individual differences in the length of the vocal tract within each age group. For vowel normalization we used Lobanov's (1971) method, which is implemented in the NORM v. 1.1 software (Thomas and Kendall 2007). Different speakers, particularly in childhood, have different mouth sizes, which in turn lead to different formant resonances. Hence, vowel normalization is crucial in order to eliminate the variation caused by physiological differences among the children. Lobanov's vowel normalization technique is based on mean values and standard deviations. We also used NORM for plotting vowels on an F1 and F2 vowel chart and drawing ellipses around vowel clusters. Univariate ANOVA was carried out on the F1 and F2 values. Statistical analysis was conducted using the SPSS 17.0 software. The confidence level was set at the conventional 95%.

### 3. Results

#### 3.1 Age-Related Differences

We defined the size of the vowel space area in each age group. Figure 2 shows how the vowels overlap across age groups.





**Figure 2.** The vowel space area in each age group.

We expected that with increasing age the overlap of the vowels would decrease. The data show that for most vowels the vowel spaces become smaller as age increases. This suggests that the articulatory gestures of children become more accurate as they grow older. To judge from the statistical analysis, there was a significant main effect of “age” on the F1 and F2 values (Table 3).

|      | F1      |      |          | F2     |      |          |
|------|---------|------|----------|--------|------|----------|
|      | F       | p    | $\eta^2$ | F      | p    | $\eta^2$ |
| [ɔ]  | 1446.34 | 0.00 | 0.576    | 276.41 | 0.00 | .206     |
| [a:] | 707.45  | 0.00 | 0.594    | 275.29 | 0.00 | .363     |
| [ε]  | 1960.40 | 0.00 | 0.615    | 569.75 | 0.00 | .317     |
| [e:] | 683.16  | 0.00 | 0.632    | 141.20 | 0.00 | .263     |
| [i]  | 589.67  | 0.00 | 0.475    | 249.78 | 0.00 | .278     |
| [o]  | 938.85  | 0.00 | 0.563    | 155.33 | 0.00 | .176     |
| [ø]  | 314.84  | 0.00 | 0.660    | 65.60  | 0.00 | .288     |
| [u]  | 141.21  | 0.00 | 0.421    | 48.51  | 0.00 | .200     |
| [y]  | 52.34   | 0.00 | 0.419    | 26.54  | 0.00 | .268     |

**Table 3.** Significant main effect of “age” on F1 and F2 in the case of all vowels.

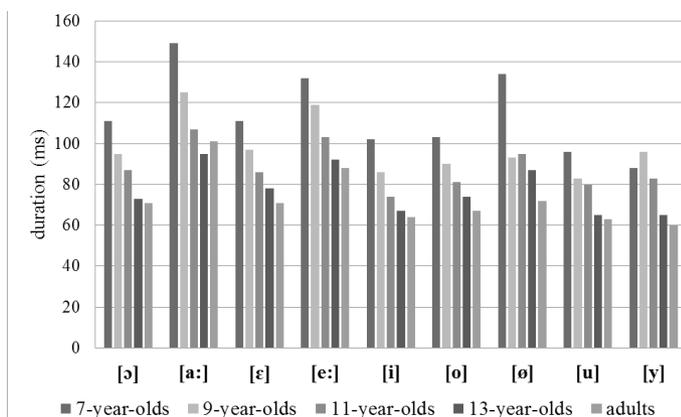
We compared the children’s data to adults’ data obtained from the literature (see Gráczí and Horvath 2010). Table 4 summarizes the average F1 and F2 values of 7-, 9-, 11-, and 13-year-olds and adults.

|      | 7-year-olds |      | 9-year-olds |      | 11-year-olds |      | 13-year-olds |      | adults |      |
|------|-------------|------|-------------|------|--------------|------|--------------|------|--------|------|
|      | F1          | F2   | F1          | F2   | F1           | F2   | F1           | F2   | F1     | F2   |
| [ɔ]  | 758         | 1572 | 753         | 1666 | 707          | 1590 | 649          | 1548 | 602    | 1568 |
| [a:] | 881         | 1768 | 897         | 1849 | 834          | 1836 | 757          | 1774 | 709    | 1863 |
| [ɛ]  | 778         | 1896 | 770         | 1910 | 722          | 1941 | 631          | 1889 | 600    | 1926 |
| [e:] | 563         | 2271 | 544         | 2164 | 537          | 2282 | 484          | 2274 | 466    | 2269 |
| [i]  | 517         | 2088 | 526         | 2102 | 484          | 2294 | 434          | 2302 | 414    | 2348 |
| [o]  | 635         | 1426 | 646         | 1528 | 597          | 1433 | 581          | 1440 | 495    | 1398 |
| [ø]  | 622         | 1812 | 633         | 1889 | 592          | 1801 | 535          | 1760 | 489    | 1770 |
| [u]  | 527         | 1458 | 509         | 1616 | 491          | 1566 | 459          | 1609 | 329    | 1242 |
| [y]  | 516         | 1878 | 519         | 1917 | 459          | 1940 | 446          | 1955 | 408    | 1739 |

**Table 4.** Mean values of first and second formants (Hz) of Hungarian vowels across ages (adults' data: Grácz and Horváth 2010).

On the basis of the mean values of the first two formants we assume that the 9-year-olds' vowel articulation in spontaneous speech is closer to that of the 7-year-olds than to that of older children. However, the 13-year-olds' vowel articulation seems to be unambiguously similar to that of adults. With an increase in age F1 values become lower, but F2 values do not change.

Previous studies reported that the speech and articulation rates of children are slower than adults', and that children's speech rate increases with age (Walker et al. 1992; Deme 2012). The average duration of each vowel decreases as age increases as a result of this acceleration of speech and the articulation rate (Figure 3). As expected, the longest vowel is [a:] in each age group, while the shortest is [y]. There is greater change in vowel duration between the ages of 7 and 9, and between the ages of 11 and 13. By the age of 13 the duration of each vowel becomes similar to that of adults.



**Figure 3.** Mean vowel duration across age groups (adult data: Gósy and Beke 2010; Bóna 2014).

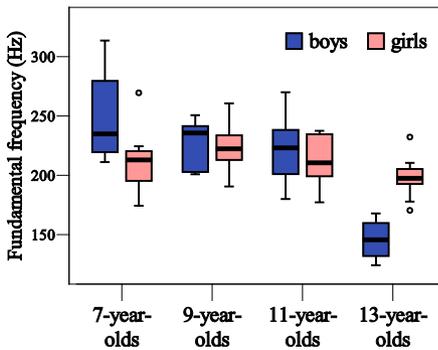
The effect of age on the duration of each vowel was significant. Table 5 demonstrates the statistical results.

|      | F      | p    | $\eta^2$ |
|------|--------|------|----------|
| [ɔ]  | 67.627 | 0.00 | 0.06     |
| [a:] | 83.718 | 0.00 | 0.147    |
| [ɛ]  | 87.375 | 0.00 | 0.067    |
| [e:] | 33.673 | 0.00 | 0.078    |
| [i]  | 56.293 | 0.00 | 0.08     |
| [o]  | 55.03  | 0.00 | 0.07     |
| [ø]  | 16.706 | 0.00 | 0.093    |
| [u]  | 17.82  | 0.00 | 0.084    |
| [y]  | 7.787  | 0.00 | 0.097    |

**Table 5.** Significant main effect of age on vowel duration.

### 3.2 Gender-Related Differences

We analyzed the fundamental frequency in boys and girls at the ages of 7, 9, 11, and 13. Figure 4 shows the results of the F0 measurements in boys and girls across age groups.

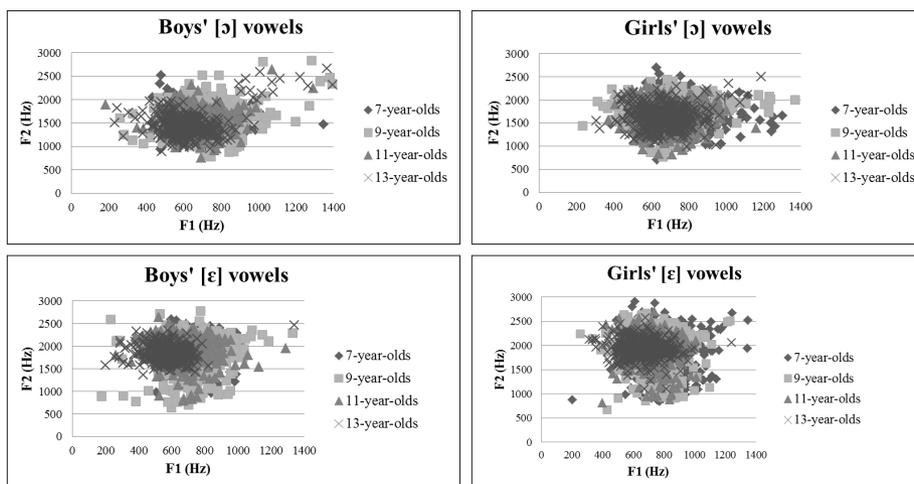


**Figure 4.** F0 (Hz) of children's speech.

On the basis of the results we can claim that at the age of 7 the fundamental frequency of boys is higher than that of the girls. This difference disappears at the ages of 9 and 11; in these cases the F0 of boys and girls is largely the same. By the age of 13 the F0 of boys becomes lower than that of girls. This visual impression was confirmed by statistical analysis; there was a significant main effect of “gender” at the age of 7 [ $F = 6.793$ ;  $p = 0.018$ ;  $\eta^2 = 0.274$ ] and 13 [ $F = 25.220$ ;  $p < 0.001$ ;  $\eta^2 = 0.677$ ]. The effect of

“age” was significant both in boys [ $F = 13.134$ ;  $p < 0.001$ ;  $\eta^2 = 0.568$ ] and in girls: [ $F = 2.585$ ;  $p < 0.001$ ;  $\eta^2 = 0.177$ ]. The interaction of “age” and “gender” is also significant [ $F = 8.179$ ;  $p < 0.001$ ;  $\eta^2 = 0.271$ ].

Figure 5 shows the spectacular change in the F1 and F2 values of [ɔ] and [ɛ] (the two most frequent vowels) with age in boys and girls. This shows that the area of the vowel space gets smaller with age both in boys and in girls. By the age of 13 the data are less scattered, irrespective of gender, which suggests that the articulatory gestures have become more accurate.



**Figure 5.** F1 and F2 values of [ɔ] and [ɛ] in boys and girls across ages.

We analyzed which parameters show significant differences between boys and girls across ages (Table 6). On the basis of the data we can claim that—as the F0 values also showed—there are less significant differences between the parameters of speech in boys and girls at the age of 9 and 11. There are no significant differences between boys and girls concerning vowel duration at the ages of 7, 9, and 11. However, in 13-year-olds there are significant differences depending on gender for each parameter.

|              | F1                                | F2                                | duration                         |
|--------------|-----------------------------------|-----------------------------------|----------------------------------|
| 7-year-olds  | [ɔ], [a:], [ɛ],<br>[e:], [o], [ø] | [ɛ], [i]                          | –                                |
| 9-year-olds  | [ɔ]                               | [ɛ], [i]                          | –                                |
| 11-year-olds | [ɛ], [ø], [y]                     | –                                 | –                                |
| 13-year-olds | [ɔ], [a:], [ɛ],<br>[e:], [ø]      | [ɔ], [a:], [ɛ],<br>[e:], [i], [ø] | [ɔ], [a:], [ɛ],<br>[o], [ø], [u] |

**Table 6.** Significant differences between boys and girls.

## 4. Discussion and Conclusion

The aim of this study was to gain an insight into the stabilization process of the formant structure of vowels in Hungarian-speaking children. The results confirmed that there were major individual differences in the articulatory gestures of the vowels, irrespective of age and gender. However, there was evidence of maturation in fundamental frequency and vowel duration across ages and gender. With age the duration of vowels becomes statistically shorter and vowel spaces get smaller. The most important gender-related difference is that the F0 of boys is higher at the age of 7, becomes similar to girls' at the age of 9 and 11, and then is lower by the age of 13.

Our first hypothesis, that there would be significant differences between boys and girls in every age group in the case of the F1 and F2 values, was not supported by our data. At the ages of 9 and 11 there were significant differences between boys and girls only in some vowels. Nevertheless, by the age of 13 gender is clearly identifiable by the F1 and F2 values and the duration of the vowels. From the F1 values we can conclude that there is greater articulatory change in the vertical movement of the tongue.

Our second hypothesis, that the formant structures of the 13-year-old children's vowels would converge to those of adults, was partly supported. The data showed that the vowels pronounced by 11-year-old children are still different from those of adults, while their articulatory gestures become similar to those of adults at the age of 13. We assume that the vowel stabilization process continues after the age of 13. We found the same tendency in the change of vowel duration. Over time, children become more proficient in their speech, so their data become more like those of adults. But even at later stages of language acquisition the differences between the articulation of children and adults are significant. Our data also confirmed the literature in that the formants of children are higher than those of adults.

Our third hypothesis (F0 will become lower in boys' than in girls' speech at the age of 13) was supported by the data, although there were already significant differences between boys and girls at the age of seven. Interestingly, the seven-year-old boys' F0 values were higher than those of the girls. While the F0 of girls barely changes—as

several previous studies found—we can notice a larger shift in the F0 of boys. This difference could be explained by the physiological changes (development and maturation of the vocal apparatus).

The results of our research help to describe the acoustic-phonetic features of vowels of typically developing children, and can be used in diagnostic procedures for speech disorders.

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# Modeling Accentual Phrase Intonation in Slovak and Hungarian

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**Abstract:** According to Jun and Fletcher (2014), languages with fixed lexical stress towards the edge of the word often include accentual phrases (AP) as a structural prosodic unit between the Prosodic Word (PrWd) and the Intermediate Phrase (ip). APs also tend to show a stable recurrent F0 pattern in various contexts. Slovak and Hungarian both have fixed word-initial lexical stress, and we test the hypothesis that APs are consistently marked with stable F0 contours, which is a precondition for their relevance in the intonational phonologies of the two languages. We employ linear and second-order polynomial stylizations of F0 throughout putative APs and intonation phrases (IPs) in a corpus of spontaneous utterances in Slovak and Hungarian from collaborative dialogues. The results show that these putative APs have consistent F0 contour patterns that are differentiated from the IP pattern in both languages: the Hungarian ones fall, while the Slovak ones rise before they fall.

**Keywords:** intonational phonology; accentual phrase; Slovak; Hungarian.

## 1. Introduction

### 1.1 Prosodic Phrasing

The intonational phonology of a language can be broadly characterized by a systematic relationship between the form and function in three fundamental domains: the division of continuous speech into prosodic units, the distribution of prominences within these units, and the type of F0 movement in the vicinity of the prominences and unit boundaries. This is because the prosodic contrasts in these three domains participate in cuing

syntactic, semantic, pragmatic, discourse, and other systematic functional contrasts. Take, for example, the first domain of prosodic phrasing. Virtually any utterance in conversational speech with multiple words might be produced (and perceived) with several optional phrasings. For example, Hirschberg (2002) lists several examples in which the presence vs. absence of a prosodic boundary (or, alternatively, its strength) may disambiguate or affect the syntactic/semantic parsing of an utterance. The scope of the negation in (1) and the attachment of the prepositional phrase in (2) are affected in such a way that in (1) the presence of a boundary facilitates the narrow scope reading of negation (“Bill’s unhappiness has led him not to drink.”) over the wide scope reading (“Bill does drink but not because of his unhappiness.”), and the boundary in (2) facilitates the high attachment of PP *with a telescope* to the verb *saw* (“Sally had a telescope.”) over the low attachment to the NP *man* (“The man had a telescope.”).

(1) Bill doesn’t drink (#) because he’s unhappy.

(2) Sally saw a man (#) with a telescope.

Several systematic observations of the relationship between the presence and type of a prosodic boundary on the one hand and the morphological, syntactic, and phonological structure on the other hand lead to the proposal of Prosodic Hierarchy (Selkirk 1986; Nespor and Vogel 1986; Beckman and Pierrehumbert 1986). There have been several additional layers (utterance, foot, mora) and names for the layers introduced (e.g., Prosodic Word  $\approx$  phonological word, intermediate phrase  $\approx$  minor phrase), and thus the hierarchy in (3) represents a schematic simplified version that is relevant for this paper. The fundamental idea, irrespective of the actual names and the number of layers, is extremely fruitful: Prosodic Hierarchy is the source of domains for the application of segmental processes (e.g., flapping in American English), the realization of intonational contours (e.g., pitch range reset), and their interaction (e.g., pre-final lengthening).

(3) Schematic (Simplified) Prosodic Hierarchy

- Intonational Phrase (IP)
- Intermediate Phrase (ip)
- **Accentual Phrase (AP)**
- Prosodic Word (PrWd)
- Syllable (Syl)

The outer levels of the hierarchy (Syllable and Intonational Phrase) are universal and appear in all languages and there is general agreement on their definition. Despite some linkage between the remaining prosodic domains and their correspondence to phonology/

morphology/syntax/semantics, these “inner” domains are less clearly understood. In this paper we focus on Accentual Phrases (APs). They have phrasal stress at the beginning or the end and are often found in languages with fixed word stress and seldom in languages with variable lexical stress (e.g., Farsi). Additionally, the pitch contours in APs show a regular pattern: rising, falling, or rising-falling (Jun and Fletcher 2014). Nevertheless, the definition of an AP is not unproblematic. For example, Jun and Fletcher (2014, 12), describing the difference between an AP and ip, state that durationally, APs “can have minor or no phrase final lengthening. An ip typically includes a few words or APs and is the domain of pitch reset, though not always marked by a boundary tone, and has a medium degree of phrase-final lengthening (i.e., weaker than IP-final lengthening).” The meaning of “weak,” “medium,” and “minor” in this description requires further clarification.

In addition to this complex, and at times vague, relationship between a phonological construct such as the AP and its phonetic realization, this domain might be susceptible to “low” and seemingly non-structural effects such as the number of constituents within a domain. For example, Jun and Fougeron (2002, 24) observe that in French, “when an AP is longer than six syllables and contains two content words, the string will be produced in two APs with each content word forming one AP.” And Frola and Vigário (2007) observe that prosodic length in terms of the number of syllables affects the placement of AP boundaries in Standard European Portuguese.

One of our goals in this paper is to add to the understanding of APs within the Prosodic Hierarchy by investigating the prosodic phrasing of Slovak and Hungarian, two languages whose characteristics facilitate the relevance of APs for their intonational phonologies.

## 1.2 Slovak and Hungarian

Slovak and Hungarian are genetically unrelated languages that, however, are geographical neighbors and have a long history of contact and mutual influence. Slovak is a West Slavic language with about five million speakers in Slovakia and Hungarian is a Finno-Ugric language with about 10 million speakers in Hungary and significant minorities in Slovakia, Romania, and other neighboring countries. They share several prosodic characteristics, most importantly the fixed position of lexical word stress on the left-most syllable of a Prosodic Word and very weak and often variable tendencies for secondary stress. Additionally, the left-most primary stress is marked with relatively weak phonetic cues such as minimal vowel quality difference between stressed and unstressed syllables (Beňuš and Mády 2010), weak durational cuing of the stressed syllables, partly as a result of the phonemic contrast in vowel duration in both languages, and the absence of clear robust marking of word stress with intensity and F0.

Regarding prosodic phrasing, initial efforts at building a ToBI system for Slovak prosody do not propose units below intermediate phrases (Rusko et al. 2007). On the other hand, previous work on Hungarian suggests that content words are produced with pitch accents that delimit the left edge of a smaller prosodic domain within larger

intonational phrases. Hunyadi (2002) refers to this domain as a phonological phrase and Varga (2002) defines this domain intonationally with a set of “character contours.” Given the description of APs in other languages by Jun and Fletcher (2014) discussed in Section 1.1 above (edge-most phrasal stress and regular characteristic F0 contours), this prosodic domain of Hungarian might correspond to APs.

### 1.3 Approach: From Accent Groups (AGs) to Accentual Phrases (APs)

The overall goal of our research is to determine if the intonational phonology of Slovak and Hungarian utilizes the prosodic domain between the Prosodic Word and Intermediate Phrase. There are two steps to reaching this goal. First, we have to establish if speakers consistently produce this prosodic domain with systematic prosodic marking. Second, we have to test if the presence of this prosodic domain is systematically linked to some linguistic contrasts in both production and perception of speech. The current paper tests the first step, and, to preview, provides a positive answer for both languages. The second step is the topic of our future research.

To answer the question in the first step, we take a bottom-up approach. Given that the guidelines for identifying intermediate and accentual phrases top-down are tentative and often rely on intuition, we define an accent group (AG) as a rhythmic unit that stretches from an accented syllable until the last unaccented syllable before the next accent or the end of the IP. There are several studies suggesting high inter-annotator agreement and reliability in the task of identifying pitch-accented syllables (see Wightman [2002] for a review). Once the accents are marked, we then test if the AGs are consistently characterized by a given type of F0 contours. If the answer is positive, the AGs would fulfill both criteria for Accent Phrases (APs) listed in Jun and Fletcher (2014): edge-prominence (left-most in both Slovak and Hungarian) and a consistent shape of the F0 contour. We first review the results based on comparing AG contour deviance from overall IP contours through linear stylization of F0 presented in Mády et al. (2014) and then extend the results by employing F0 stylization with second-order polynomials.

## 2. Methodology

### 2.1 Corpus

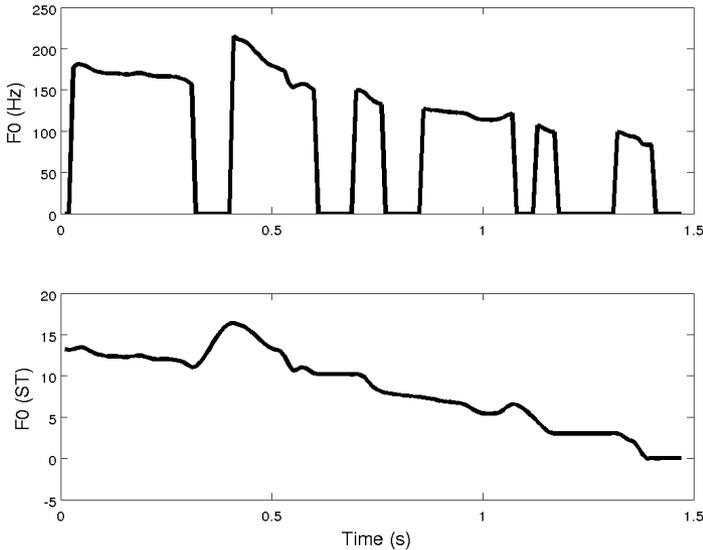
We performed a random selection of spontaneous utterances in Slovak and Hungarian that formed a single Intonational Phrase (IP) from corpora of Slovak and Hungarian collaborative dialogues. There were three requirements for these IPs. First, they had to have at least two pitch accents to guarantee that the Accent Groups (AGs), defined bottom-up as a rhythmic unit spanning the accented syllable and all the following unaccented syllables, do not correspond to IPs. Second, to assure the consistency of the data and to make the F0 stylization robust, only IPs with a low phrase-final boundary tone were allowed. Finally, to achieve a representative sample and good coverage of the variations between speakers, we selected

five utterances each from 10 Slovak and 10 Hungarian speakers, respectively. Both IPs and pitch accents were identified manually by a phonetically trained native speaker (Štefan Beňuš and Katalin Mády) on the basis of audible and visible pitch movements in the signal and perceived prominence on the word. This procedure gave us 50 Slovak IPs containing 157 AGs and 50 Hungarian IPs containing 130 accent groups as the corpus for this study.

## 2.2 F0 Stylization and Measures

### 2.2.1 Pre-processing

F0 was extracted by autocorrelation (Praat 5.3, sample rate 100 Hz). Voiceless parts of the utterances and F0 outliers were interpolated by piecewise cubic splines (de Boor 1978). The contour was then smoothed by Savitzky-Golay filtering (Savitzky and Golay 1964) using third-order polynomials in five sample windows and transformed to semitones relative to a base value. This base value was set to the F0 median below the fifth percentile of an utterance and served to normalize F0 with respect to its overall level. Figure 1 illustrates the result of this pre-processing.



**Figure 1.** Pre-processing example.

### 2.2.2 Linear Stylization: Quantifying Deviation between Accent Groups and Intonational Phrases

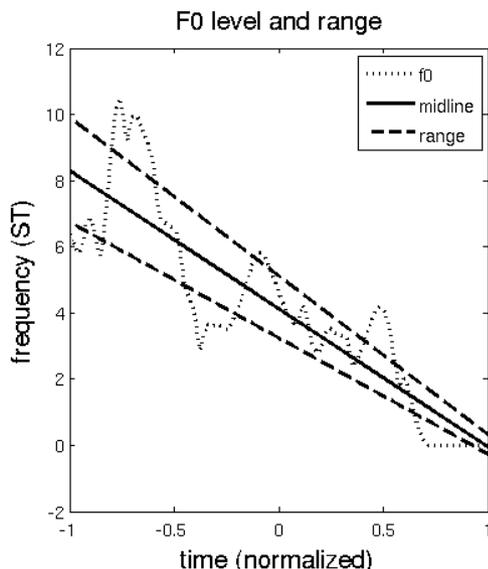
We assume that the F0 correlates for the presence of accentual phrases are: (1) local-level deviations between AGs and the IP and (2) prominent F0 movements within AGs expressed in high F0 ranges. In order to quantify these two aspects we first carried out

a linear level and range stylization within the IPs and AGs and then calculated the distance between the AG and IP stylization parameters.

To capture the F0 register in terms of its level and range (Rietveld and Vermillion 2003) we fitted a base-, a mid-, and a topline separately for the IP and all the AGs within this IP. The midline represents the F0 level, whereas the base- and topline provide the F0 range information. The robust fitting procedure, which is explained in more detail in Reichel and Mády (2013), consists of the following steps:

- A window with a length of 200 ms is shifted along the F0 vector with a step size of 10 ms;
- within each window three F0 medians are calculated: one for the baseline based on the values below the 10th percentile, one for the topline based on the values above the 90th percentile, and one for the midline based on all the values;
- within each of the three resulting median sequences outliers are replaced by linear interpolation and a linear polynomial is fitted.

It is shown in Reichel and Mády (2014) that this approach is more robust for base- and topline fitting than the classical fitting approach of Liebermann et al. (1985) since it does not need to rely on the detection of noisy peaks and valleys. An example result of this linearization approach is shown in Figure 2.



**Figure 2.** Linear level and range stylization. The level course is represented by the midline, the range course by the time-varying distance between the base- and topline.

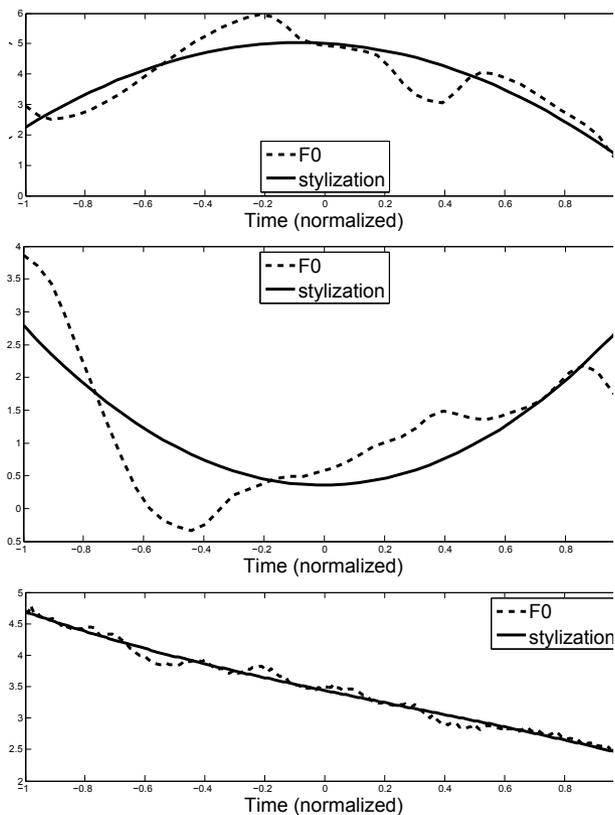
From these mathematical representations of F0 contours, the following measures were derived:

- the slope of the AG midline (*mlSlope*);
- the absolute slope difference of the AG and IP midlines (*mlSlopeDiff*);
- the mean squared deviation of the AG line from the corresponding section of the IP line (*mlRms*);
- the absolute value of the difference between the initial F0 value of the AG midline and the corresponding IP midline value (*mlInitDiff*);
- the absolute value of the difference between the final F0 value of the AG midline and the corresponding IP midline value (*mlFinDiff*);
- the AG range is represented by the root mean squared deviation between the AG top- and baseline (*rangeRms*).

The expected acoustic correlates for the presence of accentual phrases are prominent F0 movements reflected in high AG range values (*rangeRms*), as well as considerable local-level deviations between the AG and the IP expressed in high values for the features *mlSlopeDiff*, *mlRms*, *mlInitYDiff*, and *mlFinYDiff*. To test the null hypothesis (that AGs do not differ significantly from IPs with respect to the F0 parameters that were investigated), we used a one-sample t-test for the features and compared it to a sample with mean = 0. A significant difference would point to a difference in the AG and IP marking for a language. To test the hypothesis that Slovak and Hungarian differ in their marking of AGs, we compared the Hungarian and Slovak samples to each other. If the data were not normally distributed, the Mann-Whitney test was carried out instead. The equality of variances was tested by the Levene test, which is also applicable to non-normally distributed data. The significance level was set to  $p = 0.05$ .

### 2.2.3 Quadratic Stylization: F0 Shape in Accent Groups

Within each AG a second-order polynomial was fitted to the F0 contour. In order to compare the parameters across different AG lengths, the time was normalized to the interval  $-1$  to  $1$ . The curvature of the F0 contour was quantified in terms of the quadratic coefficient. Negative values represent concave (rising-falling), as in the left-hand panel of Figure 3, positive values convex (falling-rising) shapes, as in the middle panel of Figure 3, and a value near zero indicates a low curvature and thus a contour with an almost linear shape, as in the right-hand panel of Figure 3.



**Figure 3.** Examples of quadratic stylization: typical Slovak rising-falling contour (top); typical Hungarian falling-rising or falling contours (middle, bottom).

Linear and parabolic shapes were furthermore distinguished by locating the peak or valley of the fitted parabola. By definition, for linear shapes the turning point is located outside the AG time interval, whereas for parabolic shapes it is inside this interval.

### 3. Results

#### 3.1 Linear Measures

This section summarizes the patterns observed in the analysis of linear stylization. Compared to Mády et al. (2014), in which detailed information, figures, and statistical results on these data are described, here we used a more conservative method for eliminating outliers. All the major patterns remained but we report less robust findings concerning the local differences between the AG and the IP at the beginning and at the end of the AG.

The midline slopes (*mISlope*) were more often negative (= falling) in Hungarian than in Slovak, and the fall was steeper than in Slovak. The measures *mISlopeDiff* and *mIRms* indicate to what extent the AG midlines deviate from the IP midlines. While the first parameter defines the angle of the two midlines, the second gives the distance between the two. If two midlines are parallel but distant, *mISlopeDiff* is zero, while *mIRms* is large. The analysis revealed that the AG midline slopes differ considerably from the IP midlines in both languages (i.e., the differences differed significantly from zero). The slope differences were significantly larger in Hungarian than in Slovak.

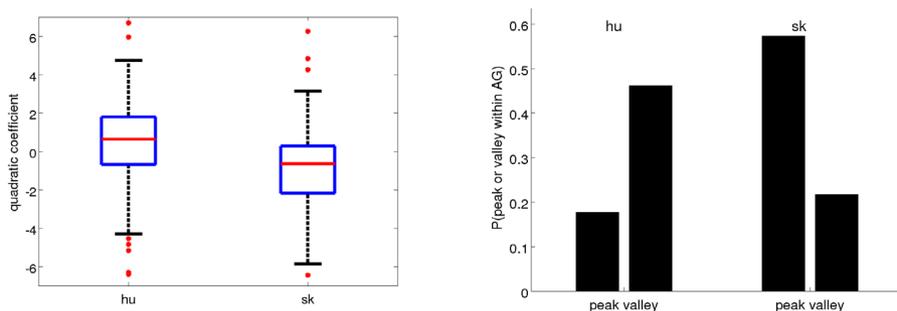
The measures *mIInitYDiff* and *mIFinYDiff* are measures of the local differences in the AG vs. the IP at the beginning and at the end of the AG. Since the measure contains the absolute difference between the onset/offset of the AG and the IP, a larger value refers to a greater deviation. There was only one significant result: *mIInitYDiff* differed significantly from zero in Hungarian. In other words, AGs begin with a different F0 in Hungarian than would be predicted on the basis of the IP. Note, however, that these measures express the absolute difference and do not provide information about the direction of this difference.

Finally, the ranges between the base- and the topline were compared. It was assumed that if an AG is an independent prosodic unit in its own right, then it will have a larger range in the domain of the AG than would be expected on the basis of the corresponding part of the IP. This expectation was confirmed for both languages with values considerably higher than zero. However, no difference between Hungarian and Slovak was found.

The above results showed that Hungarian AG slopes tend to be falling, and that they differ from the overall midline slope of the entire IP. These tendencies were also present in Slovak, but to a smaller extent.

### 3.2 Quadratic Measures

The AG contours were analyzed on the basis of the coefficient  $c_2$ , representing the curvature of the polynomial functions that best fitted these contours. It should be recalled from Section 2.2.3 that negative coefficients indicate a rising-falling F0 pattern (the higher the absolute value of  $c_2$ , the more pronounced the rise-fall), positive coefficients indicate a falling-rising contour, and values around zero show a low curvature, i.e., a close approximation of a linear shape. The values for the quadratic coefficient  $c_2$  are shown in the left-hand panel of Figure 4 and the difference between the languages is highly significant. The majority of the Hungarian contours had a flat or falling-rising pattern, whereas the F0 contours in the Slovak AGs were typically rising-falling and steeper than in Hungarian.



**Figure 4.** Values of  $c_2$  in Hungarian (*hu*) and Slovak (*sk*) for polynomials fitting F0 contours within AGs (left), and probabilities that the peak or valley of a parabola is located within the corresponding AG (right).

Given that the F0 midlines in the Hungarian AGs were previously shown to be falling, it is interesting that about one third of the quadratic coefficients was negative in Hungarian. One possibility is that a falling F0 contour is stylized as the falling part of a parabola, and the peak is located to the left of the midpoint of the AG, or even preceding the onset of the AG.

The location of the peaks of all the concave parabolas, i.e., those with negative  $c_2$ , and the valleys of the convex ones, i.e., those with positive  $c_2$ , was algorithmically identified in the data. On the basis of a chi-square test, we found that the relative frequency  $P$  with which a polynomial peak or valley fell within the range of the AG was significantly higher for Slovak than for Hungarian ( $P = 0.79$  for Slovak,  $P = 0.64$  for Hungarian,  $X^2 = 8.1204$ ,  $p = 0.0044$ ), which indicates that the Slovak AG contours were less linear and showed a more pronounced curvature. Besides, significantly more Slovak AGs contained a polynomial F0 peak ( $P = 0.57$  for Slovak,  $P = 0.18$  for Hungarian,  $X^2 = 46.7952$ ,  $p < 0.0001$ ). The right-hand panel of Figure 4 shows these relative probabilities. While in Hungarian, valleys rather than peaks are likely to occur in AG-medial position, the situation is reversed for Slovak: peaks but not valleys are likely to occur within the AG. Hence, the analysis of the quadratic measures shows that the dominant contour in the Slovak AGs is a rise-fall, while it is a fall (or fall-rise) in the Hungarian AGs.

## 4. Discussion and Conclusions

The goal of the paper was to determine if Slovak and Hungarian speakers consistently mark a prosodic domain between the syllable and the intermediate phrase with stable F0 contours. Our approach relied on the robust bottom-up creation of a rhythmic unit we called the Accent Group (AG), spanning the initial accented syllable up to the next accent or end of an intonational phrase (IP). AGs are by definition edge-marked since

lexical stress in both Slovak and Hungarian is on the initial syllable of a Prosodic Word. The question we set out to answer was if AGs are produced with a consistent F0 contour pattern that is different from the overall contour for the entire IP. The measurements based on the linear stylization of AG and IP contours suggested that AG contours are typically falling in Hungarian and clearly different from IP contours, whereas in Slovak this tendency was much weaker.

The innovative extension of this finding in this paper is the pattern in the quadratic stylization of AG contours. The values for the quadratic coefficient  $c_2$  show that Slovak AG contours are predominantly rising-falling, which explains the weak effect observed for the linear-based measures in the Slovak data. Moreover, the maxima of these Slovak concave contours (F0 peaks) are frequently contained within the time interval of the AG. On the other hand, the quadratic fitting of the Hungarian AG contours points to a much less homogeneous pattern compared to Slovak. To summarize, AGs have consistent F0 contour patterns that are differentiated from the IP pattern in both languages: the Hungarian ones fall, while the Slovak ones rise before they fall. Therefore, both Slovak and Hungarian AGs are good candidates for the Accent Phrase (AP) as a prosodic domain of the intonational phonology of the respective languages.

In the absence of the data for the second step of our approach to determining the relevance of APs for the intonational phonologies of Slovak and Hungarian (systematic linguistic contrast marked by AP boundaries; Section 1.3), we point out that one of the functions of the putative AP boundaries is to enhance the perception of emphasis on the following word. As discussed in Section 1.2, both languages have relatively weak phonetic marking of accents on lexically stressed syllables. It is plausible that there is a cross-linguistic trade-off in marking prominence: some languages, such as English, use large pitch changes in the vicinity of accented syllables accompanied by increases in duration and intensity, whereas other languages use weaker cues on the accented syllables themselves but insert a prosodic boundary to enhance the perception of prominence on the material following this boundary.

This idea might explain our informal observation that speakers not familiar with Slovak or Hungarian commonly have difficulty perceiving the word-initial prominence and that native speakers tend to insert salient breaks, even pauses, at syntactically weak junctures, such as between a determiner and a noun, which, however, would be legitimate AP boundaries (Mády and Kleber 2010). In this sense, our observations are similar to the suggestion of Wagner and Malisz (2012) after examining the effects of intensity, pitch movement, and duration on Polish word stress and sentence prominence that fixed penultimate word stress is a highly influential “expectation” perceived by native speakers but not consistently signaled in the acoustic signal. We suggest that this consistency might be found globally in larger prosodic domains rather than locally on the accented syllables.

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# F0-Peak Realization in Lombard Speech

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**Abstract:** Hyper-speech is commonly characterized by strategies that improve signal-to-noise ratio and intelligibility such as greater overall intensity, F0 range, temporal lengthening, and others. All these phenomena may be brought about by the Lombard effect when people communicate in noisy environment, or with people who have hearing problems, but hyper-speech may also be employed when communicating in a language in which the interlocutor has low proficiency. Analyzing strategies underlying adjustments in hyper-speech improves our understanding of the cognitive linguistic system. In this paper we explore the realization of F0 peaks in hyper-speech caused by increasing levels of babble noise channeled to subject's ears and the presence of a non-native interlocutor. Data consist of single speaker's renditions of an identical clause produced in 6 blocks of dB(A) SPL babble noise: two blocks of 60dB, one block with 70dB, two blocks with 80dB noise, with the second one simulating communication with a non-native interlocutor who was present and visually interacted with the subject, and a reference condition with no noise. We put forward several methodological approaches as well as some preliminary results testing the dimensionality of strategies speakers have at their disposal when the communicative need for hyper-speech arises. Our goal is to inform subsequent formal modeling of the relationship between prosody and hyper-articulation.

**Keywords:** Lombard speech; prosody; Slovak.

## 1. Introduction

Most speech is produced in noisy surroundings. Analyzing speech elicited in noise helps us understand how language use relates to linguistic structure: we learn about

the cognitive system underlying speech by understanding the adjustments it makes to cope with sub-optimal conditions. Lombard speech is an umbrella term for adjustments that people (and some other animals) make when they communicate in noisy environment (Lombard 1911; Brumm and Zollinger 2011). Speaking against background noise is most commonly associated with an increase in overall intensity, greater F0 range, temporal lengthening, flattening of spectral slope, greater center of gravity, and others, generally assumed to facilitate speech intelligibility by increasing signal-to-noise ratio (see, e.g., Van Summers et al. 1988). In short, the resulting production can be characterized as “hyper-speech”—people simply speak up.

Many studies suggest that the Lombard effect is both a speaker-oriented automatic process that results from attenuated feedback from the speaker’s own voice, as well as a listener-oriented cognitive process under the control of a speaker who strives to increase intelligibility for the interlocutor (e.g., Lu and Cooke 2010; Garnier et al. 2010). Evidence for automatic adjustments of vocal communication due to attenuated feedback comes from studies showing that many mammals and birds display the effect (see Brumm and Zollinger [2011] for a review). Evidence for the listener-oriented aspects comes from studies showing that linguistic factors interact with the Lombard effect. For example, F0 and the duration of content words are affected by Lombard noise to a greater degree than F0 and the duration of function words (Patel and Shell 2008), and a greater Lombard effect was observed when talkers completed an interactive task with a partner than when carrying out a non-interactive task alone (Garnier et al. 2006). Additionally, speakers were also found to compensate, both in production and perception, for environmental conditions, for example in terms of both the noise level and the number of background talkers (Lu and Cooke 2009; 2010). Interestingly, in the communicative tasks of these studies, speakers were also able to purposefully lower the overlap between speech and background speech and thus increase signal-to-noise ratio through temporal adjustment; this could not be explained by passive slowing down or producing more pauses.

It is clear that Lombard speech affects the realization of intonational targets, but it is less clear if the observed differences arise from changes to the intonational phonological structure, e.g., by producing a different pitch accent when overcoming high levels of external noise, or changes in the phonetic realization of this underlying structure, or a combination of the two. For example, Vainio et al. (2012) report differential effects of noise on F0-focus realization. Welby (2006) discusses diverging results on the effect of noise on (phonological) F0-target alignment to segmental structure. One form of linguistically induced hyper-articulation is the prosodic marking of narrow or contrastive focus. In many languages, this type of focus is associated with a pronounced rise of F0, with the peak commonly aligned late or after the accented syllables. This contrasts with accented words in broad focus that are realized with less pronounced peaks, which tend to be aligned earlier in the accented

syllable. In the Tones and Break Indexes (ToBI) framework (Beckman et al. 2005), this difference corresponds to phonologically different pitch accents L+H\* and H\* respectively, as suggested by, e.g., Pierrehumbert and Hirschberg (1990). Previous studies have established that the Lombard effect includes an increase in F0 peaks and the duration of stressed syllables. Given the cognitive nature of the Lombard effect and its interaction with linguistic structure, it is plausible that strong Lombard noise might produce a similar effect as the realization of contrastive focus: pronounced F0 peaks that are aligned late, or after, the accented syllables. Hence, one aspect of the current work is to examine the effect of Lombard noise on the alignment of F0 peaks within the accented syllable.

The primary focus of this work then is the variation in the shape and temporal characteristics of F0 contours as a function of noise level. In addition, we compare the modifications resulting from the Lombard effect with adjustments related to the task of conveying information to a non-native speaker. It has been argued that the Lombard effect contributes to increased perceptual intelligibility of speech (Lu and Cooke 2009). Arguably, when speaking to a foreigner we can also be expected to aim at better intelligibility—simulating the interaction with a non-native speaker of a language has in fact been successfully employed as a method for eliciting hyper-articulation in prosodic research (Cho et al. 2011). The question is whether this intention is achieved by similar means, at least on the surface, as a largely reflexive way of increasing signal-to-noise ratio in a loud environment. In other words, what are speaker's options when aiming at more intelligible hyper-speech?

In this pilot study we put forward several methodological approaches as well as some preliminary results addressing these questions. We compare the extrema and the range of the F0 contour in Lombard and foreigner-directed speech, and evaluate the dynamics of F0 excursion during the production of a single target syllable. Also, we present durational characteristics and a simple measure of coordination between intonation and the syllable.

## 2. Methodology

As part of a larger study of the interaction between Lombard speech and prosodic structure, acoustic and articulatory data from repetitions of 12 Slovak stimuli utterances in blocks of various noise conditions were recorded. All 12 sentences started with an identical first clause *Rozdelil to . . .* ('He has divided it . . .') followed by material varying the strength of the prosodic boundary and the segmental environment in the vicinity of this boundary.

The stimuli were produced in seven blocks of dB(A) SPL babble noise: two blocks of 60 dB (referred to as 60-1, 60-2 conditions), one block with 70 dB (70), two blocks with 80 dB noise, with the second one simulating communication with a non-native interlocutor who was present and visually interacted with the subject (80, 80nn),

a reference condition with no headphones and no noise (0), and a block in which the subject was asked to speak in a relaxed, hypo-articulated speech (0r). In total, roughly 60 sentences (5 repetitions of 12 prompts) were produced for each block. The order of the condition blocks during data collection was as follows: 70, 80, 0, 0r, 60-1, 80nn, 60-2.

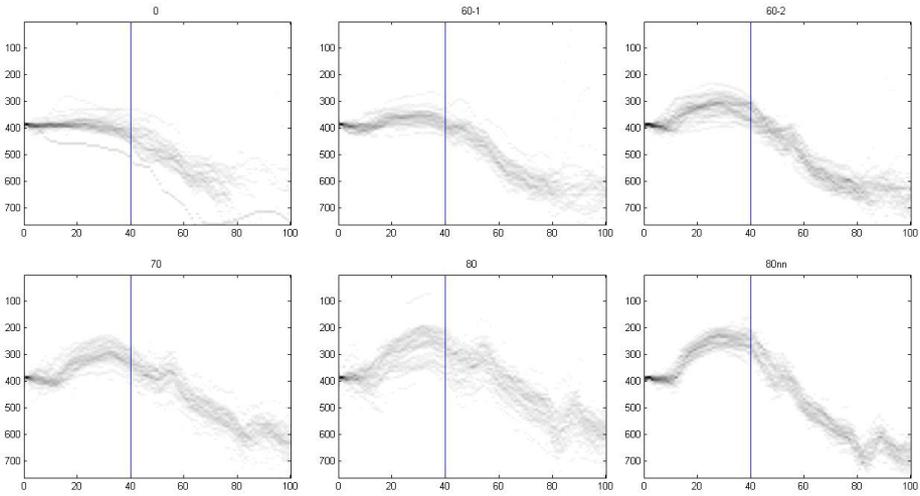
The present study analyzes a single speaker's acoustic data from the realization of the first clause *Rozdelil to*. Due to the corruption of acoustic data in the 0r condition we analyze 376 tokens divided roughly equally among the remaining 6 conditions. The target clause was invariably produced as a separate intonational phrase with an H-target (= ToBI's pitch accent) on the first syllable and an L-target (= ToBI's boundary tone) aligned with the end of the phrase.

As discussed in Section 1, we are interested in interplay of the first syllable duration, F0-peak scaling, and its alignment to the segmental material as production strategies for hyper-speech. Hence, the F0 contour was automatically extracted using Praat (Boersma and Weenink 2014) and manually corrected for spurious points. Utterances were also manually labeled for the acoustic onset and offset of /z/, the putative coda of the first syllable. Subsequently, the F0 maxima of the entire phrase and the F0 minima of the first syllable were automatically extracted with Praat together with their time points. Finally, we calculated the bounded variation norm (BVN) to capture the time-normalized movement of F0 in semitones. This is the sum of the absolute differences between the subsequent F0 points within a given time interval and approximates the first processing steps of pitch in the human brain stem (Vainio et al. 2012).

For a statistical analysis of the effect of noise condition on dependent variables, we use an ANOVA-based TukeyHSD multiple comparisons with adjusted p-values implemented in R. This is possible since we only analyze data from one subject and the segmental material in all conditions is identical. This method, however, is not ideal for the condition 80nn, which is different from all other conditions by the added communicative effect of non-native speaker presence. Therefore, to investigate the effect of this factor, we employ a simple t-test comparing the means for the 80 and 80nn conditions.

### 3. Results

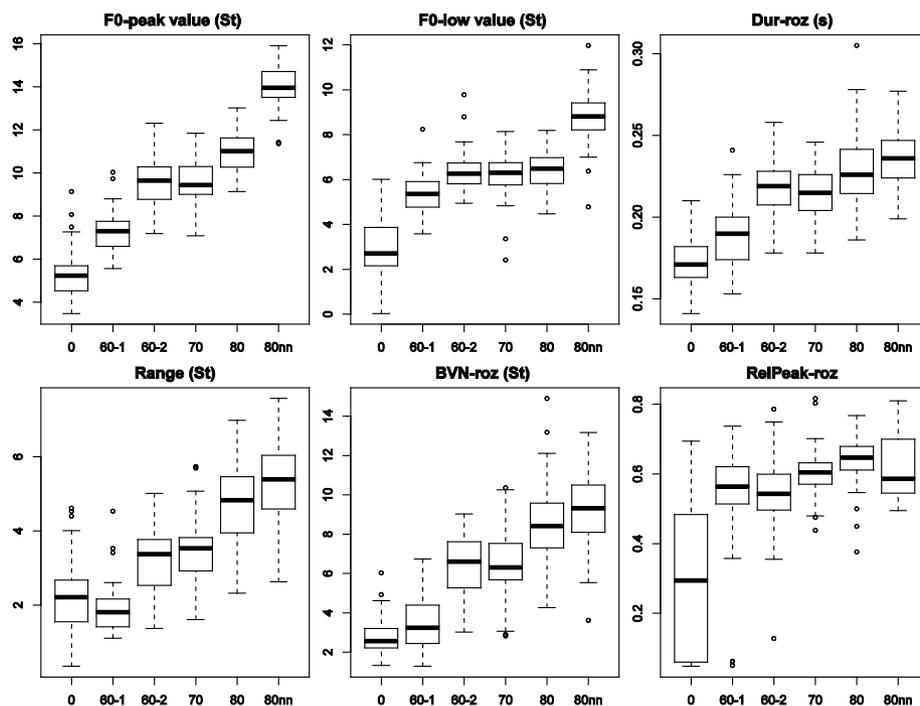
Figures 1 and 2 describe the data in a concise and expository way. Figure 1 shows the interpolated and normalized (both horizontally and vertically) F0 curves of *Rozdelil to* using the bit-map clustering method (Edlund et al. 2009). Additionally, the curves are aligned to the offset of /z/—the end of the first syllable—represented by the vertical line at 40 units of the x-axis. Hence, the first syllable is to the left of the vertical line and the remaining three syllables to the right of it. The noise condition is shown at the top of each sub-plot.



**Figure 1.** Normalized interpolated F0 curves separately for the noise conditions aligned to the z-offset (vertical line at 40) using the bit-map clustering method (Edlund et al. 2009).

Figure 2 shows boxplots of the dependent variables of interest from the first syllable divided by the noise conditions. In the top row, we see (from left to right) the value of F0 peak in semitones, the F0 minimum within the first syllable in semitones, and duration of the first syllable in seconds. In the bottom row, the leftmost plot shows the F0 range in semitones of the first syllable, the middle plot shows the values of the bounded variation norm calculated from the F0 contour in semitones within the first syllable, and the rightmost plot depicts the normalized F0-peak alignment within the first syllable using the formula in (1), where  $F0_{peakT}$  is the time of the F0 peak,  $startR$  is the beginning of the target syllable /roz/, and  $endZ$  is the end of the syllable. Hence, the normalized duration of the syllable ranges between 0 and 1, and the y-axis of the plot shows where the F0 peak occurs within this interval.

$$(1) \text{ RelPeak-roz} = (F0_{peakT} - startR) / (endZ - startR)$$



**Figure 2.** Boxplots of dependent variables divided by noise conditions, see the text for an explanation of the variables

We now discuss the patterns indicated by the figures, complemented by statistical analysis. Before we turn to real effects we point out one pseudo-effect stemming from the data collection design. Note the visible difference between conditions 60-1 and 60-2 in the boxplots of Figure 2, which is statistically significant for all but the bottom-right plot. At first glance this should be surprising, since the level of Lombard noise is identical in these two conditions. However, condition 60-1 followed condition 0r with the most relaxed (hypo-articulated) speech, while condition 60-2 followed condition 80nn with the most hyper-articulated speech. The difference is thus plausibly due to a carry-over effect, which is corroborated by the direction of the difference between the two 60 blocks: 60-2 is always closer to 80nn than 60-1.

Let us consider first the raw values of F0 maxima, minima and syllable duration in the top of Figure 2 and then the other three derived measures. The first real robust pattern is that, following our expectation, increasing the level of Lombard noise increases both the height of the F0 peak and the stressed syllable duration. For both variables, the differences among the five conditions (0, 60-1, 60-2, 70, 80) are robustly significant except the 60-2 vs. 70 pair. We assume that the non-significance of the difference can be attributed

to the order effect described above. For both variables, scaling is roughly linear with non-linear increase in the noise level. However, we also observe that the height of F0 peak is greatly affected by the communicative presence of a non-native speaker (80nn) while syllable duration is affected to a comparatively smaller degree. We thus see the first indication of a hyper-speech strategy employing an extra effort to communicate with a non-native speaker: pitch peak is increased to a greater extent than syllable duration.

The last raw variable of interest, the F0 minimum within the first syllable, follows a slightly different pattern. Here, in addition to the non-significance of the 60-2 vs. 70, attributed to the order effect, the condition of 80dB noise is also not different from the other two conditions while 80nn causes a sharp increase. Additionally, the difference between the 0 and 60-1 conditions is great ( $t > 12$ ) compared to other step-wise Lombard increases.

The two derived measures of F0 excursion—range and bounded variation norm (BVN)—show largely similar patterns with the non-significant difference for the 60-2 vs. 70 pair. Compared to other variables so far, surprisingly there is no statistically significant difference in the 0 vs. 60-1 pair ( $p = 0.061$  for F0 range and  $p = 0.122$  for BVN).

Finally, the normalized alignment of the F0 peak with respect to the first syllable shows yet a different pattern. From the five Lombard conditions (0, 60-1, 60-2, 70, 80), this variable shows a non-significant difference between 60-1 and 60-2, a very weak difference between these two and the 70 condition ( $p = 0.09$  and  $p = 0.041$  respectively), and no difference between 70 and 80 ( $p = 0.42$ ), although 80 is significantly different from the two 60 ones. Note that the reference condition 0 has huge variability and although it shows a significant difference from the other conditions, this is another pseudo-effect due to the absence of a clear F0 peak in this condition, also visible in the top left plot of Figure 1. Hence, compared to the other variables, peak alignment shows relative stability with respect to Lombard noise, despite robust changes to the peak value and syllable duration.

Let us turn now to the effect of communicating with a non-native speaker, that is, the difference between the 80 and 80nn conditions. Most strikingly, peak alignment shows the opposite pattern compared to other variables. While in the remaining 5 variables, 80nn continues with a general trend of increasing the measure value with increasing Lombard noise level, for peak alignment this pattern is reversed. Hence, in addition to robust increases from 80 to 80nn in the F0 peak and low values ( $|t| > 14$  in both cases), medial ones in syllable duration and F0 excursion ( $2.4 < |t| < 3.5$ ), the F0 peak is aligned *earlier* in the syllable in 80nn compared to 80. This is a weak but significant difference ( $t = 2.02$ ,  $p = 0.046$ ).

## 4. Discussion and Conclusion

The picture we can draw from this limited dataset (single phrase, single speaker) points to the complexity of the Lombard effect and three systematic patterns. First, and

following our expectation, we replicated earlier findings that increasing Lombard noise channeled to subject's ears produces hyper-speech, manifested in both stressed syllable duration and F0 peak and excursion values: the louder the noise, the longer the syllable, the higher the peak, and the greater the F0 excursion. Interestingly, the scaling of the F0 minimum within the stressed syllable, i.e., the start of the pitch rise, is much less robust than the scaling of the pitch maximum, and seems to produce two (non-linear) jumps: the first is the response to the simple presence of Lombard noise and wearing headphones (0 vs. 60-1), and the second—discussed in more detail below—is the presence of a non-native speaker (80 vs. 80nn). We saw that the difference of F0 maxima between 0 and 60-1 is not comparable with the robust difference of F0 minima, which resulted in a non-significant difference in this pair in both derived measures of F0 excursion (range and bounded variation norm). Once the Lombard noise is employed, however, the response to increasing levels of this noise is robust and regular.

The second pattern is the relative stability of F0-peak alignment to the segmental material in the 60-80 conditions. This result supports an analysis where the type of the pitch accent (i.e., a categorical phonological contrast between H\* and L+H\*) is *not* affected by the Lombard effect. This is because we did not observe a consistently later peak alignment for greater noise conditions, which is predicted if normal speech is realized with an H\* pitch accent and extremely hyper-articulated one with an L+H\* one. Additionally, F0-peak anchoring to the segmental material, assumed to be highly influenced by various phonetic and phonological factors, seems to be resistant to the Lombard effect. This adds a new dimension to the traditional division (e.g., Arvaniti 2012) that discrete phonological entities (e.g., pitch accents) associate with specific structural positions in a discrete way while the phonetic realization of the alignment of pitch target with the segmental material is gradient. Our results suggest that even functional variation typically realized in a fundamentally gradient fashion, such as in F0 range, duration, or peak scaling, might in some domains, such as peak alignment, produce a stable pattern.

The third pattern concerns adjustments in hyper-speech strategies in response to the need to communicate with a non-native speaker in addition to overcoming a high level of Lombard noise (80 vs. 80nn conditions). Despite a longer syllable duration and a higher F0 peak in 80nn compared to 80, the peak in 80nn is reached earlier than in the 80 condition. This co-occurs with a higher F0 minimum (the starting point of the rise), which shortens the “distance” for F0 that needs to be travelled between the onset value and the high target associated with the syllable. We speculate that these articulatory adjustments reflect an overall communicative goal of making the F0-peak realization as perceptually prominent as possible by aligning it as close to the vowel mid-point (and presumably the sonority and intensity maxima) as possible.

It thus seems that there are multiple synergistic strategies for increasing intelligibility of speech. In our case, the communicative goal in 80nn as compared to the

80 condition is to increase the F0 range, lengthen the syllable, and align the F0 peak with the intensity and sonority maxima of the syllable. We speculate that employing the same strategy from the 60-80 conditions (i.e., keeping the F0 minima stable, increasing the syllable duration and F0 maxima) would likely lead to sub-optimal peak realization: either the peak ends up too late or not sufficiently high. Therefore, a different synergy is employed in which a raised F0 minimum allows for the optimal F0 maximum realization, both in terms of its value and its segmental alignment.

Taken together with the observation in Šimko et al. (2014), who reported that communicating with a non-native speaker resulted in an increased overall duration of the sentences but not a comparable increase in the articulatory effort, our results suggest that the multiple degrees of freedom available to the speaker for improving intelligibility are used in different—presumably efficient—ways depending on the task at hand and the situation in which the conversation is taking place.

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# When One Phonology Meets Another: The Case of Gallicisms in Czech

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**Abstract:** We analyze phonological aspects of Gallicisms in Czech on a descriptive basis, using a recently proposed paradigm of adaptation principles. In a sample of 1,132 Gallicisms, the strongest principle identified is phonological approximation (substitution of foreign phonological units with the closest domestic ones), followed by spelling pronunciation (the application of Czech grapheme-to-phoneme conversion rules); these two principles are mutually combinable. A significant number of entries are influenced by a third language (German or Latin) in their phonological adaptation. The core rules of phonological approximation are fairly “mechanical,” but for some phonemes or features (especially vowel length), the projection is rather complex. Orthographically non-adapted Gallicisms and proper names of French origin exhibit greater “phonological blurriness” in the recipient language, and are thus more exposed to secondary adaptation processes, including the influence of English.

**Keywords:** Loanword Phonology; loanwords; Gallicisms; Czech.

## 1. Introduction

The goal of the present paper is to explore phonological aspects of Gallicisms (French loanwords) in Czech, using the concepts of Loanword Phonology as well as a recently proposed paradigm of loanword adaptation principles. Unlike previous works on the subject (Buben 1941; Romportl et al. 1978), which are prescriptive and sometimes atomistic, our analysis intends to be descriptive and system-oriented.

Within the paradigm of Loanword Phonology (e.g., Calabrese and Wetzels 2009; Kang 2011), the adaptation of a loanword is modeled as a *phonological repair* of an *illegal input*, whose aim is to make the word sufficiently “graspable” by the users of the target language. The core question of Loanword Phonology is structure-driven: what

is the system behind the given lexical subcategory, both with respect to the source and the phonology of the target language? Apart from that, other questions may be raised as well:

- Psycholinguistic: what happens in the mind of the speaker when he/she utters a loanword and how do these processes impact on the phonological form that is produced?
- Sociolinguistic: how does a speech community negotiate and stabilize phonological forms for loanwords?
- Diachronic: how does loanword pronunciation change over time?
- Normative: what are the correct pronunciations?

It goes without saying that all of these questions are relevant for domestic phonological forms as well, but the problems that they touch upon in the domain of loanwords are specific, since this lexical subclass is more peripheral and usually less stable than that of domestic words, and it is influenced by the phonology of the donor language not only at the moment of the loan but also—at least potentially—after it. Methodologically adequate research into these specific questions (leaving aside the normative aspects, which are a matter of decision) is still very rare, and consequently, psycholinguistic, sociolinguistic and diachronic hypotheses are mostly inferred from the observed forms.

In Duběda et al. (2014), an exhaustive system of adaptation processes, composed of eight mutually combinable principles, was put forward for Czech loanwords:

1. **Phonological approximation** (substitution of non-native phonemes with their closest domestic counterparts, application of Czech prosodic, phonotactic and morphological rules), e.g., *refuge* [ʁə'fy:ʒ] → *refyž* ['refi:ʒ] “traffic island,” where the phonemes /ə/ and /y/, which do not exist in Czech, were replaced by /ɛ/ and /i:/, respectively; final obstruent devoicing and stress normalization were applied; vowel length was maintained; a phonetic change [ʁ] → [r] was applied. We prefer the term “approximation” to Zeman’s (2011) “transphonemization,” which may be understood as being limited to the segmental level, or Mathesius’ (1935) “supposition,” which is archaic both in Czech and English.
2. **Spelling pronunciation** (application of Czech pronunciation rules to the foreign spelling form), e.g., *poste restante* ['poste 'restante] “general delivery.”
3. **Original pronunciation** (an application, or at least an approximation, of the phonological and phonetic rules of the donor language), e.g., *Victor Hugo* [viktɔry'go] instead of the usual pronunciation ['viktɔr 'ʔigo].

4. **Analogy with the donor language** (application of a phonological analogy from the source language, including “unnecessary repairs” [Kang 2011] and hypercorrection), e.g., *Auguste*, pronounced occasionally as [ˈʔoʒist] instead of [ˈʔogist], by analogy with other French words where the letter *g* is pronounced as [ʒ].
5. **Analogy with the recipient language** (application of a phonological analogy with domestic words, i.e., “folk etymology”), e.g., *protežovat* [ˈprotɛʒovat] “to favor” < *protéger* [pʁɔtɛˈʒɛ], pronounced by many speakers as [ˈproceʒovat], under the influence of domestic words such as *vytěžovat* [ˈviceʒovat] or *zatěžovat* [ˈzaceʒovat].
6. **Influence of a third language** (phonological changes induced by a third language, either because the word in question was adopted via this language, or by analogy with it), e.g., *Eiffelova věž* “Eiffel Tower,” unanimously pronounced as [ˈʔajfɛlova] and not [ˈʔɛfɛlova], under the influence of German pronunciation rules.
7. **Influence of universals** (reflects of processes largely attested in the world’s languages, which may emerge as a result of the instability caused by two conflicting phonological systems), e.g., *peloton* [ˈpɛlɔtɔn] “peloton,” sometimes pronounced as [ˈpeleton], probably by virtue of vowel harmony.
8. **Unclearly motivated pronunciation** (cases for which there is no obvious explanation, mostly because there are no analogical examples), e.g., the change [ɛ] > [ɛj] in the word *pangejt* [ˈpaŋɛjt] “roadside ditch” < *banquette* [bãˈkɛt].

Principles 4–8 may be considered as secondary because they are less frequent, their effect is mostly local, and their status with respect to norms is problematic.

## 2. Gallicisms in Czech

Gallicisms form a relatively numerous but nowadays almost non-productive category of loanwords in Czech; it is partly for this reason that most of them have adapted spelling (*chanson* > *šanson*; *paravent* > *paraván*), and thus have less phonological variability than orthographically non-adapted loanwords and proper names. They cover especially the semantic fields of culture, technology, politics, the natural sciences, and gastronomy (ordered by the frequency of the items found in Rejzek [2001]). Out of these domains, it is practically only the last one which is still relatively productive in contemporary Czech.

The phonological specificities of French loanwords include the occurrence of the borrowed phonemes /f/, /g/, and /o:/ (which are, however, typical of other loanwords too), as well as characteristic phoneme combinations: for example, if a word contains one of the borrowed phonemes /f/ or /g/ and the phoneme /ʒ/ (also occurring in native words), it is likely that it is of French origin (*žonglér* [ˈʒɔŋglɛ:r] “juggler,” *gáže* [ˈga:ʒɛ] “wages”).

It seems that characteristic phonotactic sequences which may help identify a noun as a Gallicism are especially word-final; they mostly correspond to a suffix and contain a long vowel: [ɛ:] (*komuniké* “communiqué”), [o:] (*šapitó* “circus tent”), [on/o:n] (*bujon* “broth”), [a:n] (*bonvínán* “bon vivant”), [a:j] (*tonáž* “tonnage”), [ɛ:r] (*exteriér* “exterior”). However, to make a serious psycholinguistic claim about this observation, a more thorough analysis would be necessary.

The connotations conveyed by Czech Gallicisms stem from the mental representations connected with France, which are mostly positive, and include features of cultivatedness, delicacy, sophistication, and sometimes effeminacy. The semantic fields covered by Gallicisms (see above) partly correspond to these representations. As a functional component of artistic, humorous or caricatural stylization (cf. Mareš 2003), French loanwords may appear with salient phonological features exaggerated.

### 3. Material and Analysis

We studied the set of entries described as being of French origin in the *Czech Etymological Dictionary* (Rejzek 2001, electronic version). We found 1,132 Gallicisms; for another 162 entries, French is given as a parallel, secondary, or potential source (e.g., *veto* “veto”: “from Latin via modern European languages (German, French)”; *bugr* “racket”: “unclear; may be related to the French *bougré*”). These items were not included in the sample. Out of the 1,132 Gallicisms that were studied, 94% have adapted spelling and 6% original spelling; 47% are provided with a Czech suffix (e.g., *kariéra* < *carrière* “career”) and 53% have—at least in their citation form—their original morphology (e.g., *regiment* < *régiment*); 59% are assumed to be adopted directly, 41% via German and two items via Russian.

Each word was given one of the following labels, denoting the primary adaptation process:

- (a) Approximation (Principle 1 only);
- (b) Spelling pronunciation (Principle 2 only);
- (c) Mixed adaptation (Principles 1 and 2 within one word, e.g., *tabouret* [tabu'kɛ] > *taburet* ['taburet] “stool”);
- (d) Parallel adaptation (two alternative pronunciations, one based on Principle 1 and the other on Principle 2, e.g., *menu* [mɛ'ny] → ['mɛni]/['mɛnu] “menu”);
- (e) No predominant primary principle (i.e., substantial influence of a secondary adaptation principle which makes it difficult to determine the primary principle).

If an item was equally explainable by Principle 1 and Principle 2 (e.g., *pardon* ['pardon] “pardon”), it was provided with the label “Principle 1,” as it can be considered the default case. Where relevant, a secondary label was assigned to describe a secondary adaptation principle. If the phonological form of a word adopted via German was equally explainable by the influence of German and Latin (e.g., *decentní* ['dɛtsɛnʲi:] “decent”), it was given the label “influence of German,” as the influence of German is considered more immediate.

## 4. Frequency of Adaptation Principles

### 4.1 General Overview

The frequency of adaptation principles as identified in the 1,132 items that were studied is given in Table 1.

|                                      | Primary adaptation principle                          | Secondary adaptation principle | Example   | Remark   |
|--------------------------------------|---|--------------------------------|---|--|
| Gallicisms in the sample (N = 1,132) | Phonological Approximation<br>65%                     | No secondary principle<br>58%  | <i>massage</i> [ma'sa:ʒ] ><br><i>masáž</i> ['masa:ʒ] “massage”  |  |
|                                      |   | Influence of Latin<br>4%       | <i>apéritif</i> [apɛʁi'tif] ><br><i>aperitiv</i> ['ʔapɛritɪf] “aperitif”  | analogy with Czech Latinisms ending in <i>-iv</i>                  |
|                                      |   | Influence of German<br>3%      | <i>manière</i> [ma'nje:ʁ] ><br><i>Manier</i> [ma'ni:ɛ] > <i>manýra</i> ['mani.ra] “quirk”                           | word adopted via German  |
|                                      |   | Influence of Russian<br>1 case | <i>bouteille</i> [bu'tɛj] ><br><i>бутылка</i> [bu'tilkə] ><br><i>butylka</i> ['butilka] “bottle” (slang)            | pronunciation adopted via Russian; alternative form <i>butelka</i> |
|                                      | Spelling pronunciation<br>16%                         | No secondary principle<br>3%   | <i>menuet</i> [mə'nɥɛ] ><br><i>menuet</i> ['mɛnuɛt] “minuet”  |  |
|                                      |   | Influence of Latin<br>7%       | <i>complémentaire</i> [kɔ̃plɛmɑ̃'tɛ:ʁ] ><br><i>komplemntární</i> ['kɔ̃plɛmɛnta:rɲi] “complementary”                 | analogy with Czech Latinisms ending in <i>-ární</i>                |
|                                      |   | Influence of German<br>6%      | <i>tendance</i> [tɑ̃'dɑ̃s] ><br><i>Tendenz</i> [tɛn'dɛnts] ><br><i>tendence</i> ['tɛndɛnsɛ] “tendency”              | word adopted via German  |
|                                      | Mixed adaptation (approximation and spelling)<br>10%  | No secondary principle<br>9%   | <i>caoutchouc</i> [kau'tʃu] ><br><i>kaučuk</i> ['kauʃuk] “rubber”   |  |
|                                      |   | Influence of German<br>1%      | <i>clavier</i> [kla'vjɛ] ><br><i>Klavier</i> [kla'vi:ɛ] ><br><i>klavír</i> ['klavi:r] “piano”                       | word adopted via German  |
|                                      | Parallel adaptation (approximation or spelling)<br>1% | No secondary principle<br>1%   | <i>buffet</i> [by'fɛ] ><br><i>bufet</i> ['bufɛt] / <i>bifé</i> ['bɪfɛ:] “snack bar”                                 |  |
|                                      | No predominant primary principle<br>8%                | Unclear modifications<br>3%    | <i>monture</i> [mɔ̃'ty:ʁ] ><br><i>mundúr</i> ['mɛndu:r] “uniform” (slang)   |  |
|                                      |   | Influence of German<br>5%      | <i>marcher</i> [mas'ʃɛ] ><br><i>marschieren</i> [maɛ'ʃi:ʁɔn] ><br><i>maširovat</i> ['maʃi:rovat] “to march” (slang) | word adopted via German  |

**Table 1.** Frequency of adaptation principles in the sample.

## 4.2 Primary Adaptation Principles

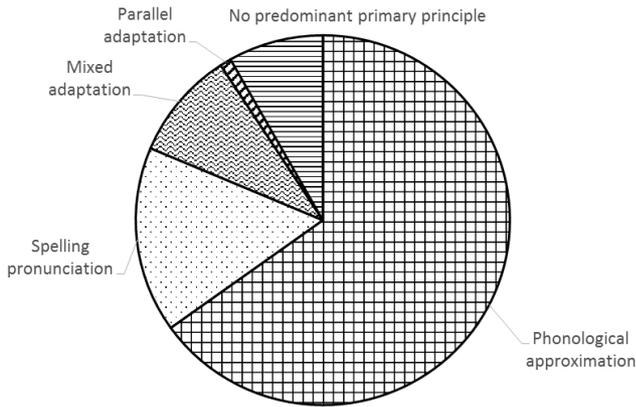
Among the primary adaptation principles (cf. Table 1 or, for a more synoptic view, Figure 1), it is phonological approximation which prevails by and large: 65% of the observed phonological forms are explained by this process alone, and another 11% in combination with the spelling pronunciation principle (mixed or parallel adaptation).

In the case of mixed adaptation, it is worth noting that the influence of spelling mostly consists of the restitution of the final consonant, which is not pronounced in French (79% of the items in this category). More generally, out of the 144 items in the sample where a final consonant is not pronounced in French (irrespective of the adaptation principle), it has been restituted in Czech in 88% of the cases (*appétit* > *apetyt* “appetite”; *pionnier* > *pionýr* “pioneer”; *galant* > *galantní* “courteous”), whereas in 12% of the cases, the word has been adopted without it (*fondant* > *fondán* “fondant”; *châssis* > *šasi* “chassis”). The strong tendency to reconstitute the final consonant is motivated morphologically (Buben 1941): a vocalic ending is not optimal for Czech masculine nouns (which are the most common counterparts for French words with a final silent consonant), and would lead to indeclinability and/or gender change, as is the case in words such as *šasi* “chassis,” *šapitó* “circus tent,” and *filé* “fish fillet” (all masculine in French, but indeclinable neuter in Czech), or *kudla* “jack-knife” (< *coutelas*; masculine in French, but declinable feminine in Czech). The fact that the treatment of final segments in a word may partly differ from that which is observed in non-final segments has been pointed out by Zeman (2011), and was also observed in Czech Anglicisms (Duběda et al. 2014).

As shown in Table 1, phonological approximation may be combined with the influence of Latin or German and, marginally, also Russian.

Spelling pronunciation accounts for a much smaller number of items than phonological approximation (16% by itself, and another 11% in combination with phonological approximation). Out of the 16%, as many as 13% of the items are affected by a third language (either Latin or German). The fact that the influence of Latin often leads to a spelling-based pronunciation is not surprising, as many intellectual words in French are Latinisms, and these are treated similarly to direct Latinisms in the process of adaptation (Mathesius 1935), i.e., pronounced largely according to Czech grapheme-to-phoneme conversion rules. Likewise, many Gallicisms adopted via German have undergone Latinization in German, which has led to a phonological form identical with Czech Latinisms.

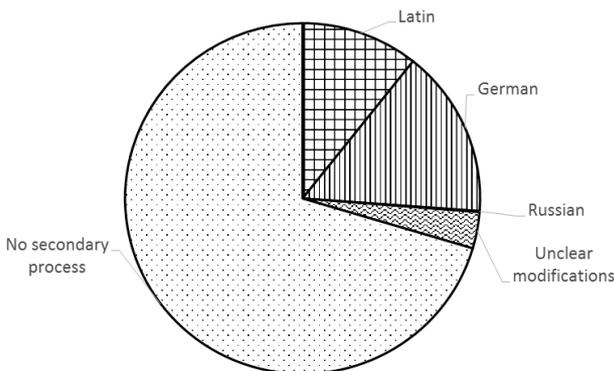
The last category, “No predominant primary principle,” is reserved for phonological forms in which the influence of a secondary adaptation principle is so significant that it would not be informative to assign any label for a primary adaptation principle. Some of these items show the phonological influence of German, via which they were adopted. For the others, the phonological changes are difficult to classify, as they do not form paradigms. Informal observation suggests that there are more expressive, colloquial and dated words in this category than in the others; these factors may help explain why their phonological behavior is different.



**Figure 1.** Frequency of primary adaptation principles in the sample.

### 4.3 Secondary Adaptation Principles

Secondary adaptation processes—irrespective of the primary ones—are summarized in Figure 2. In 71% of the items, no such principle interferes. The influence of Latin was identified in 11% of the words, that of German in 15% of the words, and that of Russian in one item. The category “Unclear modifications,” discussed above, includes 3% of the sample. All the words which show the phonological influence of German are labeled as indirect loans in Rejzek (2001). However, it is not without interest that another 292 words (26% of the whole sample), also labeled as indirect loans via German, bear no phonological traces of this language (e.g., *lůže* “theatre box”; *řofěr* “driver”; *tampon* “pad”). These items were adapted in the transition language in such a way that their subsequent adaptation to Czech phonology resulted in a form which is identical to the one which would have been achieved if the loan were direct.



**Figure 2.** Frequency of secondary adaptation principles in the sample.

## 5. Adaptation Principles: Further Details

### 5.1 Rules of Phonological Approximation

The basic rules of phonological approximation for Gallicisms are given in Table 2.

|  |
|--|
| <p><b>Vowels (irrespective of length) and semi-consonants:</b></p> <ul style="list-style-type: none"> <li>• [i y] → [ɪ] (<i>pilot</i> “pilot”; <i>bysta</i> “buste”)</li> <li>• [u] → [u] (<i>butik</i> “boutique”)</li> <li>• [e ε ø œ ə] → [ɛ] (<i>polemika</i> “controversy”; <i>komtesa</i> “countess”; <i>adié</i> “goodbye”; <i>portfej</i> “portfolio”; <i>cizelovat</i> “to polish”)</li> <li>• [o ɔ] → [o] (<i>gró</i> “major part”; <i>rozeta</i> “rosette”)</li> <li>• [a] → [a] (<i>dražé</i> “pellet”)</li> <li>• [õ ẽ ǎ] → [on ɛn an] (<i>kamion</i> “truck”; <i>kretén</i> “idiot”; <i>meandr</i> “meander”) or [om ɛm am] where motivated by spelling (<i>komtesa</i> “countess”; <i>parfém</i> “perfume”; <i>šampion</i> “champion”); in a small set of words ending in <i>-ment</i>, the nasality disappeared totally (<i>aranžmá</i> “arrangement”; <i>angažmá</i> “contract”; <i>apartmá</i> “appartement”; <i>abonmá</i> “subscription”)</li> <li>• [j] after a C and before a V → [ɪ] (<i>šampion</i> “champion”)</li> <li>• [wa] → [oa] (<i>toaleta</i> “toilet”)</li> <li>• [ʋi] → mostly [vɪ] (<i>biskvit</i> “biscuit”)</li> </ul> |
| <p><b>Vowel length:</b></p> <ul style="list-style-type: none"> <li>• Preservation of phonotactic length in word-final syllables before [ɣ v z ʒ vɛ] (<i>plenér</i> “plein air”; <i>enkláva</i> “enclave”; <i>póza</i> “pose”; <i>blamáž</i> “shame”; <i>manévr</i> “manoeuvre”).</li> <li>• Lengthening of decomposed nasal vowels in the final syllable (<i>volán</i> “frill”; <i>terén</i> “terrain”; <i>pasíáns</i> “the card game Solitaire”), but not before [t] (<i>volant</i> “steering wheel”; <i>fronta</i> “front”); in the case of word-final <i>-on</i>, lengthening is optional (<i>balkon/balkón</i> “balcony”).</li> <li>• Word-final short vowels [e ε ø ɔ] mostly lengthened (<i>komuniké</i> “communicé”; <i>filé</i> “fish fillet”; <i>adié</i> “goodbye”; <i>šapitó</i> “circus tent”).</li> </ul>   |
| <p><b>Consonants:</b></p> <ul style="list-style-type: none"> <li>• Most consonants exist in both languages and have a straightforward mapping (e.g., /p/, /n/, /ʃ/).</li> <li>• [ɣ] → [r]</li> <li>• [dʒ tʃ nʒ] → mostly [dʒ tʃ nʒ], sometimes [ʃj, cʃ, nʃ] (<i>bonboniéra</i> “box of chocolates”)</li> <li>• Very frequent restitution of the final silent consonant (<i>portrét</i> “portrait”).</li> </ul>   |
| <p><b>Phonotactics and prosody:</b></p> <ul style="list-style-type: none"> <li>• Final obstruent devoicing.</li> <li>• Stress shift to the first syllable.</li> </ul>  |

**Table 2.** Basic rules of phonological approximation for Czech Gallicisms.

## 5.2 Phoneme Mergers

Three vowel mapping rules shown in Table 2 describe a projection of two or more French phonemes onto the same Czech phoneme; this is because some contrasts that are present in the French vowel system do not occur in Czech (there are no front rounded vowels, no distinction between close-mid and open-mid vowels, and no central [ə]). With regard to consonants, a two-to-one mapping occurs with word-final obstruents, which undergo voicing neutralization in Czech. A question which may naturally arise in this context is whether these phonological mergers generate homophony; however, no such case has been observed in the sample, undoubtedly as a consequence of the limited number of Gallicisms and their greater length, one of the features characterizing intellectual words. Outside the sample analyzed here, homonymy may be observed marginally in proper names (both *Gilles* and *Jules* are pronounced as [ˈʒil] in Czech).

## 5.3 Vowel Length

Probably the most complex question related to phonological approximation is the behavior of vowel length. While the mapping of phonotactic length before voiced fricatives (see Table 2) is straightforward, the lengthening of decomposed nasal vowels is probably conditioned by an interplay of several factors: i) the greater intrinsic length of French nasal vowels compared to oral vowels (Léon 1992); ii) the influence of German phonotactics (German short vowels except for [ə] cannot appear in word-final syllables, so that words such as *bulletin* or *appartement*, which have a phonotactically short final vowel in French, are pronounced with a long vowel in German: [bylˈtɛː], [apaʁtəˈmɑː]); iii) possibly a general tendency to lengthen the final syllable in Gallicisms (cf. above). The inhibition of this lengthening before *-t* may be conditioned by an analogy with Latinisms ending in *-ant* or *-ent* (*emigrant*, *student*), which are always pronounced with a short vowel. This difference is especially apparent in the etymological doublet *volant* [ˈvolɑ̃] “steering wheel”/ *volán* [ˈvolaːn] “frill,” both stemming from the word *volant* [vɔlɑ̃]. If we extend the analysis beyond the sample under analysis, it is worth noting that the contrast [Ṽ] – [Vn] seems to be systematically redefined as a length contrast in Czech: *Jean* [ˈʒɑ̃] “John” vs. *Jeanne* [ˈʒɑ̃n] “Jane” > [ˈʒɑːn] vs. [ˈʒɑ̃n]; *Caen* [ˈkɑ̃] “city of Caen” vs. *Cannes* [ˈkɑ̃n] “city of Cannes” > [ˈkaːn] vs. [ˈkɑ̃n]. However, the tendency to lengthen the last vowel even in words which end in [Vn] in French can be observed nowadays: the toponyms *Cannes* or *Lausanne* are often realized as [ˈkaːn] and [ˈlozaːn] in the media, perhaps by virtue of the same general lengthening tendency as discussed above.

As for the lengthening of word-final [e ε ø o] (i.e., all French close-mid and open-mid vowels which can appear word-finally), several principles may be applicable again (cf. Buchtelová 1984): i) interpretation of closeness as length for the vowels [e ø o] under the influence of German, where vowel quality and length are interconnected and the vowels [e: ø: o:] only appear as long in word-final position (e.g., *filet* [fiˈlɛ] “filet”

> *Filet* [fi'le:] in German > *filé* ['filɛ:] in Czech); ii) the influence of spelling for the final *-é* [ɛ] (the acute accent marks closeness in French, but length in Czech); iii) the “iconic” influence of vocalic digraphs and trigraphs (e.g., the final [o] in *Cousteau* is more likely to be lengthened than the same vowel in *Corot*); iv) the influence of German for the vowel [ɛ], which is lengthened in final open syllables (e.g., *relais* “relay” [ʁə'lɛ] > [ʁə'lɛ:] in German > ['rɛlɛ:] in Czech), and v) the aforementioned general tendency to lengthen the final syllable in Gallicisms. Outside the sample analyzed here, one can observe interesting cases where the processes described above lead—paradoxically—to contrast enhancement. Zeman (2011) cites two French family names (*Brunot* and *Bruneau*, both pronounced as [bʁy'no] in French), which may be realized differently in Czech: in *Bruneau* ['brno:], as in other words in *-eau*, the lengthening is systematic, while in *Brunot* ['brno], it may be inhibited by the final consonant (mostly silent in the citation form, but pronounced in inflected forms, e.g., *Brunota* ['brnota] “of Brunot”). The virtual presence of the final consonant, along with the tendency to maintain the same vowel in the whole paradigm, increases the probability of having a short vowel in the citation form.

#### 5.4 Voicing Changes

One of the less regular consonant changes (3% of the sample) is voicing polarity (i.e., the voicing of voiceless obstruents and devoicing of voiced ones). French [s] may change into [z] by analogy with Czech Latinisms, where intervocalic and post-sonorant *s* is pronounced as [z] (*bazén* “swimming pool”; *dezert* “dessert”; *konzola* “console”). In seven words, one can observe the change [ʃ] > [z] (e.g., *žampion* “field mushroom”; *brožura* “brochure”), which is interpreted by Mathesius (1935) as being analogous to the change [s] > [z]. We do not fully subscribe to this view, as the voicing of [ʃ] has no support in Latin, and its frequency is more limited; however, no other explanation seems to be at hand. For other obstruents (excluding [s]), the prevailing change is devoicing, observed especially in colloquial and dated words (*bagatelle* > *pakatel* “derisory sum”; *gamache* > *kamaše* “leggings”). The source of this change is German, where lenis obstruents are frequently devoiced. Surprisingly, in five items (e.g., *tarte* > *Torte* > *dort* “cake”), the process is inverse.

### 6. Beyond the Analyzed Sample

Although the sample used for the present analysis is highly representative for common nouns, it does not encompass all the variability which may be encountered in the phonetic realization of French words in Czech. First, only standard pronunciation, which is mostly obvious thanks to orthographic adaptation, was taken into account, although some words may be realized differently (see, for instance, the examples *protežovat* and *peloton*, explained in Section 1). Second, a certain number of recent French loans and foreignisms, especially in the domain of gastronomy, is not represented in Rejzek

(2001): some of these items will probably maintain their original spelling (*foie gras*, *cordon bleu*), while others already have alternative spellings (*quiche/kiš*, *sommelier/someliér*). Third, an extensive set of French proper names is in use, which is regularly enriched by new items. These expressions maintain their original spelling, and are therefore more likely to exhibit greater variability in pronunciation as a result of their “phonological blurriness” in the recipient language (cf. Zeman 2003; Sekvent and Šlosar 2002).

The predominant principle in the treatment of orthographically non-adapted loans and proper names is phonological approximation, as in the sample analyzed here. However, the realization of these items depends more closely upon the speaker’s awareness of the expression, as well as his/her knowledge of French grapheme-to-phoneme conversion rules. Knowledge of French among the Czech population is rather limited: among the languages taught at secondary schools, French comes in third place after English and German (Vančurová 2010), but there is a significant gap between English and all other languages.

The proportion of the phonological variability of French words with original spelling may be considerable, as is testified by Říhová’s (2004) enquiry devoted to the word *croissant*, for which a surprisingly high number of pronunciation variants were collected, and our own survey of French expressions from the domain of gastronomy (Duběda 2013). The latter study confirmed, among other things, the assumption that English, the most studied foreign language and the most frequent source of recent loans, also interferes in the pronunciation of French expressions (e.g., the French specialty *cordon bleu* [kɔʁdɔ̃ˈblø] is often realized as [ˈgo:rdŋ ˈblu:], which corresponds to a hypothetical English form, *Gordon Blue*).

## 7. Conclusion

The application of a structured set of adaptation principles to a representative sample of common nouns of French origin allowed us to determine in what proportions these principles shape the output of phonological adaptation.

The strongest principle identified is phonological approximation, mostly based on “mechanical” mapping of phonological units or features. One could even assume that this projection accounts for a “shadow phonology” of French, which exists within a limited subclass of the Czech lexicon. The mapping is more straightforward for consonants, whereas the projection of vowels implies several phoneme mergers as a result of the differences between the two vowel systems. However, these mergers do not generate any substantial homonymy. The projection is particularly complex for vowel length.

The second primary adaptation principle—spelling pronunciation—is much less frequent; it can combine with phonological approximation in two ways: either within the same word (mixed adaptation, overwhelmingly consisting in the restitution of a silent final consonant) or in parallel (pronunciation doublets).

Among the secondary principles, it is especially the influence of German and Latin which affects the adaptation of French loans in Czech. However, the mechanism is different in both cases: while German served as a transition language, Latin was an external source of phonological reference as a result of the similarity of French and Latin words, which is striking, especially in the intellectual lexicon.

Some of the outcomes of our analysis open theoretically interesting questions which are, in our view, underestimated by seminal works on Loanword Phonology. These issues include the concurrence of pronunciation and spelling in the process of borrowing and the influence of third languages, as well as sociolinguistic factors.

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# Icelandic Meets Licensing Scales

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**Abstract:** One of the peculiarities of Icelandic phonotactics is that the inventory of two-member onsets found word-initially is quite big, but the same clusters appear to be parsed word-internally as coda-onset clusters (as evidenced by the absence of tonic lengthening and by coda lenition phenomena). In order to explain this mismatch it will be proposed that the initial nuclei are always headed in Icelandic and that they have a bigger licensing potential than non-initial nuclei, which are obligatorily headless. Loanwords are exempt from this constraint—they may host headed vowels in non-initial positions, which exerts influence on the preceding consonant. The adopted theoretical framework will be a blend of Strict CV (Scheer 2004; 2012) with the Complexity Scales and Licensing model (Cyran 2003; 2010).

**Keywords:** Icelandic; phonology; CVCV; consonant clusters; phonotactics.

## 1. Introduction

The purpose of this article is to explain some aspects of Icelandic phonotactics. Our theoretical framework will be a modified version of the Strict CV model (Scheer 2004; 2012) blended with the theory of Complexity Scales and Licensing (CSL; Cyran 2003; 2010). The model eliminates Proper Government, but retains some other important ingredients of Strict CV, for example empty CVs as boundary markers.

In the first part of the article an attempt will be made to prove that Icelandic distributes an empty CV at the left edge. Next, we will try to analyze the inventory of two-member branching onsets found word-initially and try to compare them with the more sparse stock of word-internal branching onsets. The discrepancies will be explained by the bigger licensing potential of word-initial nuclei than that of other nuclei. It will be argued that word-initial nuclei in Icelandic are obligatorily headed, whereas non-initial nuclei are obligatorily headless. Subsequently, we will examine the phonological behavior of loanwords and propose that unlike the native sphere of vocabulary,

loanwords can also host headed vowels in non-initial syllables. Furthermore, it will be demonstrated that the headed vs. non-headed hypothesis can provide a representational alternative to the analysis of several phenomena which are typically explained by means of a cyclic approach.

## 2. Boundary CV

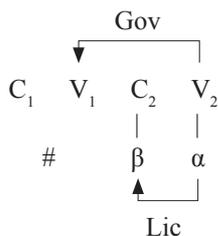
Lowenstamm (1999) proposed that the word boundary can be represented in phonology by means of empty syllabic space, which in the case of the CVCV framework means an empty CV position. This idea was further developed by Scheer (2004; 2012a), who made it one of the pillars of his interface theory. In Scheer's model, the distribution of the boundary CVs can follow one of the three scenarios (leaving procedural/phase-related factors aside):

- (a) the empty CV is not distributed at all (e.g., Greek, Polish)
- (b) the empty CV is distributed before every word (e.g., Old French)
- (c) the empty CV is distributed only at the beginning of the utterance (e.g., Belorussian, Corsican)

Languages of group (a) are referred to as RT-languages, whereas (b) and (c) as TR-languages. TR-languages typically allow only clusters of rising sonority at the left edge, whereas in RT-languages we can find also falling sonority clusters in this position. Further distinction between scenario (b) and (c) is made on the basis of the existence of external sandhi. Some TR-languages do not display connected speech, some others do. If the boundary CV is a sandhi blocker, we can assume that it is present before every word in languages without sandhi, but only utterance-initially when sandhi is attested.

Apart from the influence on the left-edge phonotactics, the presence of the boundary CV gives also rise to some other phenomena. Let us take a look at the phonological configuration of the word-initial site in a TR-language:

(1)



The word-initial consonant in a TR-language is always licensed and ungoverned, since the following nucleus is called to govern the V-slot of the boundary CV. Thus,  $C_2$  always ends up in the most favorable setting and is predicted to display segmental strength.

The boundary CV also makes a concrete prediction with regard to the first nucleus of the word. Since it is responsible for governing the nucleus of the boundary CV, it can never be governed itself. This is why a vowel ~ zero alternation can never affect the first nucleus of the word in a TR language—it would create an ungrammatical sequence of two ungoverned empty nuclei.

### 3. Boundary CV in Icelandic

Icelandic gives us pretty clear indications of the presence of the boundary CV, by fulfilling all the three criteria listed above. Only the criterion of TR-phonotactics poses several minor problems, which will be reported on below. Icelandic displays also external sandhi, which is why we assume that the initial CV is distributed only at the beginning of the utterance.

The first relevant criterion, the absence of vowel ~ zero alternation in the word-initial site, is probably the easiest one to argue for. There is no single situation in which the first vowel of the word could participate in the alternation. Note that vowel ~ zero alternations are an important part of the Icelandic phonological system as a whole—all three unstressed vowels /i, a, y/ alternate, producing quite complex interactions with syllabification, vowel length, preaspiration and other phonological phenomena. This point is a vital one because the absence of alternations with zero *per se* does not need to mean much. Some languages may simply accidentally lack them, i.e., choose not to make use of the mechanism. This is not the case in Icelandic: vowel ~ zero alternations do occur, but never in the word-initial position.

The second criterion, strength of word-initial consonants, also appears to be fulfilled without complications. Lenition of the word-initial consonant is not on record in Icelandic. What is more, the initial position hosts a wider array of contrasts than all other positions. For instance, voiceless fricatives /f, θ/ can be found at the left edge, whereas the contrast of voicing is neutralized intervocalically (at least in native vocabulary). The word-initial position is also the only site in which Southern Icelandic features aspirated plosives. Underlying fortis plosives undergo deaspiration intervocalically and word-finally, remaining intact at the beginning of the word, e.g., *tapa* /tʰapʰa/ “lose” → [tʰa:pa], *hvít* /kʰvitʰ/ “white” → [kʰvi:t].

As far as the third criterion is concerned, i.e., TR-phonotactics, the emerging picture is slightly less clear. On the one hand, Icelandic does not have any #RT or #TT clusters at the left edge (\*#rta, \*#kpa). On the other hand, #RR clusters (involving /j/) are abundant (Árnason 2011, 163):

- (2) /rj/, e.g., *rjómi* [ˈrjɔu:mɪ] “cream”  
 /lj/, e.g., *ljós* [ljɔu:s] “light”  
 /mj/, e.g., *mjólk* [mjɔuɫk] “milk”  
 /nj/, e.g., *njóta* [ˈnjɔu:tʰa] “to enjoy”  
 /rj/, e.g., *hrjóta* [ˈrjɔu:tʰa] “to snore”

Even though many phonologists would be tempted to postulate that these clusters are single palatalized segments, note that their behavior word-internally suggests that they are rather parsed as coda-onset clusters. Sonorant-/j/ clusters always block tonic lengthening of the preceding stressed nucleus, e.g., *velja* [ˈvɛlja] “choose,” *berja* [ˈpɛrja] “strike,” *emja* [ˈɛmja] “wail,” *venja* [ˈvɛnja] “get used.”

There are also several word-initially found TR clusters the word-internal behavior of which does not confirm their status as branching onsets. Consider the following data:

| (3) Cluster | Word-initially                         | Word-internally                                     |
|-------------|--|---|
| /pʰ/        | <i>plástur</i> [ˈpʰlaustvɪr] “bandage” | <i>epli</i> /ɛpʰlɪ/ → [ˈɛhplɪ] “apple”              |
| /kʰ/        | <i>klára</i> [kʰlau:ra] “finish”       | <i>hekla</i> /hɛkʰla/ → [ˈhɛhkla] “crochet”         |
| /kʰn/       | <i>knapi</i> [kʰna:pʰɪ] “jockey”       | <i>kvikna</i> /kʰvikʰna/ → [kʰvihkna] “to light up” |

Even clusters with /l/, otherwise canonical branching onsets, appear to be parsed as such only word-initially in Icelandic. In the middle of the word the plosive is assigned to the coda, causing the lack of lengthening and preaspiration, which is analyzed here as a lenition process taking place in the internal coda position. The synchronic reality of the process is guaranteed by the existence of productive alternations like *depil* [ˈtɛ:pʰɪl] “dot” (acc.sg.) ~ *deplar* [ˈtɛhplɪr] “dot” (nom.pl.), or *jökul* [ˈjœ:kʰvɪl] “glacier” (acc.sg.) ~ *jökklar* [ˈjœhkɫar] “glacier” (nom.pl.).

Icelandic is actually very picky about word-internal branching onsets. Only clusters of one of the strongest segments /pʰ, tʰ, kʰ, s/ followed by one of the weakest segments /j, v, r/ syllabify as onsets and induce tonic lengthening.

- (4) *sötra* [ˈsœ:tʰra] “to slurp”  
*neþja* [ˈnɛ:pʰja] “bad weather”  
*götva* [ˈkœ:tʰva] “to discover”  
*flýsja* [ˈflɪ:sja] “to peel”

It is only a small subset of what we may find word-initially. How can this striking discrepancy be interpreted? Gussmann (2003), working in the Standard Government Phonology model, concluded that almost all of the word-initial clusters are actually bogus clusters. “True” branching onsets are hardly existent in Icelandic—only clusters of an

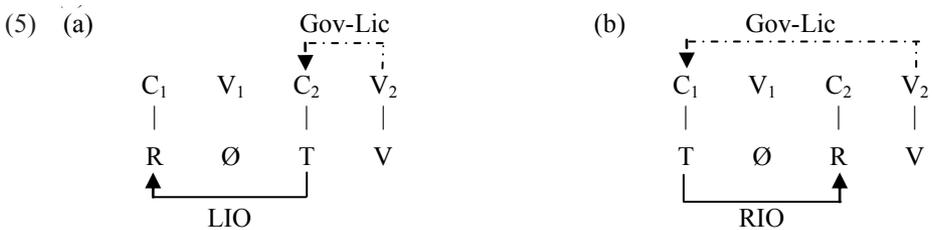
obstruent followed by /r/, and possibly by /j/, fulfill the criteria. “The final answer to the question contained in the title *Are there branching onsets in Modern Icelandic* must be then: *Yes, but only just*” (Gussmann 2003, 336). Nonetheless, Gussmann’s assumption that one cluster cannot be syllabified differently in different positions of the word is unwarranted and imposed by the limitations of his theoretical framework.

In fact, all of the word-initial two-member clusters in Icelandic can be successfully analyzed as branching onsets.<sup>1</sup> Note that in all of the quoted examples the quoted clusters are of rising sonority. It is just the steepness of the rise that may seem unsatisfactory. The point of departure for our proposal is that the word-initial nucleus has a bigger licensing potential than other nuclei. However, before we can elaborate on this idea, the basics of our theoretical framework will be introduced and the Icelandic data will be addressed again in Section 5.

#### 4. Theoretical Preliminaries

This section will introduce the reader to the basic set of relationships which are characteristic of the version of CVCV that we will use for handling the Icelandic data.

Unlike Scheerian CVCV, the present model does not recognize Proper Government. All clusters are created by means of two Interonset Government relations: RIO (Rightward Interonset Government) for branching onsets and LIO (Leftward Interonset Government) for coda-onset clusters. Relevant configurations are depicted in (5):



LIO subsumes both coda-onset clusters and what in Standard GP was known as “bogus clusters.” Thus the theory opts for a strict two-way distinction: branching onsets vs. “everything else,” partially following Scheer (2004), but also departing from it by postulating the existence of an interconsonantal relation between both members of the coda-onset cluster.

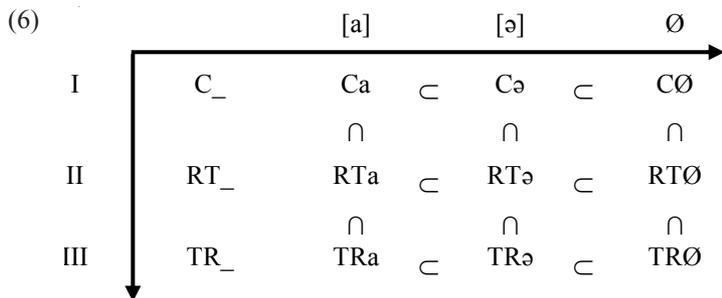
In both cases, RIO and LIO, the nucleus following the cluster plays the crucial role. In order that an interconsonantal relation can be contracted, the governor needs to be licensed by a nucleus. In the case of LIO the licenser is local to the governor

<sup>1</sup> The /s/-clusters are disregarded in the present analysis. Their satisfactory treatment is still missing from Government Phonology literature, and this shameful situation will unfortunately not be rectified within the limits of this paper.

(see [5a])—the nucleus licenses the immediately preceding onset. In RIO the distance between the governor and its licenser is bigger, with the nucleus forced to reach one step further—to the onset of the preceding CV slot. Due to this reason, RIO is more difficult to license than LIO. Following Cyran (2003; 2010), we will assume that there is a universal implicational universal between the existence of RIO and LIO: languages which have RIO (i.e., branching onsets) will also display LIO (i.e., coda-onset clusters). The reverse is not true, since there are languages with coda-onset clusters which lack branching onsets.

Another important ingredient of Cyran’s theory which is incorporated to the present proposal is the concept of the scalar strength of licensers. The stronger the nucleus is, the more it can license. “Strength” in Cyran’s model decreases along the following axis: full vowel—reduced vowel—empty nucleus. For instance, if a reduced vowel can license LIO in some language, then a full vowel will too (but not necessarily an empty nucleus). If an empty nucleus can license RIO, then also a full vowel and a reduced vowel will not have a problem with licensing branching onsets.

In other words, a full vowel can always license more (or at least not less) than a reduced vowel, and a reduced vowel can always license more (or at least not less) than an empty nucleus. When we take also simple onsets into account, we end up with a 3x3 grid of three levels of linguistic complexity and three licensers (figure adapted from Cyran 2010, 107):



The relations depicted above are assumed to be universally relevant and constitute part of Universal Grammar.

### 5. Handling Icelandic Branching Onsets

Having in mind the system of licensing scales, it becomes much easier to account for the incongruity between the word-initial and word-internal branching onsets. However, some important assumptions need to be made.

Every branching onset, no matter what position in the word, is a domain of Rightward Interonset Government (RIO). However, not all clusters of rising sonority

can form RIO with equal ease. We assume that it is “easier” in clusters with a steep sonority rise (which can occur word-internally), whereas it is more “difficult” in clusters with a flat rise (which occur only word-initially). Thus, Icelandic demonstrates the need to split the third level of linguistic complexity in (6) into two subclasses, based on the steepness of sonority rise. This is not a novel idea, since also Cyran (2010, 178) signaled a necessity of splitting level three in order to account for the melodic limitations on clusters hosting alternations sites in Polish (see also Cyran [2014]). RIO in a cluster with a flat rise may demand a stronger licenser than an “easy” RIO.

The first formulation of the main claim of the paper runs like this: Icelandic stem-initial nuclei can license more complex structures than other nuclei. However, being stem-initial is not a phonological property and should not have a direct bearing on the licensing potential of a nucleus. Is the first nucleus of the stem really different from other nuclei? Why should it be the case? Please note that Icelandic does not have [ə] or any other vowel which could be unambiguously described as “reduced” (at least in synchronic terms).

A property which (almost) invariably characterizes the stem-initial position in Icelandic is stress. Stress assignment is very regular with the primary stress falling on the first nucleus on the left. Can we thus generalize that stressed vowels can license more than unstressed vowels?

This statement also calls for revision, since the stem-initial nucleus may end up secondarily stressed or entirely unstressed in some configurations (for instance, in compounds):

- |         |  |          |
|---------|--|----------|
| (7) (a) | <i>ó#bliður</i> ['ou:pliðʏr] “harsh”                     | *[ɔupl]  |
|         | <i>ó#knyttir</i> ['ou:kʰnihtʏr] “prank” (pl.)            | *[ɔuhkn] |
| (b)     | <i>ó#frið#legur</i> ['ou:frið,lɛ(:)ʏʏr] “hostile”        | *[ɔufr]  |
|         | <i>ó#þjóð#legur</i> ['ou:θjɔuð,lɛ(:)ʏʏr] “anti-national” | *[ɔuθj]  |
|         | <i>ó#þrot#legur</i> ['ou:θrɔt,lɛ(:)ʏʏr] “inexhaustible”  | *[ɔuθr]  |

In (7a) the two examples display a *secondarily* stressed [i]/[ɪ] vowel, which, however, appears to license the syllabification of the preceding [pl]/[kʰn] cluster as a branching onset. The evidence comes from the length in the vowel of the prefix and the lack of preaspiration in the latter case—no “resyllabification” takes place when the licenser loses primary stress. In (7b) the vowel of the stem is completely devoid of stress. However, the preceding clusters [fr, θj, θr] are not resyllabified either and we still encounter a long vowel in the prefix.

Obviously, these data could be also approached procedurally (which is what most phonologists would probably do)—vowel length in the prefix results from the fact that

it is independently spelled-out, after phonological computation in the stem is finished. It is certainly a viable alternative, but the approach argued for in the present article endeavors to eliminate cyclicity and to replace effects attributable to it by representational configurations. Ideally, syllabic computation operates only once on the whole string. And from this perspective, the analysis of the data in (7) suggests that the presence or absence of stress is not evidence on its own.

In order to formulate an alternative explanation, we will take a closer look at the vocalic system of Icelandic.

## 5.1 The Vocalic System of Icelandic

One of the most conspicuous features of Icelandic is that nuclei in initial syllables can host a much wider array of contrasts than nuclei in all other positions. There are 8 monophthongs (i, ɪ, ε, a, γ, œ, ɔ, u) and 5 diphthongs (ai, ei, œi, ou, au) found in initial syllables. All of them can be long or short, depending on the environment—lengthening takes place in stressed open syllables. The inventory of nuclei found in non-initial syllables is much smaller. Only one of the three simple nuclei /ɪ, γ, a/ (< Old Norse /i, u, a/) can occur in a non-initial syllable.

In order to characterize the internal structure of Icelandic nuclei, we adopt the Element Theory (see Harris and Lindsey 1995; Backley 2011), which is the default model of subsegmental organization among Government Phonologists. The Element Theory recognizes a limited inventory of privative melodic primes, the number of which nowadays usually oscillates about 5–8. For the purposes of the present paper, we will concentrate on only three elements found in nuclei. They are {I} (front), {U} (rounded), and {A} (low). Phonological expressions consisting of these elements in isolation are pronounced as [i], [u] and [a] respectively. To derive other vowels, it is postulated that elements can combine with each other to form complex expressions. For instance, [e] consists of {I•A}, and [o] of {U•A}. When more contrasts are necessary, linguists often use the notion of *headedness*: one of the elements becomes the head of the whole expression and contributes more to the phonetic output than the other. For instance, the internal structure of [ɛ] can be {A•I} (the head is underlined), and of [ɔ] {A•U}, in which {A} takes over the head role (in contrast with {I•A} for [e] and {U•A} for [o]).

In the present paper we ascribe one more dimension to the property of headedness. Namely, we associate headedness with licensing potential.

First, let us propose that there is an important representational difference between the two sets of Icelandic vowels. It can be formulated in the following way:

- (8) All vowels in initial syllables are obligatorily headed.  
All vowels in non-initial syllables are obligatorily headless.

The difference is encoded in the lexicon and directly influences the course of syllabification.<sup>2</sup> Headed vowels have a bigger licensing potential than headless vowels, which is why the clusters preceding them are more likely to be parsed as branching onsets.

We assume the following internal structure for Icelandic nuclei in initial syllables:

- (9)
- |         |                      |
|---------|----------------------|
| /i(:)/  | { <u>I</u> }         |
| /ɪ(:)/  | { <u>I</u> •A}       |
| /ɛ(:)/  | { <u>A</u> •I}       |
| /a(:)/  | { <u>A</u> }         |
| /ɤ(:)/  | { <u>U</u> •I}       |
| /œ(:)/  | { <u>A</u> •U•I}     |
| /ɔ(:)/  | { <u>A</u> •U}       |
| /u(:)/  | { <u>U</u> }         |
| /ai(:)/ | { <u>A</u> } {I}     |
| /ei(:)/ | { <u>A</u> •I} {I}   |
| /œi(:)/ | { <u>A</u> •U•I} {I} |
| /ou(:)/ | { <u>A</u> •U} {U}   |
| /au(:)/ | { <u>A</u> } {U}     |

All 13 nuclei, including monophthongs and diphthongs alike, contain a head.

For the three nuclei found in non-initial syllables the following structure is proposed:

- (10)
- |     |                   |
|-----|-------------------|
| /ɪ/ | { <u>  </u> •I•A} |
| /ɤ/ | { <u>  </u> •I•U} |
| /a/ | { <u>  </u> •A}   |

Event though the nuclei in (10) have (to a large extent homophonous) initial counterparts /ɪ(:), ɤ(:), a(:)/, they are assumed to be distinct phonological objects. They behave differently and have different phonological properties, especially with regard to their strength of licensing.

## 5.2 The Process of Syllabification

Syllabification in the proposed model is a cover term for the process in which the lateral forces, licensing and Interonset Government, are established within the course of computation. No relation is stored in the lexicon, which contains only CV slots and melodic primes linked to them via association lines. Syllabification proceeds from right to left.

<sup>2</sup> We assume that “initial” actually refers to “root-initial.” The vowels of grammatical affixes can be headless.

RIO always applies first (at least in languages which parametrically allow RIO). When it fails, then LIO can be established. Let us work through two examples, *epli* “apple” and *plástur* “bandage”:

(11) Example #1: underlying /εp<sup>h</sup>lɪ/ (*epli* “apple”)

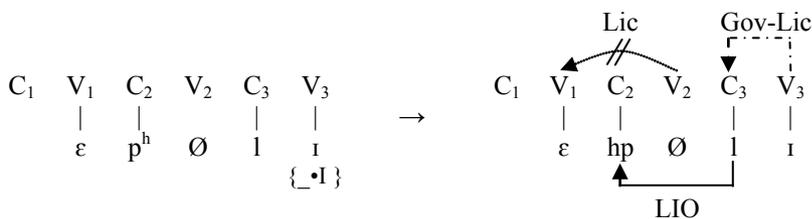
(a) /ɪ/ makes an attempt to license /p<sup>h</sup>/ to establish RIO with /l/

(b) /p<sup>h</sup>l/ is too difficult an onset and (headless) /ɪ/ is too weak a licensor; RIO fails

(c) /ɪ/ licenses /l/ to establish LIO with /p<sup>h</sup>/; LIO is successful

(d) Consequences: coda lenition /p<sup>h</sup>/ → [hp]; no tonic lengthening

(e) Output: [ˈɛhpɪ]



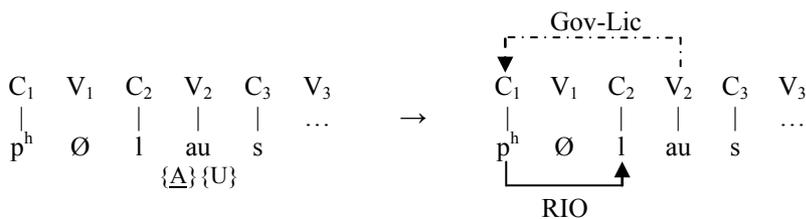
(12) Example #2: underlying /p<sup>h</sup>laustyr/ (*plástur* “bandage”)

(a) The headed /au/ non-locally licenses /p<sup>h</sup>/ to establish RIO with /l/

(b) /au/ is a strong licensor, so RIO easily gets through; a branching onset is established

(c) No lenition takes place

(d) Output: [ˈp<sup>h</sup>laustyr]



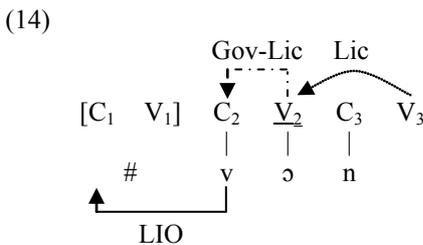
We can easily see that the difference in the behavior of the cluster in *epli* “apple” and in *plástur* “bandage” is reducible to the difference in the strength of the licenser. The same underlying consonantal sequence /p<sup>h</sup>l/ is parsed differently in the computational system depending on what licenser follows. Headed nuclei are the most robust licensers and they license all configurations. Headless nuclei are unable to license RIO in clusters with a flat sonority rise.

Note, however, that Icelandic headless (and empty) nuclei are still very strong from the typological point of view. They can license simple consonants, RT clusters, and steep TR clusters (Icelandic displays TR clusters at the right edge, e.g., *sötr* “slurp”). RIO in flat TRs is the only configuration at which Icelandic headless and empty nuclei fail.

| (13)  | a) Headed nuclei | b) Headless nuclei | c) Empty nuclei |
|---|------------------|--------------------|-----------------|
| <b>I</b><br>C_                                      | YES              | YES                | YES             |
| <b>II: LIO</b><br>RT_                               | YES              | YES                | YES             |
| <b>III: RIO</b><br>steep TR_<br>( <i>ptks+jvr</i> ) | YES              | YES                | YES             |
| flat TR_  | YES              | NO                 | NO              |

At this point we may return to the original question asked in Section 3: does Icelandic distribute an empty CV at the left edge? Having explained the reason for the discrepancy between the word-initial and word-internal phonotactics, we can safely state that it does.

There is one more relevant question which calls for being addressed: how can the ECP of the vocalic slot of the boundary CV be fulfilled in a model with LIO and RIO and no Proper Government? Actually, this is not as problematic as one may think. We will assume that the first onset of the stem simply contracts LIO with the empty consonantal position of the boundary CV. The following figure demonstrates the representation of Icelandic *von* [vɔ:n] “hope.”



In the first step,  $V_2$  licenses  $C_2$  to establish LIO with  $C_1$ . LIO is contracted and the ECP of  $V_1$  is satisfied by virtue of being enclosed in an interconsonantal relation. In a word which begins with a TR cluster, the empty nucleus in a RIO relation is laterally enabled, which is why it can also easily license LIO with the boundary CV. In contrast, the LIO relation is assumed to completely deprive the intervening nucleus of its lateral abilities. Therefore, LIO can never be preceded by another LIO, and the sequence #RT can never exist in a language which distributes the initial CV. The difference between the licensing potential of nuclei enclosed in RIO and LIO manifests itself also in the behavior of preceding vowels: vowels before RIO clusters display open syllable effects, whereas vowels followed by LIO show closed syllable effects.

Note that being a governor contributes to, e.g., the inherent strength of a segment—the first consonant of the word in a TR-language is strong since it acts as a governor. In an RT-language the first consonant of the word is not a governor, so it is predicted to be weak. This is exactly the position taken in the Coda Mirror theory. As a matter of fact, almost all predictions of the Coda Mirror theory can be also expressed in a framework without Proper Government. However, a closer inspection of this issue transcends beyond the limits of this paper.

One of the advantages of the LIO approach to the boundary CV is that it makes direct reference not only to the vocalic slot of the boundary marker, but also to the consonantal one. In models with Proper Government only the V-slot is relevant, and it could be argued that there is no independent evidence for the consonantal position before it. Szigetvári (1999, 95) claims that “it is the word-initial empty V position that is relevant for the majority (if not totality) of phenomena that word-initial empty sites are expected to explain,” using it as one of the arguments for repartitioning the skeleton and introducing VC phonology. Within the proposed approach the C-positions are bound to be relevant on all accounts, since the ECP of a nucleus is always satisfied by consonants contracting an Interonset Government relation across it. Government is no longer an internuclear issue completely insensitive to the nature of the segments occupying neighboring consonantal slots.

## 6. The Phonological Patterning of Loanwords

In the present section it will be argued that the proposed hypothesis of the differing licensing potential of headed and headless nuclei can account for some peculiarities of the phonological behavior of loanwords.

We assume that the constraint on headed vowels in non-initial syllables does not apply to loanwords. A loanword can host a headed vowel in each position in a word. This is evident from the very inventory of unstressed vowels found in loanwords. Consider the following selection of data:

- (15) *september* ['seftɛmpɛr] “September”  
*október* ['ɔxtɔupɛr] “October”  
*strætó* ['strai:tɔu] “bus”  
*strúktúr* ['struktur] “structure”  
*nælon* ['nai:lɔn] “nylon”  
*gúrú* ['ku:ru] “guru”

What are the consequences? Apparently, non-initial vowels in loanwords can license more than native non-initial vowels. There are a number of phenomena which confirm this observation.

For instance, the word *Afríka* “Africa” is pronounced as [ˈaːfɾika], i.e., with a long vowel. This suggests that /fr/ is parsed as a branching onset, even though this cluster does not belong to the recognized inventory of word-internal branching onsets. However, it is a possible branching onset word-initially: *frost* [frɔst] “frost,” *frélsi* [ˈfrɛlsɪ] “freedom.” But the cluster in *Afríka* is not followed by the weak headless /ɪ/, but rather by /i/, i.e., the headed {I}, which would not be able to exist in a non-initial syllable in a native Icelandic word. The licensing strength of /i/ is the reason why RIO can be easily established in /fr/.

Another patent characteristic of loanword phonotactics is tolerance of more complex segments in the intervocalic position. For example, Southern Icelandic has a late rule of deaspiration (already mentioned in this article) which applies intervocalically and domain-finally:

- (16) *tapa* /tʰapʰa/ “lose” → [ˈtʰaːpa]  
*líta* /litʰa/ “look” → [ˈliːta]  
*hvít* /kʰvitʰ/ “white” → [kʰviːt]

The rule does not apply to loanwords, as evident from (17):

- (17) *Ítalía* [ˈiːtʰalija] “Italy”  
*tópas* [ˈtʰɔuːpʰas] “topaz”  
*ópera* [ˈɔuːpʰɛra] “opera”  
*hótel* [ˈhɔuːtʰɛl] “hotel”

This phenomenon is independent of dialectal divisions—both Northern and Southern Icelandic display an aspirated plosive in the items presented in (17).

This effect can be again attributed to the presence of a strong licensor. Deaspiration underapplies because the plosive is followed by a headed vowel. For instance, [a] in loanwords *Ítalía* and *tópas* is {Δ}, whereas [a] in native vocabulary is {•A}.

We have also mentioned that there are no intervocalic [f, θ] in native Icelandic vocabulary. Voiceless fricatives [f, θ] cannot be licensed when a headless nucleus follows: *sofa* ['sɔ:va] “sleep” (\*sɔ:fa); *taða* ['ta:ða] “hay” (\*ta:θa). Nonetheless, they occur in loanwords: *safari* ['sa:fari] “safari”; *kaþólskur* ['kʰa:θɔulskʏr] “catholic.” This is also due to the headed vowel in the second syllable.

Note that intervocalic aspirated plosives and voiceless fricatives are present also in one subset of native Icelandic vocabulary items: in compounds.

- (18) *á#kaf#lega* ['au:kʰav,leya] “extremely”  
*ó#tið* ['ɔu:,tʰiθ] “bad weather”  
*á#felli* ['au:,fetlɪ] “doom”  
*ó#farir* ['ɔu:,farɪr] “calamities”  
*sjó#fær* ['sjɔu:,fair] “navigable”  
*ó#þarfur* ['ɔu:,θarvʏr] “unnecessary”  
*skrá#þurr* ['skrau:,θʏr:] “very dry”

Of course, they do not violate the generalization concerning the ban on complex segments in the intervocalic position, since underapplication is easily explicable by means of cyclicity—respective parts of the compound are spelled-out independently, and the plosive or the voiceless fricative is never “intervocalic.” Consider, however, that there is a representational alternative, already hinted upon in Section 5: the second member simply contains a headed initial vowel which is a strong licensor. The same representational object (a headed vowel) is thus responsible for the behavior of intervocalic consonants in both loanwords and compounds. No resort to cyclicity is necessary.

In this way we accomplished a unified account of the phonological behavior of both compounds and loanwords. Even though an explanation based on cyclicity could be formulated for compounds, notice that no such alternative would be available for loanwords. This is why phonologists working in other frameworks would need to look for an independent way of explicating the misbehavior of loanwords, postulating, e.g., co-phonologies, diacritic marking in the lexicon or some other mechanisms of dubious nature.

## 7. “Double Agents”

Cyran (2003; 2010) maintains a three-way distinction of licensors: [a] full vowel – [ə] schwa – [Ø] zero. Schwa, of course, does not refer to [ə] only, but rather to any reduced vowel. But the hard fact is that not all languages have “weak/reduced vowels” which are unambiguously distinct from “strong/full vowels.” In the case of Icelandic the “weak” vowels /ɪ, ʏ, a/ are a *subset* of the inventory of vowels found in more prominent positions. They have (homophonous) strong counterparts, but they differ from them in phonological patterning.

This assumption enforces on the analyst a “double agent” analysis of the nuclear system (more on “double agents” in Gussmann [2002, 186–204]). Sometimes exactly the same phonetic segment may correspond to more than one phonological object. The phonetic value [a] may thus map onto both {A} and {•A}, [i] on {I•A} and {•I•A}, and [y] on {U•I} and {•U•I}. The disadvantages of the double agent analysis are clear: such data pose a huge learnability challenge. Nonetheless, it is necessary to admit that the issue with learnability is a “lesser evil” which one should be willing to accept considering that there is simply more to gain by adopting the model of Complexity Scales and Licensing. Hopefully, the paper has successfully demonstrated that Icelandic abounds in phenomena which prove the correctness of the general idea of the CSL theory. Probably future research will one day bring a satisfactory solution to the “double agent” problem in languages of the Icelandic type.

## 8. Conclusions

The paper presented an entirely novel approach to selected aspects of the phonotactics of Icelandic. It applied the concept of licensing scales (Cyran 2003; 2010) to Icelandic data, combining it with elements of Scheerian CVCV, e.g., the idea of an empty CV slot as a boundary marker. The analysis shows that licensing scales are a powerful tool when their potential is fully utilized. They allow us to successfully explain the mismatch between word-initial and word-internal phonological effects in Icelandic and provide an explanation for the misbehavior of loanwords. The account also offers a representational alternative to procedural approaches to the phonology-morphosyntax interface.

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# Phonetic Reduction of Repeated Mentions of Content Words in L1 and L2 English

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**Abstract:** This study investigates the phonetic reduction of repeated mentions of content words in the course of spontaneous dialogue, comparing productions in non-native English (spoken by Czech and Norwegian speakers) with native English speech. The study focused on durational, rhythmic, and spectral aspects of reduction in the words under investigation. Repetitions of words by a given speaker, as well as the overall status of words within the dialogue, were taken into consideration. The results showed a consistent reduction, both durational and spectral, of the repeated mentions of content words in both native and non-native production. However, the Czech speaker group showed a deviating rhythmic pattern. Unlike the native English speakers and Norwegian speakers, the Czech speakers had noticeably higher ratios of unstressed syllable duration in their first mentions of content words. This pattern is probably due to the substantial differences in rhythm-related phonological properties between their L1, Czech, and L2, English.

**Keywords:** phonetic reduction; non-native production; repeated mentions; spontaneous speech.

## 1. Introduction

For more than half a century, it has been observed that less predictable elements in speech tend to be articulated more carefully than more predictable ones (Lieberman 1963; Bolinger 1963; Hunnicutt 1985; Aylett and Turk 2004). According to Lindblom's (1990) H&H theory, highly predictable linguistic units may be considered more redundant in the discourse, and therefore the effort required for their production may be reduced. A number of factors related to predictability,

including lexical frequency (Guion 1995; Bell et al. 2002), conditional probabilities of word occurrence in a given context (Bell et al. 2003), and word bigram frequency (Torreira and Ernestus 2009; Schuppler et al. 2012), have been shown to have an effect on various manifestations of phonetic reduction. Another factor closely associated with word predictability is the repeated occurrence of a word within the discourse. Previous research has shown that repeated mentions of words within a discourse are shorter, less intelligible when presented in isolation, and have a lower F0 and more centralized vowel qualities compared to the first mentions of the words (e.g., Fowler and Housum 1987; Koopmans-van Beinum and van Bergem 1989; Shields and Balota 1991; Baker and Bradlow 2009). In addition, a greater degree of reduction of repeated mentions was found to occur in spontaneous speech and in communicative contexts (Koopmans-van Beinum and van Bergem 1989). The systematic variation of acoustic and phonetic parameters between first and repeated mentions of words helps increase the efficiency of communication by reducing the articulatory effort in repeated mentions, as well as signaling the status of content words as new or given in a discourse.

It is well known, however, that non-native production patterns differ from native ones in a number of relevant aspects. For example, a higher frequency of pauses (Riggenbach 1991; Trofimovich and Baker 2006), lower articulation rates (Towell et al. 1996; Guion et al. 2000; MacKay and Flege 2004), and the less frequent occurrence of connected speech processes (Hieke 1984; Nguyen and Ingram 2004) were reported in the speech of less experienced non-native speakers. These findings indicate that non-native speakers' lack of fluency and experience in their second language (L2) may lead to a lower degree of reduction or other deviations from native-like reduction patterns. Therefore, it remains an open question whether the reduction tendencies described above apply in non-native speech in a comparable way to native production. In particular, the question of the reduction of repeated mentions in non-native speech has only been addressed by two studies. While Baker et al. (2011) confirmed the durational reduction of repeated mentions of content words in read speech produced by native Korean and Chinese speakers of English, Rodríguez Cuadrado (2013) used both read speech and short spontaneous utterances to investigate several phonetic parameters in repeated mentions of words in Spanish spoken by native English speakers. The results of this study showed that non-natives produce second mentions of words with shorter durations, but also with reduced intensity, mean pitch, pitch excursion, and pitch range.

The present study addresses the issue of repeated mention reduction by comparing the English produced by native and non-native (Czech and Norwegian) speakers. The material consists of spontaneous conversations elicited using an interactional task. The investigation focuses on durational, rhythmic, and spectral aspects of reduction. In the light of the previous findings, it is hypothesized that

the non-natives will reduce their repeated mentions along some of the dimensions in a similar manner to native speakers. On the other hand, differences in certain phonological properties between the speakers' native language (L1) and L2 may be expected to lead to deviations in some of the aspects. In addition to inspecting the influence of word repetitions by a given speaker, the overall status of words as new or given within the dialogue was included in the analysis as a control factor. The results reported in this paper are based on a part of the author's doctoral dissertation (Spilková 2014).

## 2. Method

### 2.1 Speakers

The study used speech material obtained from 10 native British English speakers, 10 Czech speakers, and 10 Norwegian speakers. As a result of the differences in the system of English instruction between Norway and the Czech Republic, attention was paid to selecting speakers from well-suited groups with regard to their English proficiency (e.g., the Czech speakers were mostly university students of English). In addition, the speakers were informed about the demands of the conversational task they were supposed to perform in English as their L2 prior to the recording. More details about the speakers can be found in Spilková (2014).

### 2.2 Speech Material

The material used in this study consisted of spontaneous dialogues in English. The dialogues were elicited using an interactional task in which one of the speakers describes a cartoon illustration to the other speaker, who attempts to draw it on a blank sheet of paper (a "replication task"; for details see Spilková et al. 2010; Spilková 2014).

### 2.3 Selected Items

The lexical items investigated in this study were all nouns denoting objects discussed as part of the conversational task. In order to keep the sample being studied homogeneous, a number of items were excluded, such as words occurring in isolation or containing a disfluency or a mispronunciation. Four different lexical items per speaker were selected where possible. For each lexical item, the speaker's first production of that word (first mention) and two later productions of the same word by the same speaker further on in the dialogue (repeated mentions) were included. It must be noted that not all of the first productions of a word by a speaker were the first occurrences of the word in the dialogue. The three selected tokens per lexical item uttered by the same speaker will be referred to as a *triplet*. Table 1 lists the number of triplets selected for each speaker group.

| Language | Speakers' L1 | Number of triplets |
|----------|--------------|--------------------|
| English  | English      | 35                 |
| English  | Czech        | 31                 |
| English  | Norwegian    | 36                 |

**Table 1.** Numbers of triplets (lexical items in three repetitions produced by the same speaker) selected for each speaker group.

## 2.4 Acoustic Analyses

The selected items were annotated and processed using Praat (Boersma and Weenink 2009). For each item, word boundaries and a stable portion within the vowel of the primary stressed syllable were annotated. In polysyllabic words, additional annotations were made to obtain the duration of the primary stressed syllable and the number of syllables. Using these annotations, the word durations, the durations of primary stressed syllables and unstressed syllables (in polysyllabic words), and the values of the first two formants in the stable portion of the vowel in the primary stressed syllable were obtained. The following measures were used to investigate the effect of repeated mention:

- *word duration* in milliseconds;
- *unstressed-to-stressed syllable duration ratio* (in polysyllabic words): the ratio of the mean duration of syllables without primary stress to the duration of the primary stressed syllable;
- *vowel distance to the centroid* (in stressed syllables): a Euclidean distance in the F1-F2 formant space in Bark between the formant values of the given vowel and the values of a gender-specific centroid (i.e., a vowel-space center calculated using reference values by Deterding 1997).

## 2.5 Control Factor *Discourse Status*

In addition to the overall analysis, the effect of one discourse-related control factor was taken into consideration. In particular, it was considered relevant to investigate whether the speaker's first mention of a word was the first occurrence of the word within the dialogue. As has been noted previously, in some cases the speaker's first production of a word was preceded by the production of the same word by the other speaker. A binary variable *discourse status* coded for each triplet whether its first member was the first occurrence of the word within the dialogue (dialogue-initial triplets) or whether the word had been produced previously by the other speaker. The number of dialogue-initial triplets and their percentages within the total number of triplets in each group based on speakers' L1 are listed in Table 2.

| Language | Speakers' L1 | Number of triplets | Dialogue-initial (triplets) | Dialogue-initial (%) |
|----------|--------------|--------------------|-----------------------------|----------------------|
| English  | English      | 35                 | 21                          | 60                   |
| English  | Czech        | 31                 | 22                          | 71                   |
| English  | Norwegian    | 36                 | 27                          | 75                   |

**Table 2.** Total numbers of triplets, and numbers and percentages of dialogue-initial triplets for each speaker group.

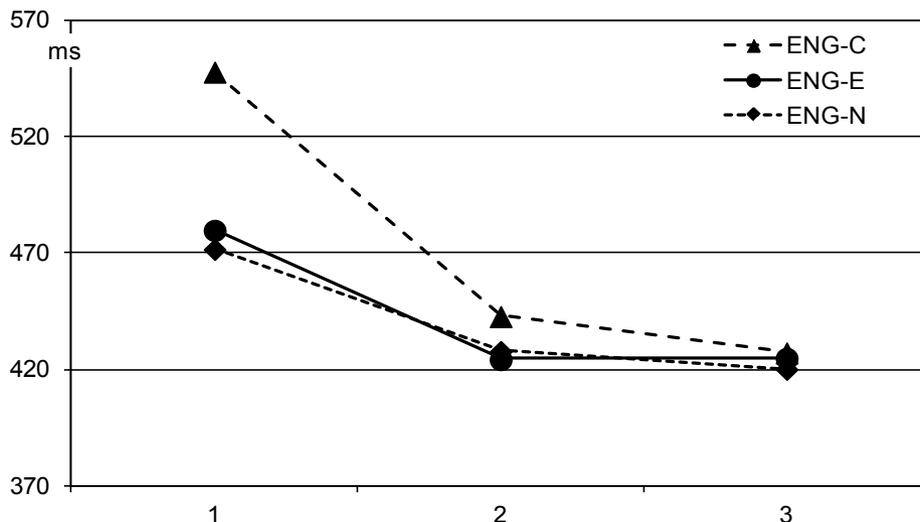
## 2.6 Statistical Analyses

Statistical analyses were carried out in the statistical software SPSS for Windows (SPSS 2006) using repeated measures ANOVA with repeated mention as the within-group factor and the grouping based on speakers' L1 as the between-group factor.

## 3. Results

### 3.1 Durational Reduction of Repeated Mentions

The mean word durations in the first and repeated mentions of English words uttered by the native English speakers and by the Czech and Norwegian speakers are displayed in Figure 1. It can be observed that the durations of the repeated mentions of words were shorter than their first mentions (pooled across the speaker groups, 498 ms for the first mention and 431 ms and 424 ms for the two repeated mentions). The durations of the first mentions produced by the Czech speakers were somewhat longer compared to the first mentions of the items uttered by the other two groups, while the mean durations of the subsequent mentions of the words were very similar across the speaker groups. A repeated-measures ANOVA with repeated mention as the within-group factor and speakers' L1 as the between-group factor showed a significant effect of repeated mention ( $F(2, 198) = 17.6$ ;  $p < 0.001$ ), but neither the speakers' L1 nor its interaction with repeated mention reached significance ( $F(2, 99) < 1$  and  $F(4, 198) = 1.42$ ;  $p = 0.229$ , respectively). The lack of significant interaction may possibly be attributed to the large dispersion of the durational values. The tests of within-subjects contrasts showed that the duration of both the second and third successive mentions of the word differed significantly from the first mention ( $F(1, 99) = 22.3$ ;  $p < 0.001$  and  $F(1, 99) = 25.7$ ;  $p < 0.001$ , respectively).



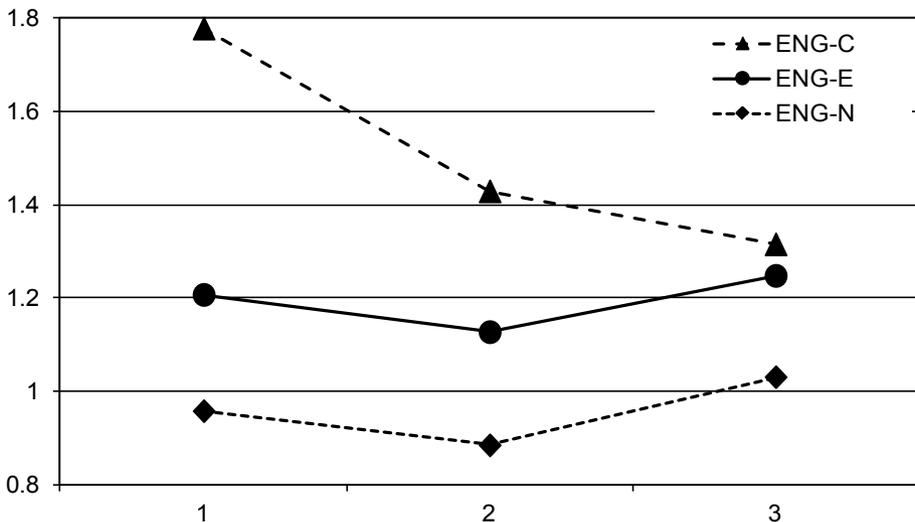
**Figure 1.** Mean durations (in ms) of the first mention and two repeated mentions of content words in the English spoken by the native speakers (ENG-E), Czech speakers (ENG-C), and Norwegian speakers (ENG-N).

### 3.2 Rhythmic Aspect of Reduction of Repeated Mentions

To inspect the rhythmic aspect of the reduction of repeated mentions of words, the measure of the unstressed-to-stressed syllable duration ratio was used. Figure 2 shows the ratios in the three mentions of English words spoken by the Czech, Norwegian, and native English speakers. Surprisingly, the ratios are mostly higher than one, indicating that overall in the (polysyllabic) content words that were investigated, unstressed syllables had longer durations than the syllable with primary stress. Only the items in English produced by the Norwegian speakers appear to have on average approximately equal durations of stressed and unstressed syllables. This unexpected result may be caused by a bias caused by the syllable structures of some of the lexical items represented in the sample, in particular the items with relatively complex unstressed or secondary stressed syllables and a simple primary stressed syllable. For a better overview, all the monosyllabic and polysyllabic words included in the samples for the three speaker groups are listed in Appendix 1. A closer inspection of the data confirmed that a rather small subset of items influenced the overall values of the unstressed-to-stressed syllable duration ratio. The actual values of the rhythm-related measure were, however, not considered relevant to the objectives of the investigation.

In Figure 2, apart from differences between the unstressed-to-stressed ratios in the different speaker groups based on speakers' L1 (1.51, 1.19, and 0.98 for the English items produced by the Czech, English, and Norwegian speakers, respectively), a differing pattern of unstressed-to-stressed ratio values in the first and repeated mentions in the three groups based on the speakers' L1 can be observed. While in the English items uttered by the natives

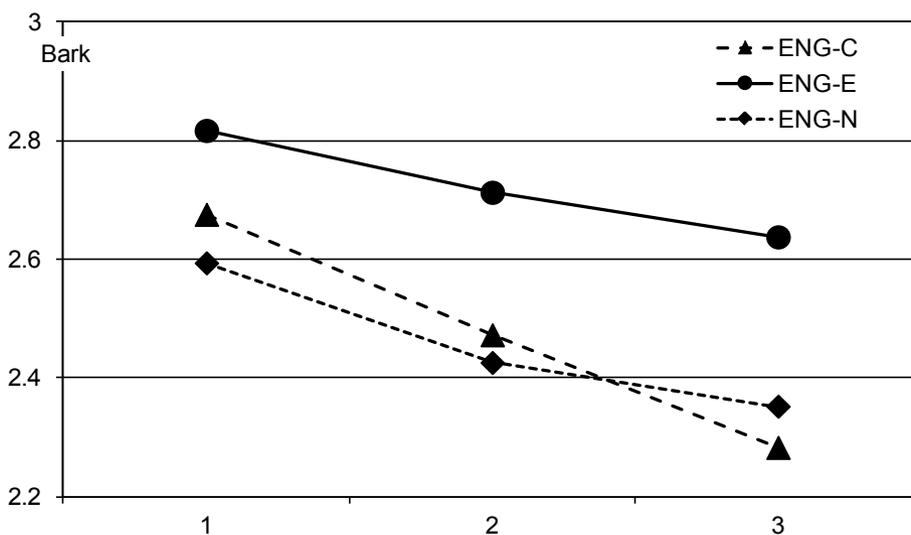
and Norwegian speakers the unstressed-to-stressed syllable duration ratio does not change much between the first and the two repeated mentions, the Czech speakers have noticeably higher ratio values in the first mentions of the words. A repeated-measures ANOVA with repeated mention as the within-group factor and the speakers' L1 as the between-group factor showed that neither the main effects nor their interaction reached significance ( $F(2, 72) = 2.19$ ;  $p = 0.119$ ,  $F(2, 36) = 1.90$ ;  $p = 0.164$  and  $F(4, 72) = 2.24$ ;  $p = 0.074$ , respectively). However, when only the contrast between the first and third mentions of the word was inspected, a significant interaction was found ( $F(2, 36) = 4.61$ ;  $p = 0.017$ ). As can be observed in Figure 2, this interaction seems to be due to the Czech speakers' considerable drop in unstressed-to-stressed syllable duration ratio values between the first and third mentions of the words under study as compared to the stable unstressed-to-stressed syllable duration ratios across all three mentions of the words in the items produced by the native English speakers and Norwegian speakers. These findings indicate that in the Czech speakers' English production it was particularly the unstressed syllables of polysyllabic words that were prone to massive lengthening in their first mentions, possibly as a result of final lengthening. Such a noticeable effect may be explained by an effort to hyperarticulate the first mention of a word, or may be an indication of uncertainty in production. The items produced by the native English speakers and Norwegian speakers, on the other hand, did not follow this pattern, implying that any shortening (or lengthening) effect was spread evenly across stressed and unstressed syllables in the word.



**Figure 2.** Unstressed-to-stressed syllable duration ratios in the first mention and two repeated mentions of polysyllabic content words in English spoken by the native speakers (ENG-E), Czech speakers (ENG-C), and Norwegian speakers (ENG-N).

### 3.3 Spectral Reduction of Repeated Mentions

In this section, the measure of the distance to the centroid was used, expressing the degree of centralization of the vowel in the stressed syllable. This measure was only calculated in items containing a suitable monophthong in their stressed syllable. Figure 3 shows the mean distance to the centroid in the stressed vowels of the three mentions of English words spoken by the Czech, Norwegian, and native English speakers. A slight but consistent decrease in the values in the repeated mentions of the words can be observed, indicating that the vowel qualities become more central in the repeated mentions, compared to the words' first mentions. The mean value of the distance to the centroid was 2.7 Bark for the first mentions and 2.6 and 2.5 Bark for the two repeated mentions, respectively.

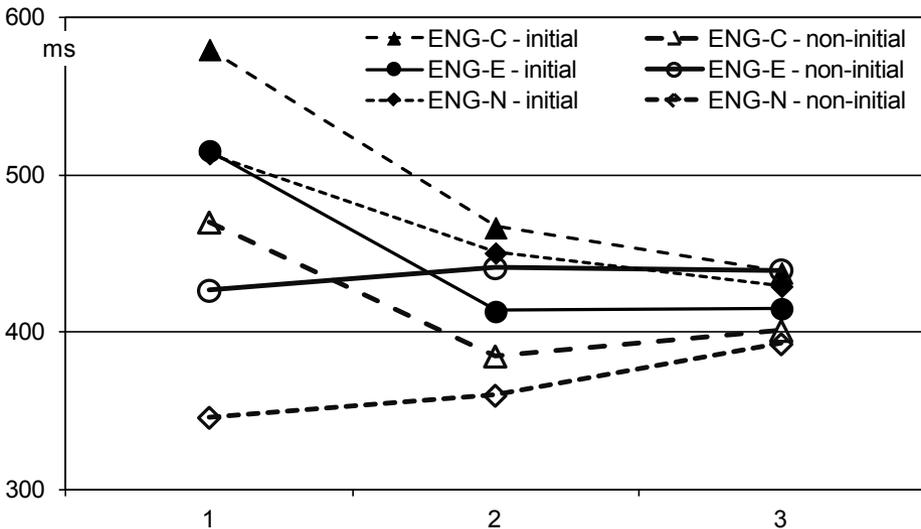


**Figure 3.** Mean distance to the centroid (in Bark) for stressed vowels in the first mention and two repeated mentions of content words in English spoken by the native speakers (ENG-E), Czech speakers (ENG-C), and Norwegian speakers (ENG-N).

A repeated-measures ANOVA with repeated mention as the within-group factor and speakers' L1 as the between-group factor showed a significant effect of the repeated mention ( $F(2, 122) = 6.89$ ;  $p = 0.001$ ) but neither the speakers' L1 nor its interaction with the repeated mention reached significance ( $F(2, 61) < 1$  and  $F(4, 122) < 1$ , respectively). Tests of within-subjects contrasts showed that the distance to the centroid in both the second and third successive mentions of the word differed significantly from the first mention ( $F(1, 61) = 4.24$ ;  $p = 0.044$  and  $F(1, 61) = 11.5$ ;  $p = 0.001$ , respectively).

### 3.4 Effect of Discourse Status

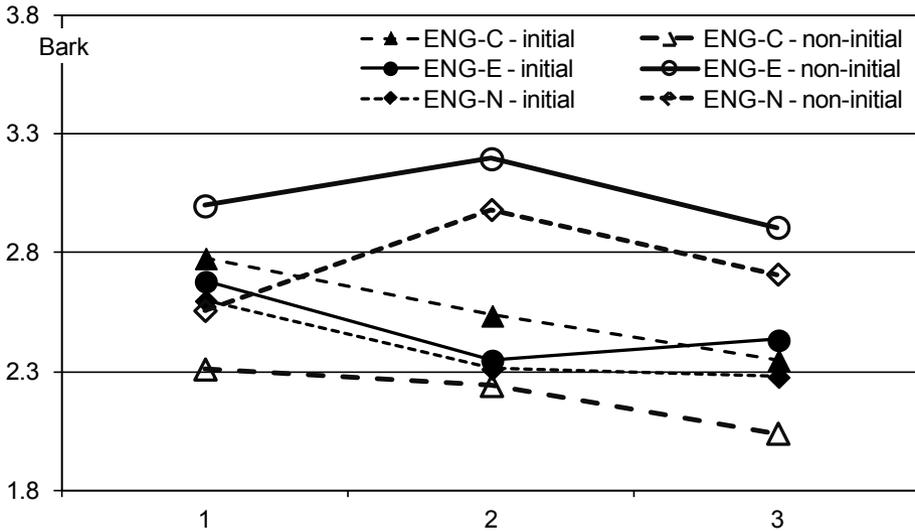
The analyses using the control factor discourse status allowed us to determine whether the speaker's repeated mentions are treated differently in dialogue-initial triplets than in cases where the word had occurred previously in the dialogue (cf. Section 2.5). These analyses included item duration and the vowel distance to the centroid. Figure 4 shows the mean word durations in the first mention and two repeated mentions of English words uttered by the Czech, Norwegian, and native English speakers, depending on the discourse status of the triplets. A clear tendency to durational reduction of the repeated mentions in the dialogue-initial triplets (represented with closed markers) can be observed. Pooled across the groups based on the speakers' native language, the mean durations in the dialogue-initial triplets were 535 ms for the first mentions vs. 445 ms and 428 ms for the two repeated mentions, respectively. On the other hand, the word durations in the three mentions in the non-initial triplets (represented with open markers) were rather stable (pooled across the groups based on the speakers' native language, 416 ms for the first mentions vs. 402 ms and 416 ms for the two repeated mentions, respectively). It is also apparent that the tendency to stable item durations of the three mentions in the non-initial triplets is not followed by the group of items uttered by the Czech speakers (with a mean duration of 470 ms for the first mention vs. 385 ms and 401 ms for the two repeated mentions, respectively).



**Figure 4.** Mean durations (in ms) in the first mention and two repeated mentions of content words in English spoken by the native speakers (ENG-E), Czech speakers (ENG-C), and Norwegians (ENG-N), depending on the discourse status of the triplets.

A repeated-measures ANOVA with repeated mention as the within-group factor and speakers' L1 and discourse status as the between-group factors showed significant effects of repeated mention ( $F(2, 192) = 9.22$ ;  $p < 0.001$ ), and discourse status ( $F(2, 96) = 6.32$ ;  $p = 0.014$ ) and a significant interaction of repeated mention and discourse status ( $F(2, 192) = 6.52$ ;  $p = 0.002$ ). The effect of the speakers' L1 and the other interactions did not reach significance. It may be assumed that the overall effect of discourse status, as well as the interaction with repeated mention, is largely due to the considerable difference in the durations of the first members of the triplets, depending on whether the triplet was dialogue-initial or not. The tokens selected as the second and third mentions of the words by the speaker show much less noticeable differences as a result of the triplet's discourse status. In order to describe the interaction of the discourse status and repeated mentions in more detail, a separate repeated-measure ANOVA for each of the three observed speaker groups based on the speakers' L1 background, was carried out. These analyses confirmed that while in the English produced by the natives and Norwegian speakers there is a significant interaction of discourse status and repeated mention ( $F(2, 66) = 3.49$ ;  $p = 0.036$  and  $F(2, 68) = 5.34$ ;  $p = 0.007$  for the two speaker groups, respectively) and no main effect of repeated mention ( $F(2, 66) = 2.02$ ;  $p = 0.141$  and  $F(2, 68) < 1$  for the two speaker groups, respectively), in the English produced by the Czech speakers, item duration is only affected by repeated mention ( $F(2, 58) = 6.74$ ;  $p = 0.002$ ) without a significant interaction with the discourse status ( $F(2, 58) < 1$ ). This interesting finding can be interpreted as the Czech speakers' tendency to more mechanical durational reduction of words, once they are produced again by the same speaker, as opposed to the English and Norwegian speakers applying reduction selectively, depending on the overall status of the word within the dialogue.

Figure 5 displays the mean vowel distance to the centroid in the first mention and two repeated mentions of the English words uttered by the Czech, Norwegian, and native English speakers, depending on the discourse status of the triplets. It can be observed that the dialogue-initial triplets show a slight decrease in the mean distance to the centroid in the repeated mentions, as compared to the first mentions, while no difference between the first and repeated mentions in the non-initial triplets can be observed. A repeated-measures ANOVA with repeated mention as the within-group factor and speakers' L1 and discourse status as the between-group factors showed only a significant interaction of repeated mention and discourse status ( $F(2, 116) = 3.63$ ;  $p = 0.030$ ). The main effects of repeated mention, speakers' L1, and discourse status, as well as the other interaction, did not reach significance.



**Figure 5.** Mean distance to the centroid (in Bark) for stressed vowels in the first mention and two repeated mentions of content words in English spoken by the native speakers (ENG-E), Czech speakers (ENG-C), and Norwegian speakers (ENG-N), depending on the discourse status of the triplets.

#### 4. Conclusions

The results showed a consistent durational and spectral reduction of the repeated mentions of content words in the English produced by the native speakers, as well as in the English spoken by the Czech and Norwegian speakers. The repeated mentions of words were generally shorter and contained more centralized vowels in their stressed syllables compared to the first mention of the word. This finding, confirming the universality of the tendency to reduce more predictable words, is in line with the predictions of Lindblom's (1990) H&H theory and is consistent with the results of previous research (Baker et al. 2011; Rodríguez Cuadrado 2013). Moreover, the present study confirms these tendencies to reduction in spontaneous task-based dialogues, thus extending the validity of previous findings beyond read speech and brief spontaneous utterances to less controlled spontaneous materials.

The rhythm-related measure, the unstressed-to-stressed syllable duration ratio (in polysyllabic words), was generally found to remain constant across the repeated mentions, indicating that any durational differences between the first and repeated mentions of words are distributed proportionally across the stressed and unstressed syllables. However, a significant interaction of repeated mention and speakers' L1 background was revealed. This interaction was due to the Czech speakers' unusually long unstressed syllables and resulting higher unstressed-to-stressed syllable duration ratios in the first

mentions of words, contrasting with the stable ratio values across the repeated mentions in the productions of the native and Norwegian speakers of English. This peculiar rhythmic pattern of the Czech speakers' hyperarticulation of the first mentions of polysyllabic words in English is probably due to substantial differences in the phonological properties related to rhythm type between Czech and English and Norwegian (cf. Spilková 2014, 52–54).

The analyses, which included a control factor discourse status, allowed us to refine the findings by considering not only the repetitions of words by a given speaker but also the overall status of words within the dialogue. The results showed that an interaction of the factors of repeated mention and discourse status affected both word duration and spectral contrast. The interaction indicates that durational and spectral reduction occurs particularly in the repeated mentions of dialogue-initial triplets. The triplets where the word had previously been produced by the other speaker, on the other hand, do not show a significant tendency to reduction. This pattern of reduction adjustment in relation to the overall discourse status is consistent with the findings of Bard et al. (2000), who showed shortening and a decrease in intelligibility when a word was mentioned for a second time, regardless of which participant produced the first mention. An exception from this pattern was, however, revealed in the English spoken by the Czech speakers. The Czech speakers' English production shows durational reduction even in triplets that were not dialogue-initial. This may indicate the Czech speakers' limited ability to adjust the durational properties in their English production in relation to the word's overall discourse status, resulting in a more mechanical durational reduction of words once they are produced repeatedly by the same speaker.

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## Appendix 1

Lists of monosyllabic and polysyllabic words included in the samples for the three speaker groups

| Language | L1        | Monosyllabic |       |        | Polysyllabic |                |
|----------|-----------|--------------|-------|--------|--------------|----------------|
| English  | English   | bar          | horse | shed   | beachballs   | merry-go-round |
|          |           | bath         | hose  | square | corner       | mirror         |
|          |           | door         | pigs  | stall  | fascia       | quarters       |
|          |           | dot          | plug  | tail   | handle       | TV             |
|          |           | duck         | pump  | tap    | letterbox    |                |
|          |           | goose        | roof  | zed    | L-shape      |                |
| English  | Czech     | ball         | lamp  | snake  | animals      | railway        |
|          |           | cans         | pigs  | store  | armchair     | table          |
|          |           | dog          | room  | tins   | corner       | window         |
|          |           | door         | shop  | toys   | elephant     | woman          |
|          |           | fork         | sink  | walls  | mirror       |                |
| English  | Norwegian | back         | leg   | shoes  | balloons     | toilet         |
|          |           | booth        | legs  | sink   | bucket       | window         |
|          |           | door         | line  | snake  | carousel     | woman          |
|          |           | drain        | pegs  | tap    | harmonica    |                |
|          |           | fork         | poles | track  | locomotive   |                |
|          |           | hand         | roof  | train  | piping       |                |
|          |           | horse        | seat  | wall   | rhino        |                |



# The Utterance-Final Glottalization in Taiwanese Mandarin: Interaction between Tone and Intonation

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**Abstract:** The study investigated the influence of inter-speaker differences, gender, rimes, tones, and intonation on the occurrence of Taiwanese Mandarin utterance-final glottalization. Statistical analyses showed that while there was no significant influence of speakers, gender, and rimes on glottalization, tones were highly correlated with it in utterance-final positions. To be specific, tone 3 and tone 4 were glottalized much more often than the other two tones in declaratives but all the tones tended not to be glottalized in interrogatives. Moreover, penultimate tone 3 in declaratives was found to be glottalized very often, while penultimate tone 4 was only sparsely glottalized. We conclude that low pitch plays a crucial role in the occurrence of utterance-final glottalization and this effect is magnified by the falling intonation of declaratives and minimized by the rising intonation of interrogatives.

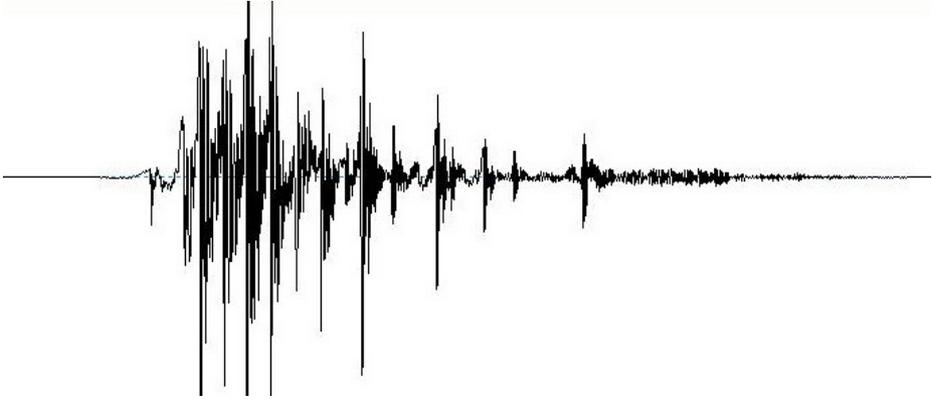
**Keywords:** glottalization; utterance-final; tone; intonation; Taiwanese Mandarin.

## 1. Introduction

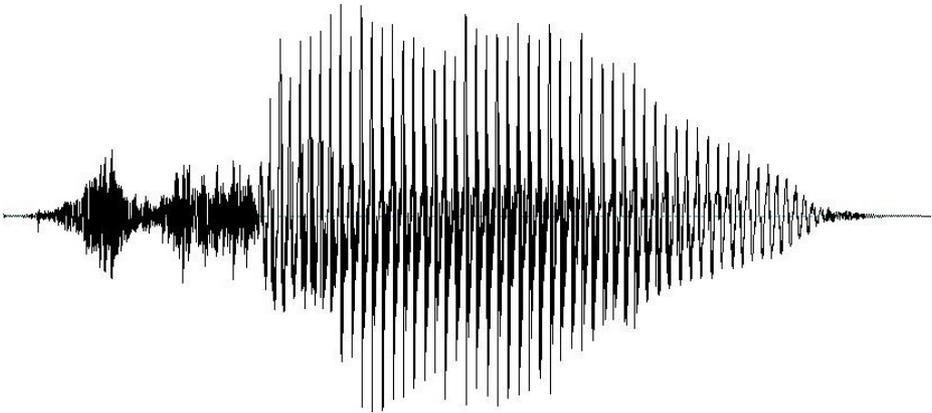
### 1.1 Glottalization and Its Locations

Glottalization is a state of phonation also referred to as *creaky voice* or *laryngealization* (Ding et al. 2004, 37), which, according to Ladefoged and Maddieson (1996, 48), has a configuration where the vocal folds vibrate anteriorly while the arytenoid cartilages are pressed together. Acoustically, glottalization is characterized by longer and/or irregular

glottal pulses (e.g., Pierrehumbert and Talkin 1992; Dilley et al. 1996),<sup>1</sup> as shown in Figure 1. In contrast, a syllable with modal voice (Figure 2) shows no such irregular pulses.



**Figure 1.** Syllable with glottalization (pa<sup>21</sup> “handle” by female speaker no. 5).



**Figure 2.** Syllable without glottalization (ts<sup>ha55</sup> “to wipe” by female speaker no. 5).

Glottalization often accompanies plosives, word-initial vowels, and utterance- or phrase-final syllables (Kohler 1996). A glottalized plosive is said to be produced with a glottal stop, whose production involves a continuum from glottalization to a complete

<sup>1</sup> Glottalization may also refer to the complete closure of the glottis, i.e., a glottal stop, accompanying the production of obstruents, plosives in particular. For example, the final /t/ of the word *bat* can be glottalized as [tʰ]. This type of glottalization is also referred to as pre-glottalization or glottal reinforcement. In this study, the term “glottalization” refers only to a period of longer and/or irregular glottal pulses.

glottal closure (Ladefoged and Maddieson 1996; Docherty and Foulkes 1995; Docherty et al. 1997). Longer or irregular glottal pulses can thus be observed in the vowels adjacent to such plosives (e.g., Hoffmann 2005).

The occurrence of glottalization in word-initial vowels has been related to the boundary of intonational phrases (Pierrehumbert and Talkin 1992) and pitch accent (Dilley et al. 1996). Moreover, this type of glottalization may result from the insertion of a glottal stop before word-initial vowels, which is regarded as a common way to avoid onsetless syllables (Kenstowicz and Kisseberth 1979; Kenstowicz 1994).

The glottalization of utterance-/phrase-final syllables tends to occur when the glottal area increases and the subglottal pressure decreases (Slifka 2000; 2006), i.e., when the speech mechanism is about to rest. Slifka (2007) related this to the glottalization accompanying plosives and concluded that irregular phonation served as a cue for silence. As for its function, utterance-final glottalization was found to serve as a cue for familiar speaker recognition (Böhm 2006; Böhm and Shattuck-Hufnagel 2007).

## 1.2 Factors That Influence Glottalization

Several factors have been reported to influence the occurrence of glottalization. This section presents a brief review of the following factors: speakers, gender, pitch, and vowel height.

The rate of glottalization has been observed to vary across speakers. For instance, the five radio announcers in (Dilley et al. 1996) exhibited 13% to 44% glottalization rates on word-initial vowels. In Slifka's (2000) study, the four speakers showed 5%, 37%, 93%, and 95% utterance-final glottalization. She further noted that speakers of American English seem to have their own preference for the use of glottalized voice. Some prefer regular endings in phrases and utterances; others prefer irregular ones.

Gender has also been referred to as one of the factors conditioning glottalization. For British English, Esling (1978), Stuart-Smith (1999), and Henton and Bladon (1987) reported that male speakers used glottalized voice much more often than females.<sup>2</sup> This pattern can be interpreted as a representation of masculinity because glottalization is often characterized by low pitch (see below) and men generally have lower pitch than women (Podesva 2013, 427). However, more recent studies on Northern American English (e.g., Yuasa 2010; Podesva 2013; Podesva and Szakay 2013) indicated that female speakers glottalized more than males. Yuasa (2010) suggested that glottalized voice quality enabled women to sound more professional.

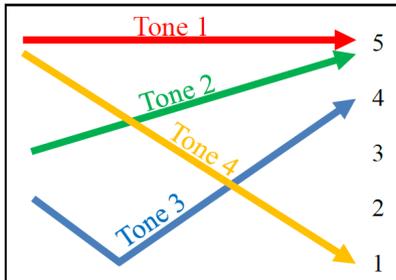
<sup>2</sup> Esling (1978) and Stuart-Smith (1999) focused on the English varieties in Edinburgh and Glasgow, respectively. The varieties studied by Henton and Bladon (1988) were Received Pronunciation (RP) and Modified Northern.

Glottalization is often accompanied by a very low pitch, or fundamental frequency ( $F_0$ ) (Ladefoged 1971; Pierrehumbert and Talkin 1992). In natural languages,  $F_0$  manifests itself as *intonation* when denoting different functions of phrases or utterances, and as *tone* when used to contrast lexical meanings. Therefore, intonation and tones also serve as factors that influence glottalization.

Although few, if any, studies have explored the effect of vowels on glottalization, vowel height is a potential factor because it has been reported that low vowels have a lower  $F_0$  (House and Fairbanks 1953; Peterson and Barney 1952) and glottalized vowels tend to be perceived as being lower in quality (Brunner and Żygis 2011).

### 1.3 Mandarin Tones and Intonation

Mandarin Chinese has four tones, as shown in Figure 3. The tones are marked by the digits 1 to 5, with 1 representing the lowest pitch and 5 the highest. Tone 1 is high level, tone 2 high rising, tone 3 dip-rise, and tone 4 high falling. They can be exemplified by  $ma^{55}$  “mother,”  $ma^{35}$  “numb,”  $ma^{215}$  “horse,” and  $ma^{51}$  “to scold,” respectively. In Taiwanese Mandarin, tone 3 is produced with a complete dip-rise contour *214* only when emphasized; otherwise it is made with only the dip part *21*.



**Figure 3.** Mandarin tones.

The intonation of Mandarin utterances can generally be categorized into *rising* and *falling*. The former is used for interrogatives without final particles and the latter for declaratives. These intonation contours are said to be added simultaneously onto the syllabic tones of the utterances (Chao 1933) and were described by Chao (1968) as “small ripples (syllabic tones) riding on large waves (intonation).” Such simultaneous addition has been supported by several studies (e.g., Shen 1989; He and Jin 1992; Shi et al. 2009) and has been attributed to the influence of a final *high* or *low* boundary tone (Hu 1987; Lin 2006), which influences the pitch range of the syllabic tones. In addition, intonation has the greatest influence on the final syllabic tone. In other words, the overall pitch range of the final syllable is raised in interrogatives and lowered in declaratives (Wang and Shi 2010).

## 1.4 Glottalization in Mandarin Chinese.

There are relatively few studies involving glottalization in Mandarin Chinese, among which Ding et al. (2004) is a rather detailed acoustic study. They asked eight speakers from different regions of China, four male and four female, to read 400 isolated syllables (100 for each tone) and natural texts which were targeted only at tone 3. Their major findings include:

- the glottalization rate varied across the speakers;
- glottalization tended to occur in tone 3 and tone 4;
- the glottalization of tone 3 occurred in the middle part of the syllable and at the end of tone 4;
- the local accent and gender had little influence on the occurrence of glottalization.<sup>3</sup>

These findings reflected the close relation between a low  $F_0$  and glottalization. Tone 3 and tone 4 are the only two tones that involve the lowest  $F_0$  (marked with *l*) and the middle of tone 3 and the end of tone 4 are exactly where the  $F_0$  lowers. However, the possible influence of intonation was left unconsidered.

## 1.5 Purpose of the Study

This study investigated the effect of speakers, gender, tone, intonation, and vowel height on utterance-final glottalization in Taiwanese Mandarin. It aimed to find out how these factors influence the glottalization of utterance-final syllables and how they may interact. In addition, this study also intended to discover if glottalization behaves similarly in Taiwanese Mandarin and other languages.

## 2. Method

### 2.1 Speakers and Materials

Thirty speakers of Taiwanese Mandarin, 15 males and 15 females, whose ages ranged from 30 to 50, were recruited for this study. They had no known hearing or speech defects and they were all bilingual in Mandarin and Southern Min.

A total of 180 disyllabic words or phrases were selected (three words ending in each of the four tones from 15 rimes:<sup>4</sup>  $3 \times 4 \times 15 = 180$ , as listed in the appendix) and put

<sup>3</sup> The term “local accent” here refers to the regional variety of Mandarin Chinese, under the influence of the speaker’s local dialect.

<sup>4</sup> Pre-nuclear glides are not part of the rime (Duanmu 2007). There are 22 rimes in Taiwanese Mandarin. However, merger has been reported on the pairs [ʒ, ʒ̥] (Duanmu 2007), [in, in̥] (Hsu and Tse 2007), and [ən, ən̥] (Hsu and Tse 2007). These six were excluded to avoid unnecessary variation. Moreover, the rime [yn] was also excluded because only one non-archaic syllable could be found for tone 3: [tyn] “to fall,” and it never ends a disyllabic word or phrase. The 15 rimes left are [i], [u], [y], [a], [o], [ɤ], [e], [ai], [ei], [au], [ou], [an], [en], [aŋ], and [oŋ].

in the final position of a declarative sentence: *Wo hui shuo* \_\_\_\_\_. “I can say \_\_\_\_\_.” and an interrogative sentence: *Ni hui shuo* \_\_\_\_\_. “You can say \_\_\_\_\_?” so a list of 360 sentences was compiled. The speakers were asked to read the list loud and steady at a normal speed, and were recorded using a Sony ICD-SX1000 PCM recorder, in a quiet room.

## 2.2 Data Analysis

The recorded *wav* files were analyzed in *Praat* (Boersma and Weenink 2013). A syllable was counted as glottalized if irregular glottal pulses were observed. However, a sandhi process in Taiwanese Mandarin may complicate the matter. As reported in Lo (2004), many speakers produce utterance-final tone 2 as tone 3, as illustrated in Figure 4 by our male speaker 13. The second syllable *tʰi<sup>35</sup>* was produced with a falling contour. To reduce confusion, glottalization in a changed tone 2 was not counted.



Figure 4. xɤ<sup>35</sup> tʰi<sup>35>21</sup> “river bank.”

Each occurrence of glottalization was marked with gender, speaker, rimes, tones, and sentence types (declarative or interrogative). The study originally focused only on utterance-final syllables. In the course of the analysis, however, penultimate tone 3 and tone 4 syllables were found to behave distinctly in terms of glottalization. Therefore, these syllables were also included in the analysis. The relation between the factors and the rate of glottalization were tested by one-way ANOVA on SPSS.<sup>5</sup>

5 Factorial (multi-way) ANOVA was first run to see if the interaction(s) of the factors had a significant effect on the occurrence of glottalization. However, the statistics of the interactions involving *speaker* and *gender* cannot be calculated. As a result of the structure of our data, the crosstab of *speaker\*gender* contains 30 empty cells because the category of one sex does not contain data from the 15 speakers of the opposite sex. ANOVA cannot deal with data with empty cells. Moreover, the statistics of the interaction of *speaker\*rime\*tone* cannot be calculated, either. Each cell of their crosstab contains only one data point (i.e., the number of occurrences of glottalization) but at least two data points are needed to run factor interaction in factorial ANOVA. As a result, only the interactions of *gender\*tone\*rime*, *gender\*rime*, *gender\*tone*, *rime\*tone*, *speaker\*rime*, and *speaker\*tone* were tested and all the results showed no significance, as presented in Appendix 2.

### 3. Results and Discussion

#### 3.1 Utterance-Final Syllables

##### 3.1.1 Gender

Table 1 shows the number of utterance-final glottalizations produced by the male and female speakers. Statistical analysis showed that gender was not significantly correlated with the rate of glottalization in either declaratives (ANOVA,  $p = 0.81 > 0.05$ ) or interrogatives (ANOVA,  $p = 0.88 > 0.05$ ). In other words, both the male and female speakers tended to glottalize the final syllables in declaratives but they tended not to do so in interrogatives. While this result coincides with that of Ding, Jokisch, and Hoffmann (2004), it is inconsistent with most of the studies, which found that gender has a significant influence on glottalization (see Section 1.2).

|                       | Male  | Female |
|-----------------------|-------|--------|
| <b>Declaratives</b>   | 1,323 | 1,338  |
| <b>Interrogatives</b> | 23    | 22     |

**Table 1.** Number of glottalized tokens.

The reason may lie in the difference between tone and non-tone languages. As discovered by Ding et al. (2004) and the present study (see below), speakers tended to glottalize tone 3 and tone 4 at the point of the lowest pitch level. Since Mandarin Chinese is a tone language, speakers have to maintain the distinctive function of the four tones for successful communication. To do this, both male and female speakers need to lower the pitch in tone 3 and tone 4, which explains why the men and women behaved similarly on glottalization.

##### 3.1.2 Speakers

Inter-speaker difference, like gender, did not play a role in glottalization. The number of glottalizations produced by each speaker is presented in Table 2. Statistical analysis showed that there was no significant inter-speaker difference (ANOVA,  $p = 1.00 > 0.05$  for declaratives; Brown-Forsythe,  $p = 0.994 > 0.05$  for interrogatives),<sup>6</sup> which contradicts the findings of most previous studies, in which the glottalization rate is highly speaker-dependent. In view of the fact that none of them focused on Taiwanese Mandarin, this result may reflect one of the characteristics of the language, or at least a preferable way of speaking among the speakers in Taiwan. However, larger-scale studies are needed to shed light on this issue.

<sup>6</sup> The  $P$  value of the Brown-Forsythe test is reported when there was no homogeneity of variances.

|                       | 1         | 2         | 3         | 4         | 5         | 6         | 7         | 8         | 9         | 10        |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Declaratives</b>   | 84        | 90        | 90        | 90        | 88        | 87        | 88        | 87        | 90        | 89        |
| <b>Interrogatives</b> | 3         | 1         | 2         | 3         | 1         | 3         | 1         | 1         | 1         | 1         |
|                       | <b>11</b> | <b>12</b> | <b>13</b> | <b>14</b> | <b>15</b> | <b>16</b> | <b>17</b> | <b>18</b> | <b>19</b> | <b>20</b> |
| <b>Declaratives</b>   | 86        | 88        | 88        | 88        | 90        | 90        | 86        | 88        | 87        | 89        |
| <b>Interrogatives</b> | 2         | 1         | 1         | 1         | 1         | 1         | 1         | 2         | 1         | 2         |
|                       | <b>21</b> | <b>22</b> | <b>23</b> | <b>24</b> | <b>25</b> | <b>26</b> | <b>27</b> | <b>28</b> | <b>29</b> | <b>30</b> |
| <b>Declaratives</b>   | 92        | 89        | 90        | 90        | 90        | 89        | 90        | 89        | 89        | 90        |
| <b>Interrogatives</b> | 2         | 2         | 1         | 1         | 4         | 1         | 1         | 1         | 1         | 1         |

**Table 2.** Number of glottalized tokens produced by each speaker.

### 3.1.3 Rimes (Vowel Height)

Table 3 below shows the number of glottalization occurring in different rimes. As can be seen, there seems to be little difference among the rimes. Statistically, the rimes had no significant influence on the occurrence of glottalization in either declaratives (ANOVA,  $p = 1.00 > 0.05$ ) or interrogatives (Brown-Forsythe,  $p = 0.376 > 0.05$ ). This means that different vowels and different vowel-nasal combinations had little effect on utterance-final glottalization. The  $F_0$  difference among vowels seemed to be too small to influence the rate of glottalization.

|                       | i   | u   | y   | a   | o   | ɤ   | e   | ai  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>Declaratives</b>   | 182 | 176 | 178 | 175 | 175 | 177 | 177 | 175 |
| <b>Interrogatives</b> | 3   | 3   | 6   | 3   | 3   | 1   | 2   | 2   |
|                       | ei  | au  | ou  | an  | en  | aŋ  | oŋ  |     |
| <b>Declaratives</b>   | 176 | 179 | 174 | 179 | 176 | 183 | 179 |     |
| <b>Interrogatives</b> | 8   | 2   | 3   | 2   | 2   | 2   | 3   |     |

**Table 3.** Number of glottalized rimes.

### 3.1.4 Tones

The number of glottalized tones is listed in Table 4. The tones showed significantly high correlation with the occurrence of glottalization in declaratives (ANOVA,  $p = 0.00 < 0.05$ ). In interrogatives, however, there was no significant correlation (Brown-Forsythe,  $p = 0.108 > 0.05$ ).

|                       | Tone 1 | Tone 2 | Tone 3 | Tone 4 |
|-----------------------|--------|--------|--------|--------|
| <b>Declaratives</b>   | 10     | 11     | 1,321  | 1,319  |
| <b>Interrogatives</b> | 7      | 10     | 18     | 10     |

**Table 4.** Number of glottalized tones.

A post-hoc test (Tukey HSD) indicated that, in declaratives, the correlation of tone 1 and tone 2 with the occurrence of glottalization was significantly different from that of tone 3 and tone 4 ( $p = 0.00 < 0.05$ ), as shown in Table 5. Tone 3 and tone 4 were thus much more often glottalized than the other two tones at the end of declaratives.

|                    | p value |
|--------------------|---------|
| <b>Tone1-Tone2</b> | 0.999   |
| <b>Tone1-Tone3</b> | 0.000   |
| <b>Tone1-Tone4</b> | 0.000   |
| <b>Tone2-Tone3</b> | 0.000   |
| <b>Tone2-Tone4</b> | 0.000   |
| <b>Tone3-Tone4</b> | 0.989   |

**Table 5.** Post-hoc Tukey HSD test results.

The cause of this difference lies in the pitch contours of tone 3 and tone 4. Tone 3 has a low dip contour *21* and tone 4 a high falling contour *51*. Further examination revealed that, as found in Ding et al. (2004), the glottalization of tone 3 began in the middle of the syllable and that of tone 4 occurred at the end. This suggests that lower intended pitch does contribute to the occurrence of glottalization. Furthermore, the fact that these two tones were only glottalized in declarative sentences suggests that the falling intonation of declaratives magnifies this effect while the rising intonation of interrogatives minimizes it.

### 3.2 Additional Finding: Penultimate Tone 3 and Tone 4

In the course of the data analysis, it was observed that penultimate tone 3 syllables also tended to be glottalized in declaratives (91%, 1,011 out of 1,110 tokens) and no significant difference was found in gender (ANOVA,  $p = 0.922 > 0.05$ ) and across speakers (Brown-Forsythe,  $p = 1.00 > 0.05$ ). In contrast, penultimate tone 4 syllables were glottalized only sparsely (0.9%, 10 out of 1,110 tokens). The effect of lower intended pitch on glottalization thus remained in penultimate tone 3 but nearly vanished in penultimate tone 4. Since the intonation has the greatest influence on the utterance-final syllable (Wang and Shi 2010), it seems that the help from the falling intonation is crucial for tone 4 to be glottalized. Therefore, if the digit *1* in Chinese tonal transcription represents a pitch low enough for glottalization to occur, non-final tone 4 may as well be transcribed as *53* and final tone 4 as *51*, as suggested in Duanmu (2007, 238).

## 4. Conclusion

This study investigated the influence of gender, speakers, rimes, tones, and intonation on the occurrence of utterance-final glottalization in Taiwanese Mandarin. The results showed that:

- neither gender nor rimes had any significant influence on the occurrence of glottalization;
- there was no significant inter-speaker variation;
- while tone 1 and tone 2 were generally not glottalized, tone 3 and tone 4 tended to be glottalized utterance-finally in declaratives, but not in interrogatives;
- the glottalization of tone 3 began in the middle of the syllable, while that of tone 4 occurred at the end;
- penultimate tone 3 and tone 4 were found to act differently—tone 3 was generally glottalized, whereas tone 4 was not.

At least four conclusions can be drawn from this study. First, low pitch plays a crucial role in the occurrence of utterance-final glottalization. Second, the falling intonation of declaratives increases the rate of glottalization in the final position, while the rising intonation of interrogatives reduces it. Third, the digit *l* in Chinese tonal transcription seems to represent a pitch low enough for glottalization to occur, so non-final tone 4 may as well be transcribed as *53* and final tone 4 as *5l*. Last, the results of this study may serve as characteristics that differentiate Taiwanese Mandarin from other Chinese dialects.

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## Appendix 1

The research stimuli are listed in the table below (transcription: IPA).

| Rime | Tone | Phrase                 |                    |    |
|------|------|------------------------|--------------------|----|
| i    | 1    | tɕiaŋ ti               | “lowering”         | 降低 |
|      |      | lou t <sup>h</sup> i   | “stairs”           | 樓梯 |
|      |      | lei tɕi                | “to cumulate”      | 累積 |
|      | 2    | fən li                 | “to part”          | 分離 |
|      |      | xɤ t <sup>h</sup> i    | “river bank”       | 河堤 |
|      |      | tʂʒ ti                 | “recorder”         | 直笛 |
|      | 3    | ʂən t <sup>h</sup> i   | “body”             | 身體 |
|      |      | joŋ tɕi                | “overcrowded”      | 擁擠 |
|      |      | mau pi                 | “Chinese brush”    | 毛筆 |
|      | 4    | t <sup>h</sup> u ti    | “land”             | 土地 |
|      |      | pi t <sup>h</sup> i    | “nasal mucus”      | 鼻涕 |
|      |      | zuei li                | “sharp”            | 銳利 |
| u    | 1    | ʂou tu                 | “capital”          | 首都 |
|      |      | tʂ <sup>h</sup> u tsu  | “to rent”          | 出租 |
|      |      | taŋ tʂ <sup>h</sup> u  | “at that time”     | 當初 |
|      | 2    | xən tu                 | “crude”            | 狠毒 |
|      |      | lu t <sup>h</sup> u    | “journey”          | 路途 |
|      |      | wei lu                 | “to dine together” | 圍爐 |
|      | 3    | t <sup>h</sup> i en pu | “to fill”          | 填補 |
|      |      | ni t <sup>h</sup> u    | “mud”              | 泥土 |
|      |      | ɕia ʂu                 | “subordinate”      | 下屬 |
|      | 4    | tʂəŋ tu                | “degree”           | 程度 |
|      |      | ou t <sup>h</sup> u    | “to vomit”         | 嘔吐 |
|      |      | ma lu                  | “road”             | 馬路 |
| y    | 1    | ku tɕy                 | “former home”      | 故居 |
|      |      | wei tɕ <sup>h</sup> y  | “feel wronged”     | 委屈 |
|      |      | pi ɕy                  | “necessary”        | 必需 |
|      | 2    | jou tɕy                | “post office”      | 郵局 |
|      |      | ʂəŋ ɥy                 | “what’s left”      | 剩餘 |
|      |      | jou ɥy                 | “because”          | 由於 |
|      | 3    | kuei tɕy               | “rules”            | 規矩 |
|      |      | kɤ tɕ <sup>h</sup> y   | “songs”            | 歌曲 |
|      |      | je ɕy                  | “maybe”            | 也許 |
|      | 4    | wan tɕy                | “polite refusal”   | 婉拒 |
|      |      | jou tɕ <sup>h</sup> y  | “interesting”      | 有趣 |
|      |      | fa ly                  | “law”              | 法律 |

|   |   |                                      |                      |    |
|---|---|--------------------------------------|----------------------|----|
| a | 1 | xuən ta                              | “mixed style”        | 混搭 |
|   |   | tʃi fa                               | “to stimulate”       | 激發 |
|   |   | muo ts <sup>h</sup> a                | “fiction”            | 摩擦 |
|   | 2 | tʃ <sup>h</sup> u fa                 | “punishment”         | 處罰 |
|   |   | xuo ta                               | “optimistic”         | 豁達 |
|   |   | ts <sup>h</sup> au tsa               | “noisy”              | 吵雜 |
|   | 3 | wo pa                                | “handle”             | 握把 |
|   |   | pan ma                               | “zebra”              | 斑馬 |
|   |   | t <sup>h</sup> ou fa                 | “hair”               | 頭髮 |
|   | 4 | tʃien t <sup>h</sup> a               | “to trample”         | 踐踏 |
|   |   | tsuo pa                              | “to give up”         | 作罷 |
|   |   | xuoŋ tʃa                             | “to bomb”            | 轟炸 |
| o | 1 | fən tuo                              | “numerous”           | 繁多 |
|   |   | t <sup>h</sup> uei t <sup>h</sup> uo | “outgoing”           | 活潑 |
|   |   | p <sup>h</sup> a p <sup>h</sup> uo   | “to move up a slope” | 爬坡 |
|   | 2 | p <sup>h</sup> oŋ puo                | “prosperous”         | 蓬勃 |
|   |   | ts <sup>h</sup> aŋ tuo               | “to rob”             | 搶奪 |
|   |   | yi tʃuo                              | “clothes”            | 衣著 |
|   | 3 | p <sup>h</sup> ien p <sup>h</sup> uo | “biased”             | 偏頗 |
|   |   | ʃan tuo                              | “to dodge”           | 閃躲 |
|   |   | tsɿ suo                              | “bathroom”           | 廁所 |
|   | 4 | lan tuo                              | “lazy”               | 懶惰 |
|   |   | pou p <sup>h</sup> uo                | “to explode”         | 爆破 |
|   |   | kuo tuso                             | “mistake”            | 過錯 |
| ɿ | 1 | k <sup>h</sup> uai tʃ <sup>h</sup> ɿ | “express”            | 快車 |
|   |   | tʃ <sup>h</sup> aŋ kɿ                | “to sing”            | 唱歌 |
|   |   | tiau k <sup>h</sup> ɿ                | “sculpture”          | 雕刻 |
|   | 2 | ʃɿ tɿ                                | “willing to do sth.” | 捨得 |
|   |   | ta tʃɿ                               | “to discount”        | 打折 |
|   |   | maŋ ʃɿ                               | “python”             | 蟒蛇 |
|   | 3 | ʃʌ tʃɿ                               | “wise person”        | 智者 |
|   |   | la tʃ <sup>h</sup> ɿ                 | “to pull”            | 拉扯 |
|   |   | ʃʌ ʃɿ                                | “to give away”       | 施捨 |
|   | 4 | kɿ ʌɿ                                | “heat protection”    | 隔熱 |
|   |   | jiŋ ʃɿ                               | “to allude to”       | 影射 |
|   |   | jen sɿ                               | “color”              | 顏色 |

|    |    |                                       |                       |                 |    |
|----|----|---------------------------------------|-----------------------|-----------------|----|
| e  | 1  | çien tɕie                             | “to connect”          | 銜接              |    |
|    |    | nien t <sup>h</sup> ie                | “to paste”            | 黏貼              |    |
|    |    | ts <sup>h</sup> ai tɕ <sup>h</sup> ie | “to cut”              | 裁切              |    |
|    | 2  | li pie                                | “to part”             | 離別              |    |
|    |    | fan tɕ <sup>h</sup> ie                | “tomato”              | 蕃茄              |    |
|    |    | tɕ <sup>h</sup> iŋ çie                | “to tilt”             | 傾斜              |    |
|    | 3  | xɣ tɕie                               | “to compromise”       | 和解              |    |
|    |    | piŋ tɕ <sup>h</sup> ie                | “and”                 | 並且              |    |
|    |    | ʂu çie                                | “to write”            | 書寫              |    |
|    | 4  | kan çie                               | “to thank”            | 感謝              |    |
|    |    | tɕ <sup>h</sup> iəŋ lie               | “strong”              | 強烈              |    |
|    |    | ʂɹ tɕie                               | “world”               | 世界              |    |
| ai | 1  | tɕ <sup>h</sup> iou p <sup>h</sup> ai | “bat (for sports)”    | 球拍              |    |
|    |    | tʂ <sup>h</sup> ɹ tai                 | “dementia”            | 痴呆              |    |
|    |    | tɕ <sup>h</sup> iŋ t <sup>h</sup> ai  | “moss”                | 青苔              |    |
|    | 2  | p <sup>h</sup> iŋ t <sup>h</sup> ai   | “platform”            | 平台              |    |
|    |    | tʂu tʂai                              | “house”               | 住宅              |    |
|    |    | xuei lai                              | “to come back”        | 回來              |    |
|    | 3  | çia tʂai                              | “narrow”              | 狹窄              |    |
|    |    | tçiŋ ts <sup>h</sup> ai               | “brilliant”           | 精彩              |    |
|    |    | koŋ tsai                              | “action figure”       | 公仔              |    |
|    | 4  | çi tai                                | “to carry”            | 攜帶              |    |
|    |    | t <sup>h</sup> au t <sup>h</sup> ai   | “to screen out”       | 淘汰              |    |
|    |    | ji lai                                | “to rely on”          | 依賴              |    |
|    | ei | 1                                     | kan pei               | “bottom up”     | 乾杯 |
|    |    |                                       | tɕ <sup>h</sup> i fei | “to take off”   | 起飛 |
|    |    |                                       | la p <sup>h</sup> ei  | “molding clay”  | 拉胚 |
| 2  |    | ta lei                                | “to thunder”          | 打雷              |    |
|    |    | tsuo p <sup>h</sup> ei                | “to accompany”        | 作陪              |    |
|    |    | tau tsei                              | “thief”               | 盜賊              |    |
| 3  |    | pau lei                               | “fortress”            | 堡壘              |    |
|    |    | nan pei                               | “south and north”     | 南北              |    |
|    |    | t <sup>h</sup> u fei                  | “bandit”              | 土匪              |    |
| 4  |    | lau lei                               | “tired”               | 勞累              |    |
|    |    | tʂuən pei                             | “preparation”         | 準備              |    |
|    |    |                                       | fən p <sup>h</sup> ei | “to distribute” | 分配 |

|    |   |                                       |                           |    |
|----|---|---------------------------------------|---------------------------|----|
| au | 1 | lau tau                               | “to nag”                  | 嘮叨 |
|    |   | p <sup>h</sup> uo t <sup>h</sup> au   | “ocean waves”             | 波濤 |
|    |   | ta lau                                | “to get out of the water” | 打撈 |
|    | 2 | p <sup>h</sup> an t <sup>h</sup> au   | “to defect”               | 叛逃 |
|    |   | çin lau                               | “toil”                    | 辛勞 |
|    |   | laŋ tɕ <sup>h</sup> au                | “ocean waves”             | 浪潮 |
|    | 3 | tɕ <sup>h</sup> iŋ tau                | “to dump”                 | 傾倒 |
|    |   | tɕi t <sup>h</sup> au                 | “to beg”                  | 乞討 |
|    |   | ku lau                                | “ancient”                 | 古老 |
|    | 4 | tɕ <sup>h</sup> ɣ tau                 | “traffic lane”            | 車道 |
|    |   | tɕie t <sup>h</sup> au                | “to solve problems”       | 解套 |
|    |   | fən tsau                              | “restless”                | 煩燥 |
| ou | 1 | çiau t <sup>h</sup> ou                | “thief”                   | 小偷 |
|    |   | tɕən sou                              | “to search”               | 偵搜 |
|    |   | xuei ɕou                              | “to recycle”              | 回收 |
|    | 2 | k <sup>h</sup> oŋ t <sup>h</sup> ou   | “to air-drop”             | 空投 |
|    |   | kau lou                               | “high building”           | 高樓 |
|    |   | tɕ <sup>h</sup> əŋ ɕou                | “mature”                  | 成熟 |
|    | 3 | fə tou                                | “to shiver”               | 發抖 |
|    |   | tɕu lou                               | “bamboo basket”           | 竹篾 |
|    |   | tɕiŋ tsou                             | “walking race”            | 競走 |
|    | 4 | ta tou                                | “to fight”                | 打鬥 |
|    |   | tɕ <sup>h</sup> uan t <sup>h</sup> ou | “to penetrate”            | 穿透 |
|    |   | fəŋ lou                               | “leak-proof”              | 防漏 |
| an | 1 | tɕəŋ tan                              | “to be responsible”       | 承擔 |
|    |   | fən t <sup>h</sup> an                 | “to share loads”          | 分攤 |
|    |   | wu tsan                               | “lunch”                   | 午餐 |
|    | 2 | mien t <sup>h</sup> an                | “interview”               | 面談 |
|    |   | tɕ <sup>h</sup> ai lan                | “basket”                  | 菜籃 |
|    |   | tien zən                              | “to ignite”               | 點燃 |
|    | 3 | ta tan                                | “brave”                   | 大膽 |
|    |   | mau t <sup>h</sup> an                 | “woollen blanket”         | 毛毯 |
|    |   | tien lan                              | “cable”                   | 電纜 |
|    | 4 | xua tan                               | “young female role”       | 花旦 |
|    |   | kan t <sup>h</sup> an                 | “to sigh”                 | 感嘆 |
|    |   | tɕ <sup>h</sup> an lan                | “splendid”                | 燦爛 |

|    |   |                         |                      |    |
|----|---|-------------------------|----------------------|----|
| en | 1 | k <sup>h</sup> oŋ tɕien | “space”              | 空間 |
|    |   | p <sup>h</sup> aŋ pien  | “nearby”             | 旁邊 |
|    |   | ɕin ɕien                | “fresh”              | 新鮮 |
|    | 2 | jou ɕien                | “leisurely”          | 悠閒 |
|    |   | ɕin nien                | “new year”           | 新年 |
|    |   | ʂəŋ tɕ <sup>h</sup> ien | “money-saving”       | 省錢 |
|    | 3 | tɕie tɕien              | “economical”         | 節儉 |
|    |   | tʂoŋ tien               | “key point”          | 重點 |
|    |   | tɕiŋ ɕien               | “dangerous”          | 驚險 |
|    | 4 | fa ɕien                 | “to discover”        | 發現 |
|    |   | faŋ pien                | “convenient”         | 方便 |
|    |   | lai tien                | “incoming call”      | 來電 |
| aŋ | 1 | tan taŋ                 | “responsibility”     | 擔當 |
|    |   | noŋ t <sup>h</sup> aŋ   | “thick soup”         | 濃湯 |
|    |   | fən faŋ                 | “aromatic”           | 芬芳 |
|    | 2 | kɤ t <sup>h</sup> aŋ    | “class”              | 課堂 |
|    |   | tʂaŋ laŋ                | “cockroach”          | 蟑螂 |
|    |   | t <sup>h</sup> i faŋ    | “river bank”         | 堤防 |
|    | 3 | tsu taŋ                 | “to block”           | 阻擋 |
|    |   | p <sup>h</sup> iŋ taŋ   | “to lie down”        | 平躺 |
|    |   | muo faŋ                 | “to imitate”         | 模仿 |
|    | 4 | pai taŋ                 | “to swing”           | 擺盪 |
|    |   | fa t <sup>h</sup> aŋ    | “burning hot”        | 發燙 |
|    |   | tɕie faŋ                | “to release”         | 解放 |
| oŋ | 1 | ɕiaŋ t <sup>h</sup> oŋ  | “to figure out”      | 想通 |
|    |   | xan toŋ                 | “cold winter”        | 寒冬 |
|    |   | ʂɹ tʂoŋ                 | “clock”              | 時鐘 |
|    | 2 | ɕiaŋ t <sup>h</sup> oŋ  | “identical”          | 相同 |
|    |   | tɕi loŋ                 | “place name”         | 基隆 |
|    |   | fu ts <sup>h</sup> oŋ   | “to abide by”        | 服從 |
|    | 3 | ma toŋ                  | “toilet”             | 馬桶 |
|    |   | pien tʂoŋ               | “mutant”             | 變種 |
|    |   | tʂou tʂ <sup>h</sup> oŋ | “to receive a favor” | 受寵 |
|    | 4 | ʂən toŋ                 | “to shake”           | 震動 |
|    |   | piŋ t <sup>h</sup> oŋ   | “sickness”           | 病痛 |
|    |   | t <sup>h</sup> i tʂoŋ   | “body weight”        | 體重 |

## Appendix 2

The results of the factor interactions tested by factorial ANOVA are presented in the table below.

|                  |                | p value |
|------------------|----------------|---------|
| gender*tone*rime | declaratives   | 0.920   |
|                  | interrogatives | 0.309   |
| gender*rime      | declaratives   | 1.000   |
|                  | interrogatives | 0.721   |
| gender*tone      | declaratives   | 0.438   |
|                  | interrogatives | 0.521   |
| rime*tone        | declaratives   | 0.295   |
|                  | interrogatives | 0.298   |
| speaker*rime     | declaratives   | 1.000   |
|                  | interrogatives | 0.527   |
| speaker*tone     | declaratives   | 1.000   |
|                  | interrogatives | 0.730   |

# Developmental Patterns in the Reduction of Unstressed Vowels by German Learners of English

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**Abstract:** This study investigates vowel reduction in unstressed syllables in German Learner English, comparing learners at three different proficiency levels with native speakers of Standard Southern British English. Two acoustic properties of unstressed vowels were measured: duration and formant structure. Based on Major's (2001) Ontogeny Phylogeny Model of second language acquisition, a U-shaped developmental pattern was predicted. The results follow the predicted pattern and seem to support the chronological corollary of Major's model: initial transfer of L1 stress-timing properties appears to facilitate vowel reduction. The subsequent influence of universal structures surfaces in an overarticulation of unstressed vowels. The final increase of target language structures leads to a higher degree of vowel reduction.

**Keywords:** vowel reduction; acoustic study; SLA; L1 German; L2 English.

## 1. Introduction

In English, vowels occurring in unstressed syllables are reduced—they are articulated with a more central position of the tongue, a narrower jaw-opening and a loss of lip rounding (Delattre 1981). Acoustically, this is reflected in their duration and formant structure. A lack of vowel reduction in unstressed syllables has been described as a characteristic feature of German Learner English (GLE) in auditory accounts of this learner variety (e.g., Pascoe 1996; Parkes 2001; Dretzke 2006). The acoustic properties of reduction phenomena and speech rhythm in GLE have been investigated in a number of instrumental studies, which differ in scope and methodology (Gut 2009; Ordin et al. 2011; Li 2014; Sönning 2014). This study aims to shed light on developmental

patterns in the acquisition of vowel reduction by German learners, and is carried out in the framework of the Ontogeny Phylogeny Model (OPM) of second language acquisition proposed by Major (2001). The model decomposes interlanguage into three types of structures and describes their systematic interplay over the course of second language acquisition. It thus provides a solid foundation for studying interlanguage development.

An outline of the OPM will show that predictions about developmental patterns need to take into account a contrastive analysis of English and German as well as universal mechanisms that may surface in learner speech. A discussion of both factors in the light of previous research findings will show that the nature of their influence and interplay in the acquisition of vowel reduction remains unclear. Past studies have drawn different conclusions regarding the influence of L1 transfer and universals in this area of L2 prosody. This study aims to demonstrate that the OPM may be able to account for the contradictory evidence reported in the literature. The model assumes that both factors play a role in the acquisition of L2 structures, but the degree of influence varies during interlanguage development. Based on the assumptions of the OPM, vowel reduction in GLE was predicted to follow a U-shaped developmental pattern. The results seem to support the hypothesized pattern, suggesting that conclusions concerning the influence of transfer vs. universals may depend on the developmental stage of the learners in the sample.

## **2. Background**

### **2.1 Vowel Reduction and Speech Rhythm**

The reduction of unstressed vowels in connected speech is closely related to the rhythmical properties of a language or accent. A long-standing claim is that languages can be grouped into two rhythmic classes: syllable-timed and stress-timed (Pike 1945; Abercrombie 1967). This rhythm-class hypothesis still awaits empirical verification (e.g., Roach 1982), and the binary opposition has given way to the view that languages vary along a continuum. The notion of isochrony has been questioned by Dauer (1983), who claims that rhythmic differences between languages reflect a number of phonological properties, such as syllable structure, length as a distinctive feature in vowels, and the (non-)existence of vowel reduction.

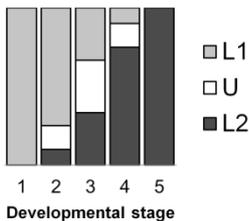
Vowel reduction is a characteristic feature of stress-timed languages like English and German (Kohler 1995; Giegerich 1992). Recent attempts to quantify the rhythmic properties of languages have relied on durational measurements to capture timing patterns in speech. These rhythm metrics have been used to measure the durational variability of vocalic intervals, either globally ( $\Delta V$ , Ramus et al. 1999; VarcoV, Dellwo and Wagner 2003), or locally, i.e., by taking into consideration the linear arrangement of events (PVI-V, Low and Grabe 1995). Generally, local rhythm

metrics calculate a single value per speaker or speaker group by averaging durational ratios or differences of successive intervals. While the usefulness of these metrics as a measure of speech rhythm has been questioned (e.g., Kohler 2009; Arvaniti 2012), their condensed quantification of the vocalic variability in connected speech makes them a useful tool for measuring durational vowel reduction.

## 2.2 Major's (2001) Ontogeny Phylogeny Model

Major's (2001) Ontogeny Phylogeny Model (OPM) of second language acquisition rests on two basic assumptions, namely that (i) a learner's interlanguage consists of three types of structural components—L1, L2, and U—and (ii) the relationship between these components changes systematically over time. According to the OPM, the structures found in learner speech are attributable to L1, i.e., transfer from the native language, L2, i.e., target language structures, or U, universal structures not part of L1 or L2. Major's definition of universals is broad, including "the universal set of properties of the human language capacity and the resulting universal characteristics of languages. In addition to abstract linguistic constructs, U includes anatomical, functional and processing properties of the human mind" (2001, 83). The OPM thus postulates that any interlanguage feature can be attributed to either L1, L2, or U.

The model further states that the relationship between these components changes systematically during interlanguage development. The basic chronological assumption is that over the course of five hypothetical developmental stages, the presence of transferred L1 structures decreases, while the presence of target language structures increases. The influence, or presence, of universal language properties first increases and then decreases. The assumptions of Major's model are summarized in Figure 1.



**Figure 1.** The assumptions of Major's (2001) OPM.

Predictions about interlanguage development based on the OPM therefore need to take into account similarities and differences between English and German as well as universal structures that may surface in the acquisition of vowel reduction.

### 2.3 Vowel Reduction: English vs. German

German and English are both considered stress-timed languages (Kohler 1995; Giegerich 1992); they share a number of typical properties. Apart from having a complex syllable structure, both languages (i) distinguish stressed and unstressed syllables in terms of quality and quantity; (ii) have the short central vowel [ə] (or schwa) and (iii) show schwa deletion and syllabic consonants as extreme forms of reduction. These features allow the compression of syllable nuclei to (theoretically) achieve isochrony between stressed syllables.

However, the distribution of schwa vowels in German is more restricted (Kaltenbacher 1998). In simple lexemes, they are only found in stem-final syllables (*Hase*, ['ha:zə]) or inflectional affixes (*ge-dacht*, [gə'daxt]; *denk-e*, ['dɛŋkə]). In English, there are no morphological restrictions. In contrast to English, German has a second, more open schwa vowel [ɐ], which occurs in contrast with [ə] (*bitte* ['bitə], *bitter* ['bitɐ]). The distribution of schwa also differs in complex lexemes. In both languages, morphophonological processes apply to derived words such as *photography* and *Fotografie*, which differ from their base in terms of primary and/or secondary stress placement. In German, vowel reduction in such cases can be observed as a shortening of long vowels (*Foto* ['fo:to]—*Fotograf* [foto'gra:f]—*Fotografie* [foto'gra:fi:]). A change of vowel quality from tense to lax is less frequent, and vowels are never reduced to schwa. Through productive morphophonological processes in English, on the other hand, unstressed vowels are shortened and centralized to (wards) schwa (*photo* ['fəʊtəʊ]—*photograph* ['fəʊtəgrɑ:f]—*photography* [fə'tɒgrəfi]). In general, the quality of unstressed vowels in polysyllabic words shows a higher degree of reduction in English.

In connected speech, closed-class function words (e.g., determiners, pronouns, conjunctions, auxiliaries) can undergo reduction in both languages (*und* [ʊnt]→[ənt]→[ən]→[n]; *and* [ænd]→[ənd]→[ən]→[n]). In German, however, these reduction processes are stylistically marked; they only occur in informal speaking styles (Kohler 1995; Wesener 1999). In clear speech, syllable nuclei in monosyllabic function words are not reduced to [ə]. In English, the weak form of function words (which involves [ə] in many cases) is the unmarked variant, even in formal speech. Thus, while both languages show reduction in function words, a centralization of vowel quality is much more common in English, which is primarily due to stylistic differences.

In summary, both languages show vowel reduction. While the reduction of vowel duration is similar in both languages, the reduction of vowel quality is greater in English.

### 2.4 Vowel Reduction: Universals

Past research on the presence/absence of reduction phenomena in learner speech has shown this to be an area of difficulty in L2 acquisition (e.g., Flege and Bohn 1989; Gut 2006; Aoyama and Guion 2007). A general feature of non-native speech seems to be

a tendency to overarticulate compared to native speakers (Barry 2007). The tendency towards overarticulation and thus a lack of reduction in unstressed syllables may be considered a universal structure in interlanguage phonology; several arguments support this claim. One fundamental assumption of second language acquisition research is that interlanguages behave according to the same rules as natural languages. This was stated in Eckman's (1991) Structural Conformity Hypothesis, which postulates that "the universal generalizations that hold for the primary languages also hold for interlanguages" (Eckman 1991, 24). Research into the L1 acquisition of stress-timed languages has shown that children seem to develop from syllable-timed to stress-timed speech (Allen and Hawkins 1980; Grabe et al. 1999). This generalization may also hold for the L2 acquisition of stress-timed languages, with learners showing a similar developmental path. Parallels in rhythm development between L1 and L2 speech have been suggested by Ordin and Polyanskaya (2014), who found similar developmental paths in the acquisition of English as an L1 and as an L2 by adult Italian and Punjabi learners. However, Punjabi and Italian are considered to be syllable-timed. The rhythmic development found by Ordin and Polyanskaya may thus be explained by the presence of L1 and L2 components in their interlanguage, not necessarily universal structures.

Li (2014) analyzed the timing patterns produced by German and Chinese learners of English at different proficiency levels and native speakers of American English. Despite their typologically different L1s, both learner groups showed similar developmental patterns—the degree of vowel reduction was higher in the advanced learners. Li (2014) interprets these findings as evidence for a general mechanism in second language acquisition, i.e., a tendency towards overarticulation. This may also be reflected in a study by White and Mattys (2007), who compared Dutch native speakers with English learners of Dutch and vice versa. While both L1s are considered stress-timed, the two learner groups showed a lower degree of stress-timing than the native speakers. It appears that these findings cannot be explained in terms of L1 or L2 structures.

In summary, empirical evidence seems to support the claim that a tendency towards syllable-timing and thus an overarticulation of unstressed vowels may be considered a universal property of interlanguage that surfaces in the course of L2 acquisition.

## 2.5 Past Research on Vowel Reduction in German Learner English

Acoustic studies on vowel reduction in GLE have investigated the differences between learners and native speakers as well as learners at different proficiency levels. Comparing advanced German learners with native speakers of British English, Gut (2009) analyzed durational differences of successive stressed/unstressed syllable pairs in a reading passage. The native speakers' syllable ratio (2.50:1) was larger than that of the learners

(2.23:1), indicating that the group of learners did not reach the native speaker level of vowel reduction. A study by Sönning (2014) compared unstressed vowels in advanced learners and native speakers of SSBE. While there was no statistical difference in duration, learners produced unstressed vowels with a slightly higher  $F_1$  and a considerably lower  $F_2$ , the difference in  $F_2$  being statistically significant for each learner. These results suggest that advanced learners can reach a native-like level of durational vowel reduction; the overarticulation of vowel quality might reflect transfer from L1 and/or a universal tendency.

Studies comparing German learners at different proficiency levels found a developmental increase of vowel reduction. Ordin et al. (2011) analyzed the development of speech rhythm in German learners using various rhythm metrics. They compared three groups of learners: lower-intermediate, upper-intermediate and advanced. Variability of vowel durations increased with language proficiency, indicating that more advanced learners show higher durational reduction of unstressed vowels. The study did not include a native speaker control group. Li (2014) investigated the reduction of vowel quality and duration by three speaker groups: lower-intermediate and advanced German learners, and native speakers of American English. The study measured vowel duration and quality ( $F_1$  and  $F_2$ ); vowel reduction was quantified by calculating the ratio of the respective measurements of unstressed to stressed vowels. The advanced learners did not differ from the native speakers in the reduction of vowel quality and duration. The lower-intermediate learners showed a significantly lower reduction of vowel quality and duration. These findings suggest that the degree of vowel reduction in GLE increases during interlanguage development with advanced learners reaching the level of native speakers.

## 2.6 Vowel Reduction in GLE: Transfer vs. Universals

It remains unclear to which degree the prosodic similarity between English and German facilitates the acquisition of vowel reduction. Transfer from L1 plays an important role in L2 phonology (e.g., Major 2008) and has been observed for suprasegmental phenomena. A study by Gut (2003) found rhythmic interference in unstressed syllables resulting from transfer of L1 properties in the speech of Polish, Chinese and Italian learners of German. In a review of past research on L2 stress patterns, Broselow and Kang (2013) conclude that prosodic similarity between L1 and L2 facilitates acquisition; errors tend to reflect L1 influence. Li (2014) did not find evidence for L1 transfer in lower-intermediate and advanced German learners of English. Based on her results she suggests that L1 does not play a role in the L2 acquisition of vowel reduction.

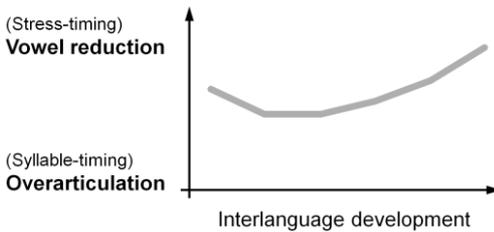
Past research has thus produced conflicting evidence and explanations regarding the underlying mechanisms in the acquisition of vowel reduction. However, these findings appear to be consistent with the assumptions of Major's (2001) OPM. The

model postulates that transfer from L1 plays an important role in the initial stages of L2 acquisition. A possible explanation of the findings reported by Li (2014) is that the lower-intermediate learners in her study have developed beyond the stage where the reduction of unstressed vowels is influenced by L1 transfer.

### 3. Aims and Method

#### 3.1 Aims of the Study

This study aims to shed new light on the development of vowel reduction in GLE by comparing native speakers of SSBE with learners at three different stages: advanced, intermediate, and beginners. Based on the OPM, a U-shaped development of vowel reduction is predicted: Initial transfer of L1 stress-timing properties facilitates vowel reduction. The subsequent influence of universal structures surfaces in an over-articulation of unstressed vowels. The final increase of target language structures leads to a higher degree of vowel reduction. The expected pattern is shown in Figure 2.



**Figure 2.** The predicted U-shaped developmental pattern.

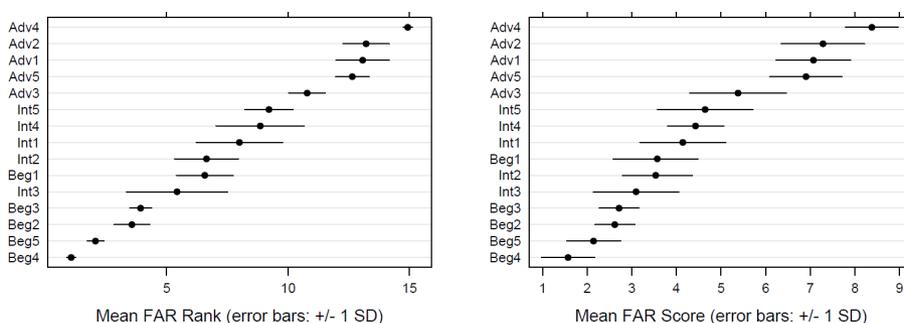
#### 3.2 Method and Data

The recordings of 20 participants were analyzed. While students learning English at school were sampled for the beginner and intermediate groups, university students majoring in English formed the group of advanced learners. Table 1 describes the four groups in more detail, including age, grade, and the age of learning. All learners grew up and live in southern Germany and learned English in an institutional setting.

| Group           | N | Age   | Grade      | Age of learning    |
|-----------------|---|-------|------------|--------------------|
| Beginner        | 5 | 11–13 | 6–8        | 8, 8, 9, 10, 11    |
| Intermediate    | 5 | 16    | 9–11       | 8, 8, 9, 10, 10    |
| Advanced        | 5 | 19–29 | University | 10, 10, 11, 11, 12 |
| Native speakers | 5 | 21–34 |            |                    |

**Table 1.** Description of the sample.

The younger participants were assigned to the beginner or intermediate group based on their age and what grade they were in. The two groups are comparable in terms of the age of their first English lessons (cf. Table 1). A foreign accent rating (FAR) was obtained for each learner based on a total of 20–30 seconds of read connected speech. Seven members of staff at the department of English linguistics, all native speakers of German, rated each learner on a scale from 1–9 (Southwood and Flege 1999). For each learner, the raw scores as well as the ranks obtained across the 7 raters were averaged. Figure 3 shows the mean FAR scores and ranks. The results validate the grouping. The only exception is subject Beg1, who was rated higher than the other learners in the beginner group.



**Figure 3.** Results of the foreign accent rating of the learners. The left panel shows the mean rank (15 being the highest), the right panel the mean raw score (scale 1–9). Error bars indicate  $\pm 1$  standard deviation.

A reading task was used to elicit 5 sentences, which were embedded in a mini-dialogue in order to produce consistent stress patterns. Prior to the recordings, participants were given time to familiarize themselves with the sentences. All speakers were asked to read in a way they felt comfortable with.

The acoustic analysis was carried out in Praat (Boersma and Weenink 2014). The data was segmented manually following the principles outlined in Machač and Skarnitzl (2009). Deleted vowels were included in the analysis (duration = 0). The vowel target was determined visually at the point of maximal displacement (Di Paolo et al. 2011). The  $F_1$  and  $F_2$  measurements were transformed to  $\omega$ Bark (octaves relative to 1 Bark) for analysis (Schützler 2011) and then normalized with the method proposed by Lobanov (1971).

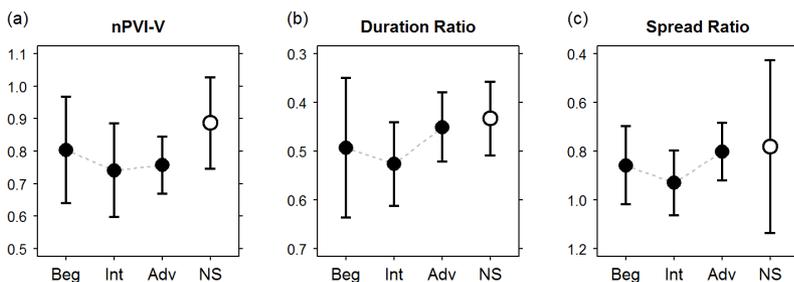
The methods for measuring vowel reduction are consistent with those used by Li (2014) and Ordin et al. (2011) in order to make results comparable with previous research findings. Durational vowel reduction was measured with two methods, the normalized Pairwise Variability Index for vocalic intervals (nPVI-V, Grabe and Low

2002; applied by Ordin et al. 2011) and a Duration Ratio of unstressed to stressed vowels (applied by Li 2014). All vocalic intervals were included in the calculation of the nPVI-V. For the calculation of the Duration Ratio, vowels were categorized as stressed or unstressed. Sentence-final vowels were excluded and 5% trimming was used to avoid the influence of outliers. A Duration Ratio of 0.8, for example, would indicate that, on average, the duration of unstressed vowels was 0.8 times the duration of stressed vowels, i.e., a difference of 20%. Reduction of vowel quality was measured with the Spread Ratio of unstressed to stressed vowels, which aims to quantify the dispersion of vowel tokens in the  $F_1 \times F_2$  space (applied by Li 2014). Spread was measured separately for stressed and unstressed vowels as the average Euclidean distance to the respective centroid. Sentence-final vowels were excluded and 5% trimming was used to avoid the influence of outliers.

The measurement of the nPVI-V, the Duration Ratio and the Spread Ratio yielded a mean for each speaker. Group means and confidence intervals are calculated from the speaker means, thus based on 5 observations.

## 4. Results

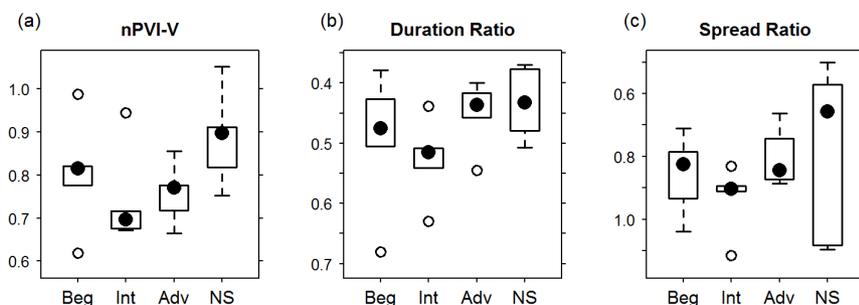
Figure 4 shows the group means of the three variables. The scales of the y-axis are arranged to show degree of reduction (i.e., the scales in [4b] and [4c] are inverted). A consistent pattern emerges across all three plots: on average, (i) native speakers (white dots) score higher than all learner groups; (ii) beginners score higher than intermediate learners across all measures; (iii) advanced learners score higher than intermediate learners across all measures.



**Figure 4.** Group means for the reduction of vowel duration ([a] and [b]) and quality (c); error bars show 95% confidence intervals.

The boxplots in Figure 5 give more detailed information about the dispersion of scores within groups. The pattern observed in Figure 4 holds for the group medians (black dots). The advanced learners were most similar to the native speakers in the Duration Ratio. The two measurements used to determine durational vowel reduction, the nPVI-V and the Duration Ratio, produced consistent results for all groups with the exception of the

advanced learners. Relative to the other groups, their nPVI-V score is lower than the Duration Ratio. Figure 5 shows that the high variability in the Spread Ratio of native speaker group is due to the fact that two native speakers overarticulated in terms of vowel quality. The group medians show that the three learner groups are more similar to native speakers in the Duration Ratio than the Spread Ratio. The results are summarized in Table 2.



**Figure 5.** Boxplots for the reduction of vowel duration ([a] and [b]) and quality (c); the black dots represent the group medians.

| Group           | nPVI-V |              | Duration Ratio |              | Spread Ratio |              |
|-----------------|--------|--------------|----------------|--------------|--------------|--------------|
|                 | Mean   | 95% CI       | Mean           | 95% CI       | Mean         | 95% CI       |
| Beginner        | 0.80   | [0.64; 0.98] | 0.49           | [0.35; 0.64] | 0.86         | [0.70; 1.02] |
| Intermediate    | 0.74   | [0.60; 0.88] | 0.53           | [0.44; 0.61] | 0.93         | [0.80; 1.06] |
| Advanced        | 0.76   | [0.67; 0.84] | 0.45           | [0.38; 0.52] | 0.80         | [0.68; 0.92] |
| Native speakers | 0.89   | [0.75; 1.03] | 0.43           | [0.36; 0.51] | 0.78         | [0.43; 1.14] |

**Table 2.** Results of the nPVI-V, Duration Ratio and Spread Ratio measurements.

## 5. Discussion

The objective of this study was to shed light on developmental patterns in the acquisition of vowel reduction by German learners of English. Past research has produced conflicting interpretations with regard to the factors shaping the acquisition of speech rhythm and vowel reduction. A growing body of empirical evidence seems to support the assumption that a tendency towards overarticulation is a universal feature in learner speech. In the case of GLE, it remains unclear to which degree transfer from L1 plays a role. It was shown that contradicting explanations can be resolved within the framework of Major's (2001) OPM, which postulates that transfer from L1 and universals surface at different stages in interlanguage development.

Based on the OPM, a U-shaped developmental pattern of vowel reduction in GLE was predicted. The results seem to support this pattern. Beginners appear to show a higher degree of reduction in the duration and quality of unstressed vowels compared with intermediate learners. The latter group can be characterized as showing the highest degree of overarticulation in terms of vowel quality and quantity. As predicted by the OPM, the universal tendency decreases as learners become more advanced, and an increase in L2 structures leads to more native-like speech.

The results are consistent with those reported by previous studies on speech rhythm and vowel reduction in GLE. The increase of the vocalic variability from intermediate to advanced learners (measured with the nPVI-V) is compatible with the findings reported by Ordin et al. (2011). However, the differences are less pronounced in this study. The developmental contrasts between intermediate and advanced learners in terms of the Duration Ratio and the Spread Ratio are consistent with Li's (2014) results. Figure 5 showed that the advanced learners reached a native-speaker-like level in the Duration Ratio, but not in the Spread Ratio. This is in agreement with the findings reported by Sönning (2014). The fact that all learner groups are closer to the native speakers in the Duration Ratio than in the Spread Ratio might reflect the facilitating effect of L1 transfer. The contrastive analysis showed that while the reduction of vowel duration is similar in both languages, the reduction of vowel quality is greater in English.

However, these findings must be interpreted with caution. The widths of the confidence intervals in Figure 4 show that the mean group values lack precision; it is not clear whether these findings can be replicated. This is due to the small sample sizes—each group mean is based on only 5 observations. A methodological issue is the operationalization of vowel reduction. This study used three types of measures applied in previous studies investigating reduction phenomena and rhythm in learner speech. The discrepancy of the nPVI-V and the Duration Ratio in the group of advanced learners raises questions about the validity of these two measures as a quantification of vowel reduction. A reanalysis of the data showed that these patterns hold when (i) excluding sentence-final vowels from the nPVI-V measurements and (ii) using no trimming for the calculation of the Duration Ratio. The discrepancy is therefore not attributable to these methodological decisions. Further, a low ratio of unstressed and stressed vowel duration or spread has been assumed to signal a high degree of vowel reduction. However, this measure is also influenced by the lengthening of stressed vowels and might not be a valid indicator of vowel reduction. Thus, while the rhythm scores applied in this study yield a conveniently condensed quantification of reduction phenomena in connected speech, they only provide a very global measurement. These methodological limitations need to be taken into account in future research.

Nevertheless, the results show a tendency towards the hypothesized pattern. The OPM may thus be able to account for the contradictory evidence reported in previous studies regarding the influence of transfer and universals in the acquisition of vowel reduction.

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# Syllable-Driven Conspiracy Effects in European Portuguese

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**Abstract:** The aim of this paper is to present an account of European Portuguese syllable structure from two perspectives: rule-based and constraint-based. It is argued that an analysis couched in Optimality Theory is superior to the derivational alternative as it provides a formal means to capture the unity behind three disparate processes which conspire to repair illicit syllables.

**Keywords:** Optimality Theory; Portuguese; syllable; empty nucleus.

## 1. Introduction

In this paper, we aim to show the superiority of a constraint-based framework over the standard rule-based theory in the way it accounts for selected data from European Portuguese. In Section 2, we present the basic generalizations about the syllable structure of European Portuguese, including the limitations on syllable constituents and a number of exceptions to these requirements. Section 3 provides an analysis of the exceptional forms in the rule-based framework and lists problematic or controversial aspects of this approach. The constraint-based analysis is presented in Section 4. The final section contains a brief comparison and a summary of the conclusions.

## 2. Portuguese Syllable

In this section, we lay out the facts about the Portuguese syllable, as well as a number of restrictions on its structure summarized in Mateus and d'Andrade (2002).

## 2.1 Onset

Portuguese, like other Romance languages, has rigid restrictions on syllable constituents. It does not allow onsets consisting of more than two consonants, and every branching onset must obey two principles: the Sonority Sequencing Generalization (Jespersen 1904; Selkirk 1982; henceforth SSG) and Minimal Sonority Distance (Vennemann 1972; Steriade 1982; henceforth MSD).

Both principles assume the existence of a universal sonority scale, whereby all natural classes of sounds are ranked according to their sonority. Thus, vowels are the most sonorous segments in a language, while obstruents are the least sonorous. The scale employed in Mateus and d'Andrade (2002) for Portuguese is given in (1).

- (1) Sonority Scale  
 vowels > glides > liquids > nasals > obstruents

SSG states that the sonority of segments must increase towards the nucleus of the syllable. While a combination of obstruent + liquid would be fine from the perspective of SSG, the reverse would violate it and therefore would not constitute an admissible onset cluster.

The MSD principle introduces yet another limitation. It stipulates that every language specifies a minimal sonority difference between pairs of segments belonging to the same syllable constituent.

In the case of Portuguese, the required distance is 2 “steps” on the sonority scale. Thus, the language allows combinations of obstruent + liquid or nasal + glide, but a cluster of obstruent + nasal would be considered illicit, because in the latter case the distance is 1. Note that obstruent + nasal is acceptable from the perspective of SSG. Some examples of permitted and disallowed clusters are provided in (2).

- (2) (a) Permitted onset clusters
- |                   |  |
|-------------------|--|
| plosive + tap     | [pɾ], [br], [tɾ], [dɾ], [kɾ], [gɾ]<br>e.g., <i>branco</i> “white,” <i>abraço</i> “embrace” |
| plosive + lateral | [pl], [bl], [tl], [kl], [gl]<br>e.g., <i>plano</i> “plan” <i>repleto</i> “full”            |
| nasal + glide     | [mj], [mw], [nj]<br>e.g., <i>miúdo</i> [mjúdu] “kid” <i>moeda</i> [mwédɐ] “coin”           |
- (b) Disallowed onset clusters
- |                     |                                  |
|---------------------|----------------------------------|
| plosive + fricative | e.g., *[tf], *[bʃ], *[pʒ], . . . |
| fricative + nasal   | e.g., *[fn], *[ʃm], *[vɲ], . . . |
| nasal + liquid      | e.g., *[ɲl], *[mʎ], *[nr], . . . |

## 2.2 Coda

The restrictions on the Portuguese coda seem even more rigid than in the case of onsets. First, only singleton codas are allowed, which means that no clusters can occur.

Second, the only segments which can form a permitted coda are [t r ʃ ʒ], the last of these resulting from voice assimilation of [ʃ] before voiced consonants. Some examples are given in (3).

(3) Permitted coda segments

|                                |                                   |
|--------------------------------|-----------------------------------|
| [r] <i>ter</i> [ter] “to have” | <i>porto</i> [por.tu] “harbor”    |
| [t] <i>sal</i> [sał] “salt”    | <i>caldo</i> [kał.du] “broth”     |
| [ʃ] <i>paz</i> [paʃ] “peace”   | <i>pasto</i> [paʃ.tu] “pasture”   |
| [ʒ]                            | <i>Lisboa</i> [liʒ.bo.ɐ] “Lisbon” |

## 2.3 Exceptional Words

The Portuguese lexicon contains a set of words which seem to violate the constraints laid out in the preceding sections. Some are presented in (4) below. Note that the underlined clusters in the right-hand column cannot be heterosyllabic: the two segments must not be syllabified into the onset because of SSG and MSD, but the first cannot be part of the coda because of the condition presented in Section 2.2.

(4) Selected exceptional words

|   |                                    |
|---|------------------------------------|
| [pt] <i><u>p</u>terio</i> “pterion”       | <i>cap<u>t</u>ar</i> “to capture”  |
| [bd] <i><u>b</u>delio</i> “bdellium”      | <i>ab<u>d</u>omen</i> “abdomen”    |
| [kt] <i><u>c</u>tenoforo</i> “ctenophore” | <i>pac<u>t</u>o</i> “pact”         |
| [pn] <i><u>p</u>neu</i> “tyre”            | <i>ap<u>n</u>eia</i> “apnea”       |
| [gn] <i><u>g</u>nomo</i> “gnome”          | <i>diag<u>n</u>ose</i> “diagnosis” |
| [tm] <i><u>t</u>mese</i> “tmesis”         | <i>rit<u>m</u>o</i> “rhythm”       |
| [mn] <i><u>m</u>nemonics</i> “mnemonic”   | <i>am<u>n</u>esia</i> “amnesia”    |

Mateus and d’Andrade (2002) present multiple arguments for the fact that the examples in (4) are indeed exceptional. One of the claims concerns the manner in which Portuguese children handle such cases during language acquisition. It is pointed out that learners have a tendency, at some stage, to insert a vowel in order to split offending clusters, such as those in (4). However, they do not do so in the case of admissible onsets, (2a). Thus, it is not uncommon for a child to render the word *pneu* “tyre” as [pinew], whereas *prato* “dish” pronounced as \*[piratu] is unattested.

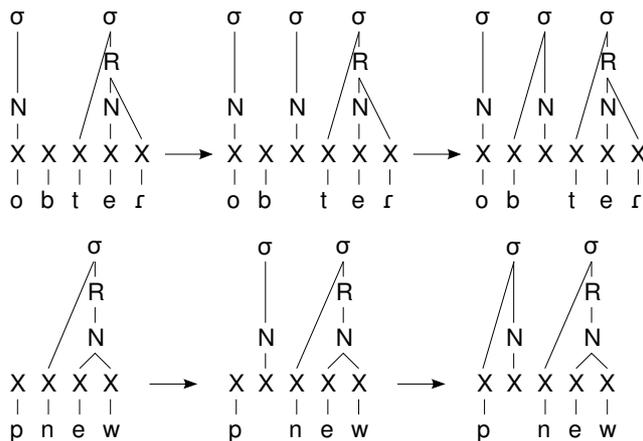
Another argument in favor of the exceptional status of the words in (4) pertains to colloquial speech. Some speakers tend to split the problematic clusters by inserting a vowel in a process analogous to the one applied by children. Furthermore, the variant of Portuguese spoken in Brazil shows similar behavior, except that the epenthetic

segment is [i] rather than [ĩ]. Thus, in Brazilian Portuguese *pneu* is pronounced [pinew], but \*[piratu] instead of [pratu] is unattested.

Finally, native speaker intuitions seem to lend further support to the claim of the exceptional status of forms in (4). It has been observed that speakers vary in their approach to the syllable division of words such as *captar* ‘to capture’ (d’Andrade and Viana 1993). They hesitate when asked to decide whether [p] is part of the onset or rather of the coda of the preceding syllable. On the other hand, no such variation is observed in, e.g., *abraço* ‘embrace,’ where the cluster [br] is usually perceived as tautosyllabic.

These observations have led the authors to postulate a different structure for the data in (4) than in the case of (2a), where the clusters do not violate any requirements. The proposed solution entails the insertion of an empty nucleus, that is, a syllable nucleus that has no melodic correspondent, to split offending clusters. Consequently, a form such as *obter* ‘to obtain’ becomes trisyllabic at the phonological level: in the second syllable, the [b] is the onset of the syllable erected over an empty nucleus, and the final syllable is comprised of the remaining segments [ter]. Similarly, *pneu* ‘tyre’ is analyzed as disyllabic, with an empty nucleus splitting the initial consonantal cluster. The structure of the two forms is presented in (5).

(5) Insertion of empty nuclei after extrasyllabic<sup>1</sup> consonants



<sup>1</sup> Extrasyllabic consonants are consonants which cannot be part of any syllable constituents because of requirements such as SSG or MSD.

## 2.4 Unstressed Vowel Deletion

In contemporary Portuguese it is customary not to pronounce unstressed mid front vowels. While / $\epsilon$  e/ are reduced to [i] in careful speech, in casual conversation the vowel tends to be deleted altogether, irrespective of the context.

This results in another set of violations in the onset (6a) and in the coda (6b). It seems that some of the examples pay no heed to SSG and MSD as they contain clusters of four or more consonants. Recall that Portuguese onsets only allow two segments, whose selection is rigidly restricted.

### (6) Exceptions stemming from [i]-deletion

#### (a) Violations in the onset

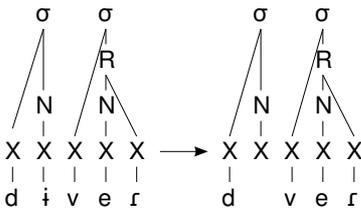
|                                | careful speech | casual speech |
|--------------------------------|----------------|---------------|
| <i>dever</i> “to owe”          | [dívér]        | [dvér]        |
| <i>separar</i> “to divide”     | [sipɛrár]      | [spɛrár]      |
| <i>pequeno</i> “small”         | [pikénu]       | [pkénu]       |
| <i>devedor</i> “debtor”        | [dividór]      | [dvdór]       |
| <i>despegar</i> “to unstick”   | [dijpigár]     | [dfpgár]      |
| <i>desprezar</i> “to unfasten” | [dijprigár]    | [dfprgár]     |

#### (b) Violations in the coda

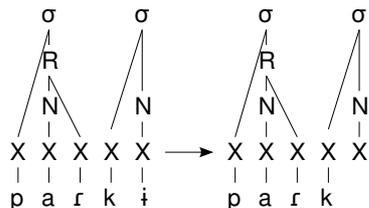
|                          | careful speech | casual speech |
|--------------------------|----------------|---------------|
| <i>bate</i> “s/he beats” | [bátɨ]         | [bát]         |
| <i>pente</i> “comb”      | [pétɨ]         | [pét]         |
| <i>cidade</i> “town”     | [sidádi]       | [sidád]       |
| <i>romance</i> “romance” | [rumêsi]       | [rumêš]       |
| <i>parque</i> “park”     | [párki]        | [párk]        |

One might extend the analysis based on empty nuclei and assume that when [i] is deleted, the prosodic structure of the word remains. This is illustrated in (7a) for *dever* “to owe” and (7b) for *parque* “park.”

### (7) (a) [i]-deletion in *dever* “to owe”



(b) [i]-deletion in *parque* “park”



### 3. Problems in the Rule-Based Approach

The problem with the analysis presented above is that it makes incorrect predictions regarding the process of nasal coalescence in Portuguese. The generalization is illustrated by the pair of indefinite articles: the masculine *um* [ũ] and the feminine *uma* [umə].

It can be observed that while a nasal consonant belonging to the same syllable merges with the preceding vowel, the process does not apply if the nasal is part of the following syllable.<sup>2</sup> Other examples illustrating the process are given in (8).

- |                                      |                                   |
|--------------------------------------|-----------------------------------|
| (8) Nasal coalescence in Portuguese  |                                   |
| <i>uma</i> [u.mə] indef. art. (fem.) | <i>um</i> [ũ] indef. art. (masc.) |
| <i>sonoro</i> [su.no.ru] “voiced”    | <i>som</i> [sõ] “sound”           |
| <i>final</i> [finalʃ] “final”        | <i>fim</i> [fi] “end”             |

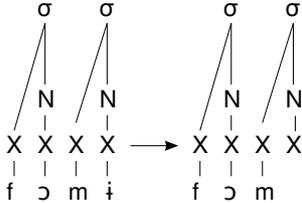
The process may also apply in, e.g., *fome* “hunger,” where it is fed by unstressed vowel deletion. Dropping the final *e* creates the context for nasalization to apply: [fõmi] changes to [fõm] through [i]-deletion, and subsequently becomes [fõ] via coalescence.

Note that this could not happen under the assumptions we have made so far. For the examples in (6), we established that the rule of [i]-deletion should operate only on the melodic tier. In other words, no changes should be made in the prosodic structure of the vowel. The empty nucleus that was obtained enabled us to account for the illicit clusters in *dever* [dver] “to owe” (7a) and *parque* [park] “park” (7b).

2 Note that the nasal consonants in the left-hand column cannot be the result of insertion as their place of articulation is not predictable. We will therefore assume that nasal vowels in Portuguese are underlyingly disegmental, that is, that they are represented as a sequence of an oral vowel followed by a nasal stop, as first suggested for Brazilian Portuguese by Trager (1943a; b) and later substantiated in numerous studies (e.g., Mattoso Câmara 1953;1970; Morales-Front and Holt 1997). The nasal consonant is either deleted following nasalization or the two sounds merge into one segment (coalescence) which retains certain features of both input segments. We disregard this issue as it is irrelevant for the purposes of this analysis.

By the same token, after final vowel deletion in *fome* “hunger” the nasal consonant should still occupy the onset position of the second syllable erected above the empty nucleus. This is illustrated in (9).

(9) [i]-deletion in *fome* “hunger”

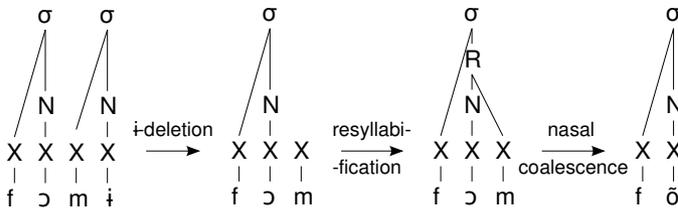


Assuming the structure in (9), it seems impossible to derive the form [fõ] with a nasal vowel. Since the nasal consonant belongs to the second syllable, there is no context for coalescence. We therefore believe that two adjustments of the model that has been presented are necessary.

Firstly, [i]-deletion should be reformulated to operate not just on the melodic tier, but rather to affect the segment together with its prosody. As a result, the second syllable in *fome* ceases to exist as it no longer has a nucleus. The nasal [m] becomes extrasyllabic.

The second adjustment involves expanding the group of possible coda consonants in Portuguese to include nasal consonants in addition to [ʃ r f ʒ]. Otherwise the consonant [m] in *fome* would remain unprosodified and would most probably be deleted. An illustration of the derivation of *fome* “hunger” is provided in (10).

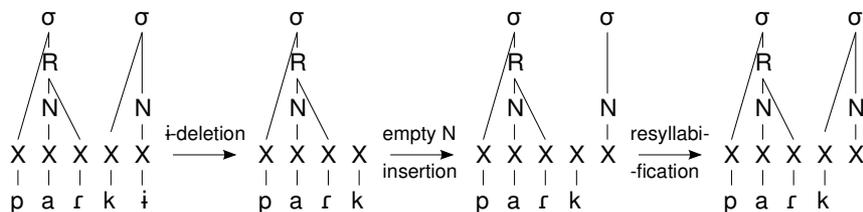
(10) Derivation of *fome* “hunger”



However, this solution is admittedly controversial. It entails allowing a whole new class of sounds (nasal consonants) to appear in the syllable coda even though nasals are never found in that position on the phonetic level. In other words, the only reason for [m] in *fome* to appear in the coda of the first syllable would be to generate the context for nasal coalescence, the purpose of which is to eliminate nasals from the coda. This is why we argue for the superiority of the constraint-based approach, which is free of such controversies.

Changing the status of [i]-deletion to include the entire prosodic structure presents us with yet another difficulty. After the process applies in *parque* [park] “park,” the second syllable, which no longer has a nucleus, is eradicated and the final consonant [k] becomes extrasyllabic. It cannot form a branching coda with [r] because of the limitations on the shape of the coda laid out in Section 2.2. In order to prevent the velar plosive from being erased, an empty nucleus must appear after it so that [k] can attach to the onset of the vowelless syllable that is obtained. This is shown in (11).

(11) Derivation of *parque* “park”



As can be observed, the final timing slot is deleted during [i]-deletion, only to be reinserted again when the empty nucleus is added. This hints at a Duke-of-York type of derivation (see Pullum 1976): in the course of the derivation there are two separate processes, such that the latter cancels the former out. In the end it seems no change was introduced and the input and output are identical.

Moreover, it is now necessary to postulate two separate empty nucleus insertion rules: one to handle cases like *parque* “park” and all the other forms in (6a) and (6b), and another to account for the examples in (4), such as *pneu* “tyre,” where the illicit cluster does not stem from vowel deletion. This complicates the analysis and introduces a high level of abstractness which may be difficult to accept.

The next section presents an analysis of the Portuguese data in Optimality Theory. We argue that the constraint-based framework offers a unified approach to the aforementioned problems and is therefore a better tool for the analysis of the conspiracies presented here that aim to repair the syllable structure.

### 4. Optimality Theory

Optimality Theory (Prince and Smolensky 1993/2004; McCarthy and Prince 1995; OT henceforth) models grammar using violable constraints rather than sequentially ordered rules. For any given input, a set of possible surface forms is generated and then evaluated in parallel against a language-specific constraint hierarchy. From the perspective of OT, the restrictions on Portuguese syllable structure can be expressed as the following constraints.

- (12) (a) COMPLEX(Coda): branching codas are not permitted  
(Prince and Smolensky 1993/2004, 96)
- (b) SSG: consonants in syllable margins are sequenced in accordance with the sonority scale.
- (c) MSD(2): the minimum sonority distance between the two elements of a complex onset is 2.
- (d) CODACONDITION: only [ɹ, ɻ, ʃ, ʒ] are permitted in the syllable coda.  
(adapted from Itô 1988)

Below we will show that the constraints responsible for syllable structure listed in (12), undominated in Portuguese, are the driving force behind three disparate processes: the insertion of empty nuclei, nasal coalescence, and the deletion of material on the melodic tier to the exclusion of the higher structure in casual speech. Further key constraints will be introduced as they become relevant to the analysis.

#### 4.1 Exceptional Words

The words discussed in Section 2.3 all contain segments that cannot be syllabified without violating at least one of the constraints on syllable structure. To take a concrete example, the /b/ sound in *obter* ‘to obtain’ would violate CODACONDITION if it were assigned to the coda of the first syllable. However, adjoining it to the onset of the second syllable would incur a violation of both MSD(2) and SSG. In principle, a number of different paths could be taken in such a situation, including leaving the /b/ unsyllabified, deleting it, or inserting a vowel. Each of these strategies comes at a cost, as the resulting forms violate high-ranked constraints, listed in (13).

- (13) (a) PARSE(Seg): melodic segments must be parsed into prosodic structure.  
(Prince and Smolensky 1993/2004, 25)
- (b) MAX(C): every consonant in the input has a correspondent in the output (“do not delete consonants”).  
(McCarthy and Prince 1995, 16)
- (c) DEP(Root): every root node in the output has a correspondent in the input (“do not insert a Root node”).  
(McCarthy and Prince 1995; Lombardi 1998)

Portuguese responds to such structures by inserting an empty nucleus, thus allowing the /b/ sound to form a simple onset. This indicates that the constraints banning the insertion of segments<sup>3</sup> (14a) and against empty structural positions (14b) must be ranked lower than the constraints in (13).

(14) (a) DEP(Seg): every segment in the output has a correspondent in the input (“do not insert segments”).

(McCarthy and Prince 1995, 16)

(b) FILL: structural positions should be filled

(Prince and Smolensky 1993/2004, 25; Pólgardi 1996, 12)

The interaction of the constraints mentioned above is illustrated in table (15).

(15) Evaluation of *obter* “to obtain”<sup>4</sup>

| /obter/           | CODACOND | COMPLEX(Coda) | SSG | MSD(2) | PARSE(Seg) | DEP(Root) | MAX(C) | DEP(Seg) | FILL |
|-------------------|----------|---------------|-----|--------|------------|-----------|--------|----------|------|
| (a) [ob.ter]      | *!       |               |     |        |            |           |        |          |      |
| (b) [o.bter]      |          |               | *!  | *      |            |           |        |          |      |
| (c) [o(b)ter]     |          |               |     |        | *!         |           |        |          |      |
| (d) [o.bi.ter]    |          |               |     |        |            | *!        |        | *        |      |
| ☞ (e) [o.b_ .ter] |          |               |     |        |            |           |        | *        | *    |
| (f) [o.ter]       |          |               |     |        |            |           | *!     |          |      |

Candidates (15a) and (15b) both contain illicit syllable margins and are eliminated by the high-ranked constraints on syllable structure. Candidate (c), with an extrasyllabic consonant, incurs a fatal violation of PARSE(Seg), which requires melodic segments to be syllabified. The remaining candidates deviate from the input, thus violating the faithfulness constraints. Of these, DEP(Root), which prohibits the insertion of melodic material, and MAX(C), which prohibits consonant deletion, result in the elimination of candidates (15d) and (15f), respectively. Candidate (15e) represents a minimal

3 In the x-skeletal theory of representation assumed here, segments are represented by x-slots.

4 Here and below, a dot represents a syllable boundary. Unsyllabified segments are enclosed in parentheses, while empty nuclei are represented by an underscore.

departure from the input. It fares well on the high-ranked DEP(Root), because no melody is inserted. While it violates FILL and DEP(Seg), these constraints are ranked too low to have any effect. As a result, candidate (15e) emerges as the winner.

Table (16) illustrates the evaluation of a word in which an unsyllabifiable segment is word-initial rather than word-medial. Here, the candidate with an empty nucleus splitting the initial cluster (16e) is again selected as optimal.

(16) Evaluation of *pneu* ‘tyre’

| /pneu/        | CODACOND | COMPLEX(Coda) | SSG | MSD(2) | PARSE(Seg) | DEP(Root) | MAX(C) | DEP(Seg) | FILL |
|---------------|----------|---------------|-----|--------|------------|-----------|--------|----------|------|
| (a) [pneu]    |          |               |     | *!     |            |           |        |          |      |
| (b) [(p)neu]  |          |               |     |        | *!         |           |        |          |      |
| (c) [pi.neu]  |          |               |     |        |            | *!        |        | *        |      |
| ☞ (d) [p_neu] |          |               |     |        |            |           |        | *        | *    |
| (e) [neu]     |          |               |     |        |            |           | *!     |          |      |

## 4.2 Nasal Coalescence

Before we can proceed to an analysis of the casual speech data, it is necessary to determine the constraint ranking that will produce nasal coalescence in words such as the masculine indefinite article [ũ], derived from underlying /um/ (cf. the feminine indefinite article *uma* [umə]). The key to the analysis is the observation that a fully faithful candidate [um], in which the nasal sound has been syllabified into the coda, violates CODACONDITION, because [m] is not a licit coda consonant. Consequently, the output candidates will include the same repair strategies (extrasyllabicity, deletion, and insertion) used for the exceptional words discussed in Section 4.1, and the same constraints will be violated. One might then think that under the current ranking, the candidate that will be selected as optimal is [u.m\_], with an empty nucleus. However, forms which contain a nasal segment as a potential coda consonant behave differently than forms that contain oral consonants. The reason is that for /um/ one more candidate is generated, in which the vowel and the nasal sound have merged into a single segment. This candidate satisfies all the high-ranked constraints, and emerges as the winner, as shown in table (17).

(17) Evaluation of *um* (masc. indef. article)

| $/u_1m_2/$                | CODA COND | COMPLEX(Coda) | SSG | MSD(2) | PARSE(Seg) | DEP(Root) | MAX(C) | DEP(Seg) | FILL | UNIFORMITY |
|---------------------------|-----------|---------------|-----|--------|------------|-----------|--------|----------|------|------------|
| (a) $[u_1m_2]$            | *!        |               |     |        |            |           |        |          |      |            |
| (b) $[u_1(m_2)]$          |           |               |     |        | *!         |           |        |          |      |            |
| (c) $[u_1.m_2i]$          |           |               |     |        |            | *!        |        | *        |      |            |
| (d) $[u_1.m_2_]$          |           |               |     |        |            |           |        | *!       | *    |            |
| (e) $[u_1]$               |           |               |     |        |            |           | *!     |          |      |            |
| ☞ (f) $[\tilde{u}_{1,2}]$ |           |               |     |        |            |           |        |          |      | *          |

Candidate (17a), with the nasal sound parsed into the coda, is eliminated by a constraint on syllable structure. Just like in the previous table, the candidate with an extrasyllabic segment, (17b), is ruled out by *PARSE(Seg)*, while the candidates that employ insertion (17c) or deletion (17e) fatally violate *DEP(Root)* and *MAX(C)*, respectively. In this evaluation, however, the previously dormant *DEP(Root)* and *FILL* constraints now become decisive in choosing between candidate (17d), with an empty nucleus, and candidate (17f), with nasal coalescence. Importantly, candidate (17f) satisfies *DEP(Seg)*. The constraint requires every segment in the input to have a correspondent in the output, which is true in the case of coalescence, where it is assumed that the surface segment corresponds to both underlying ones. As a result, it is candidate (17f), rather than candidate (17d), that becomes the winner. Naturally, candidate (17f) is also imperfect. The constraint it violates is *UNIFORMITY*, prohibiting coalescence. Because the constraint is low-ranked, it has no effect on the evaluation.

(18) *UNIFORMITY*: no element of the output has multiple correspondents in the input (“no coalescence”).

(McCarthy and Prince 1995, 66)

As has been shown, European Portuguese responds in two different ways to forms which could potentially violate the constraints on syllable structure. When the troublesome consonant is oral, it gets support from an additional empty nucleus. When it is nasal, it merges with the preceding vowel. The next section will illustrate the third strategy, used when unsyllabifiable consonants are the result of the casual speech process of vowel deletion.

### 4.3 Casual Speech

To account for [i]-deletion in casual speech, another constraint needs to be introduced. \*i is a standard segment inventory constraint that prohibits the appearance of the vowel [i] in surface forms. To compel deletion, in casual speech \*i must be ranked above MAX(V), which requires the preservation of underlying vowels.

(19) (a) \*i: vowel i is prohibited

(b) MAX(V): every vowel in the input has a correspondent in the output (“do not delete vowels”).

(McCarthy and Prince 1995, 16)

As shown in Section 1.4, [i]-deletion leads to apparent violations of the constraints on syllable structure. To illustrate this, consider the word *parque* ‘park,’ pronounced [parki] in careful speech. When the final vowel is deleted in casual speech, it exposes a word-final /k/ sound, which is not a permissible coda. However, the constraint ranking established so far ensures that the only thing that gets deleted in rapid speech is the melodic material. As a result, the prosodic structure above it remains intact and the /k/ sound can remain in the onset, thus satisfying the constraints on syllable codas. This is illustrated in table (20).

(20) Evaluation of *parque* ‘park’ (casual speech)<sup>6</sup>

| /parki/ <sup>6</sup> | *i | CODACOND | COMPLEX(Coda) | PARSE(Seg) | DEP(Root) | MAX(C) | DEP(Seg) | FILL | MAX(V) | UNIFORMITY |
|----------------------|----|----------|---------------|------------|-----------|--------|----------|------|--------|------------|
| (a) [par.ki]         | *! |          |               |            |           |        |          |      |        |            |
| (b) [par(k)]         |    |          |               | *!         |           |        |          |      | *      |            |
| (c) [park]           |    | *!       | *             |            |           |        |          |      | *      |            |
| ☞ (d) [par.k_]       |    |          |               |            |           |        |          | *    |        |            |
| (e) [par]            |    |          |               |            |           | *!     |          |      | *      |            |

5 Although the final vowel in *parque* is underlyingly an /e/ that turns into an [i] through the process of vowel reduction, in the present analysis we assume for the sake of simplicity that the final vowel is underlyingly an /i/. For an OT analysis of vowel reduction in Portuguese, see Coetzee (2004).

6 For compactness, constraints on the well-formedness of onsets have been omitted, as they are irrelevant to this evaluation.

The fully faithful candidate (20a), optimal in careful speech, is now ruled out because of its violation of \*i. Candidates (20b), (20c) and (20d), in which the vowel is deleted together with the skeletal and prosodic structure above it, are all suboptimal as they all employ a variety of strategies to save the stranded /k/ sound. Specifically, candidate (20b) leaves the /k/ unsyllabified, thereby violating PARSE(Seg), candidate (20c) syllabifies the sound into the coda, violating both CODACONDITION and COMPLEX(Coda), and candidate (20e) deletes it, violating MAX(C). In candidate (20d), where only the melodic material has been deleted, /k/ remains in the onset of the second syllable. The candidate does not violate any of the high-ranked constraints in order to repair its syllable structure and consequently emerges as the winner.

Recall, however, that in the derivational analysis removing melody only predicted incorrect results for forms such as *fome* ‘‘hunger,’’ deriving [fõ.m\_], with an empty nucleus, rather than the attested [fõ]. In an OT analysis, this is no longer a problem. When the consonant that would remain stranded after [i]-deletion is nasal, leaving the prosodic structure intact (and thus allowing an empty nucleus in the surface representation) is not the least costly strategy to circumvent CODACONDITION. This is illustrated in table (21).

(21) Evaluation of *fome* ‘‘hunger’’ (rapid speech)

| /f <sub>1</sub> o <sub>2</sub> m <sub>3</sub> i <sub>4</sub> /      | *i | CODA<br>COND | COMPLEX<br>(Coda) | PARSE<br>(Seg) | DEP<br>(Root) | MAX<br>(C) | DEP<br>(Seg) | FILL | MAX<br>(V) | UNI<br>FORMITY |
|---|----|--------------|-------------------|----------------|---------------|------------|--------------|------|------------|----------------|
| (a) [f <sub>1</sub> o <sub>2</sub> .m <sub>3</sub> i <sub>4</sub> ] | *! |              |                   |                |               |            |              |      |            |                |
| (b) [f <sub>1</sub> o <sub>2</sub> (m <sub>3</sub> )]               |    |              |                   | *!             |               |            |              |      | *          |                |
| (c) [f <sub>1</sub> o <sub>2</sub> m <sub>3</sub> ]                 |    | *!           |                   |                |               |            |              |      | *          |                |
| (d) [f <sub>1</sub> o <sub>2</sub> .m <sub>3-4</sub> ]              |    |              |                   |                |               |            |              | *!   |            |                |
| (e) [f <sub>1</sub> o <sub>2</sub> ]                                |    |              |                   |                |               | *!         |              |      | *          |                |
| ☞ (f) [f <sub>1</sub> õ <sub>2,3</sub> ]                            |    |              |                   |                |               |            |              |      | *          | *              |

The fully faithful candidate (21a) is again eliminated because of its violation of the high-ranked \*i constraint. Candidate (20b), in which the nasal segment remains unsyllabified, violates PARSE(Seg). Candidate (20c) fatally violates CODACONDITION and candidates (20d–e), which try to satisfy this constraint by retaining the x-slot (20d) or by deleting the nasal segment (20e), violate CODACONDITION and MAX(C), respectively. Candidate (20f) satisfies all the high-ranked constraints and becomes the winner.

## 5. Conclusions

A derivational account of Portuguese syllable structure involves a number of unintuitive operations that are necessary to account for all the data. These include attaching /m/ into the coda in words like the masculine indefinite article [ũ] only to create the context for nasal coalescence, and a Duke-of-York derivation in words like *parque* “park,” where a vowel is deleted together with the accompanying x-slot but the x-slot is then reinserted to provide support for an extrasyllabic consonant. The OT approach is not only free of these controversies but also permits us to view three disparate processes as united in an effort to achieve a single goal. The deletion of melodic material, insertion of empty nuclei and nasal coalescence all seem to form part of a conspiracy against ill-formed syllable margins. While in the derivational approach multiple, formally unrelated, rules are required to achieve these results, Optimality Theory offers a way of expressing the connection between the three processes. This is done straightforwardly by ranking the constraints controlling syllable structure above the constraints barring empty nuclei and coalescence. The result is a complete account of all the data under discussion, in which three disparate processes are driven by the same conditioning factors.

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