MASARYK UNIVERSITY
FACULTY OF ARTS

Studies in Nanosyntax

HABILITATION THESIS

a collection of published articles
with introduction and conclusions

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Contents

Preface

The core of this thesis is a collection of published articles dealing with various empirical and theoretical issues within morphology, with special focus on Czech. Each study investigates a different empirical phenomenon, covering jointly the areas of declension class, comparative formation, the morphological marking of numerals and number marking on nouns. What unifies the studies is the framework of analysis (Nanosyntax), and the ambition to contribute to our general understanding of some traditional issues within morphology.

The goal of each of these studies is first of all to provide an empirically adequate and theoretically insightful analysis of the dataset at hand. However, while doing so, I also pursue a specific general hypothesis about the nature of morphology, i.e., about the component of grammar responsible for generating 'inflected words.' The hypothesis is that the creation of words (morphology) follows the same rules as the creation of phrases and sentences (syntax). This entails that both morphology and syntax are seamlessly integrated within a single component of grammar. The case studies collected here represent the application of this idea to different empirical domains, thereby highlighting both their explanatory power and their limitations.

A unified approach to syntax and morphology contrasts with various other approaches to the same set of phenomena (both existing and conceivable), where morphology is considered to be a component of grammar with its own rules and principles. In fact, one of the traditional domains of inquiry within morphology has always been the study of processes that appear to be specific to morphology. 'Specific to morphology' here means 'interestingly different from what we know about how concatenation works in syntax.'

Let me elaborate on this in more detail. One of the fundamental observations about human language is that it allows us to make "an infinite use of finite means" (as stressed in the work by N. Chomsky). The way language allows us to achieve the infinite use is by allowing for the combination of smaller units together, creating larger units whose meaning is derived compositionally from the smaller pieces (a view going back at least to Frege).

Perhaps the simplest possible idea of how such combination works is the following. We take an independently existing element A expressing meaning M1 (e.g., *too*), and an independently existing element B, expressing meaning M2 (e.g., *long*). When we put A and B together, we get the string A-B, whose meaning is computed by applying M1 to M2 (*too long*). In the resulting string, there are no irregular changes that affect either A or B; A and B are simply placed one after the other.

In morphology, such a simple concatenation is called affixation. We take the root A, expressing meaning M1 (e.g., *long*), we add the grammatical meaning M2 expressed by B (e.g., *-er*),

and we combine A and B together, yielding *long-er*. This process is schematically depicted in (1).

(1) Affixation
A + B → A-B

Now the basic point about morphology is that there are many cases that apparently cannot be subsumed under the simple formula in (1). For example, taking the adjective *good* and affixing *-er* is impossible, since (standardly) there is no comparative **good-er*. Rather, we get the form *bett-er* in the intended meaning, even though there is no adjective **bett* that could serve as an input to the affixation process. Thus, for the adjective *good*, we get a pattern that can perhaps be schematized as in (2), which is interestingly different from the simple idea of concatenation like (1), and it is traditionally referred to as root suppletion.

(2) Root suppletion
A + B → C-B

The formula (2) seems morphology-specific in the sense that it requires something more than a pure concatenation of two independently existing items. The idea that this pattern is specific to morphology is strengthened by the observation that in cases of syntactic combination like *too tall*, one very rarely (if ever) gets cases that fall under the root-suppletion scenario (2). In other words, examples like **too bett* seem not to exist, while cases like *bett-er* do (an observation made in work by J. Bobaljik).

A case similar to root suppletion is 'affix suppletion,' traditionally referred to as allomorphy. Allomorphy refers to cases where it is not the root that undergoes unpredictable changes under affixation, but instead it is the affix. For example, we find cases where the affix has a regular shape used with most roots in the language (*fox-**es***, *rake-**d***), but a special shape with a handful of special roots (*ox-**en***, *take-**n***). The irregular cases could then be perhaps depicted as in (3).

(3) Allomorphy
A + B → A-C

Allomorphy may also be understood differently than in (3) because the view in (3) seems to presuppose that there is some basic form of an affix (B) that has an irregular realization (C). This is not always the case, and one can encounter cases of allomorphy where the two allomorphs appear with about the same frequency and it is then difficult to say which of them is basic. Allomorphy is then perhaps better understood more generally as a phenomenon where a particular morphological category (plurality, tense) is expressed by different affixes depending on the (class of the) root.

However, regardless of how we think about allomorphy and root suppletion, the main point is

that we observe the sensitivity of one member of the string A-B to the presence and/or the properties of the other member. This reveals that in both cases, the two pieces are not independent of each other in the same way as words are (a point often made in Word-and-Paradigm models). This makes it harder to propose that words and phrases arise as the result of applying one and the same operation to their constituent parts. Since if the operation is the same, why would the results be interestingly different.

As the final relevant case, consider the comparative of the adjective *bad*. Affixing *-er* to this adjective is (standardly) impossible – just as in the case of *good*. However, the actual form (*worse*) is of a different type than *bett-er*, where we could recognize at least one of the assumed original pieces. In the case of *worse*, we seem to have just a single non-decomposable morpheme stepping in for what other adjectives express as a combination of smaller pieces. This case, traditionally referred to as portmanteau marking, is depicted in (4).

(4) Portmanteau
$A + B \rightarrow C$

I have already mentioned that the main idea to be defended here is that such issues notwithstanding, words and phrases are assembled by one and the same computational system. This, however, does not mean that I shall be avoiding the discussion of these potentially difficult cases; on the contrary, they are the most interesting cases to look at if one wants to show that the hypothesis explored here represent a viable approach to morphology.

The studies collected in this thesis thus investigate such and similar phenomena from the perspective of my main hypothesis. The analyses are formulated within a specific framework of analysis (developed by M. Starke), called Nanosyntax. Its basic idea is that the process of concatenation does not operate over morphemes like A or B, but rather over much smaller units of meaning, namely individual morphosyntactic features. Morphemes are inserted late, possibly as a realization of multiple features.

The organization of the thesis is as follows. In the first introductory chapter (*Minimalism and Nanosyntax: reconciling Late Insertion and the Borer-Chomsky conjecture*), I describe the essential properties of the Nanosyntax framework in relation to mainstream minimalist theories. This introductory chapter (of which I am the single author) has been written as an invited contribution to a planned volume entitled *The Cambridge Handbook of Minimalism*, edited by Kleanthes Grohmann and Evelina Leivada, planned for publication with Cambridge University Press. The contribution has been read by two anonymous reviewers, revised according to their comments and accepted for inclusion by the editors. It has not been published yet.

The second chapter deals with the Russian declension. Its main focus is the allomorphy of case/number markers found on Russian nouns. The chapter puts forth a particular proposal for allomorphy and discusses the issue of why different declension classes should exist to begin with, given that they do not apparently contribute to the meaning of the form. The chapter was

published in 2021 as an article in *Acta Linguistica Academica*.

The third chapter deals with the allomorphy of comparative marking in Czech, with brief detour on English and Old Church Slavonic. The theory of allomorphic variation explored here is the same as the one described for Russian in chapter 2, thereby strengthening the case for a general applicability of a theory along these lines. In addition, the chapter incorporates root suppletion and portmanteau marking within the same general framework of analysis. The chapter was published in 2019 in *Studia Linguistica*, and I am a co-author on the article jointly with Karen De Clercq (Université de Paris) and Guido Vanden Wyngaerd (KU Leuven). I highlight the contribution of individual authors at the beginning of the article in the relevant chapter.

The fourth chapter is a joint work with Marcin Wągiel (Masaryk University). The chapter deals with the morphological marking of two different kinds of numerals: one kind used for counting objects (***three*** chairs), the second kind using for abstract counting (***three*** *times two is six*). In the study, we recognize three different types of morphological relations between the two different numeral types: affixation, suppletion and syncretism. We show how the morphological typology of apparently different numeral systems can be modeled using the tools described in the previous chapters. The study has been published in 2021 in the journal *Acta Linguistica Academica.* I describe my own contribution to the study at the start of the relevant chapter.

The fifth chapter contains the article entitled *The marking of mass, count and plural denotations in multi-dimensional paradigms.* It has been published in 2021 (as an "Early access" article) in *Studia Linguistica*, and it is ultimately scheduled to appear in an issue of the 2022 volume. My original motivation for writing this article was the desire to understand the syncretism between the genitive singular case and the nominative plural case. This syncretism is found in quite a few Slavic languages, e.g., all feminine nouns in Czech exhibit this particular phenomenon. What is interesting about this syncretism is that it is unclear what the two cases actually have in common; it appears that their meaning is not related at all.

This type of syncretism between two unrelated forms has sometimes been considered as a case in favor of a special morphological rule called 'Rule of Referral' (developed in work by A. Zwicky and G. Stump). What these rules allow is that a particular form is supplied by looking at a different form within the same paradigm; e.g., the marking of the nominative plural is simply copied from the genitive singular case. The consequence of this proposal is that some words (the nominative plural in this case) are not formed by regular composition, assembling smaller pieces into larger chunks; rather, the whole word is copied from elsewhere, regardless of whether it has any smaller pieces inside it and regardless of what these pieces are and what they mean. This is then yet another way of making morphology 'special' and different from syntax.

In the article (i.e., in *The marking of mass, count ...*), I provide an explanation for this syncretism that does not rely on the existence of such rules, and use instead the very same theory as employed throughout the studies contained in this thesis. In addition, the study also shows how Nanosyntax can model paradigm gaps, another phenomenon that may be considered as a

potential piece of evidence against syntax-based approaches.

In sum, what I want to show in this thesis is that a system like Nanosyntax is perfectly capable of incorporating a large amount of the traditional 'morphological' data, including allomorphy, arbitrary declension classes, paradigm gaps, root suppletion, portmanteau marking and 'crazy' syncretisms. It is precisely this type of phenomena that make it tempting to conceive of morphology as the study of the irregular, or simply as special and different from the regular concatenation known from syntax. What I hope to demonstrate is that the apparent deviations listed in this preface do not represent an obstacle to a theory where syntax and morphology are integrated within a single seamless system.

My pre-final note is the following: I am submitting this thesis as a habilitation thesis in the area of Czech linguistics. The relevance of Czech data to this work is clear in some chapters, but perhaps less obvious in others. As a general strategy, I therefore start each study with a brief information on its background, its relation to Czech, and also, where relevant, information about the role of various authors in co-authored studies.

The final note concerns the layout of this thesis. The current thesis mostly contains published articles. In order to make sure that the version of the article included in this thesis is identical to the published version, I include these articles with the layout provided by the publisher. Therefore, the articles include a header, which contains information about the journal and page-number within the journal. In order to also provide a uniform pagination throughout this thesis, the layout of this collection contains a footer, which serves this purpose, i.e., providing a uniform pagination throughout this thesis. The bibliographical information for the studies included in this thesis (chapters 2-5) is summarized below my signature.

Pavel Caha
Brno, January 15, 2022

References

Caha, Pavel. 2021a. Modeling declensions without declension features. The case of Russian. *Acta Linguistica Academica* 67. 385–425. https://doi.org/10.1556/2062.2021.00433.

Caha, Pavel. 2021b. The marking of mass, count and plural denotations in multi-dimensional paradigms. *Studia Linguistica* Early access. 1–63. https://doi.org/10.1111/stul.12183.

Caha, Pavel, Karen De Clercq & Guido Vanden Wyngaerd. 2019. The fine structure of the comparative. *Studia Linguistica* 73(3). Estimated authorship: 33%, 470–521. https://doi.org/10.1111/stul.12107.

Wągiel, Marcin & Pavel Caha. 2021. Complex simplex numerals. *Acta Linguistica Academica* 68(4). Estimated authorship: 40%, 470–515. https://doi.org/10.1556/2062.2021.00460.

1 Introduction: Reconciling Late Insertion and the Borer-Chomsky Conjecture

Pavel Caha

1.1 Introduction

Nanosyntax (Starke 2009; 2018) is an approach within the Principles & Parameters framework, which shares with standard minimalist theories (Chomsky 1995 et seq.) the idea that the core of syntax consists in a bottom-up application of (external and internal) Merge, which is arguably the main (and perhaps only) syntactic operation. The Nanosyntax framework can be easily distinguished within current approaches by its adherence to three core ideas, given under (i)-(iii) below. (i) The first crucial ingredient is the idea that the atoms of syntax are just single features (which is similar to 'One Feature – One Head' in Cinque & Rizzi 2010). (ii) The second crucial ingredient is Late Insertion, i.e., the idea that the insertion of phonology and/or concepts happens after syntax (as in Distributed Morphology, Halle & Marantz 1993). (iii) The final distinguishing feature is phrasal spellout; i.e., the idea that lexical insertion targets phrasal nodes.[1]

Due to its focus on syntactic atoms (recall the first core idea above), a lot of the empirical work in Nanosyntax focuses on traditional morphological phenomena such as syncretism, allomorphy, suppletion and others. However, one of the main driving forces of this research is to show that these phenomena can be fully explained by subjecting traditional morphological features to the same set of rules as observed in phrasal syntax.

Like Minimalism, Nanosyntax makes no reference to syntax-internal levels of representation (such as Deep Structure, Surface Structure or Morphological Structure), placing much of the explanatory burden on the interface between syntax and the external systems (PF and CF). As highlighted under (iii) above, the Nanosyntactic theory of the interface is based on the idea of phrasal spellout, which assigns phonological and/or conceptual interpretation to phrasal nodes. In recent incarnations of the model, phrasal spellout is cyclic (applying after every Merge) and it must be successful at every cycle. When spellout fails, the derivation crashes at the interface and it must be repaired in specific ways, namely by (spellout-driven) movement.

[1] A brief note on history: Starke's work on Nanosyntax goes back to the early 2000s, but it has remained unpublished. In addition to Starke's (2009) article, early published sources include Caha (2007; 2009; 2010); Fábregas (2007; 2009); Pantcheva (2009; 2011); Taraldsen (2009; 2010). More recent work is cited at appropriate places in the chapter.

The current chapter looks at the three core ideas highlighted in (i)-(iii) above. In section 1.2, I describe the particular view on the atoms of language, which is at the core of the framework. In section 1.3, I turn to the crucial role that Late Insertion has in the model. In Sections 1.4, 1.5 and 1.6, I provide a more specific information about the postsyntactic lexicon and describe how its interaction with a language-invariant principles leads to cross-linguistic variation. Section 1.7 concludes by highlighting how Nanosyntax resolves one of the tensions in current Minimalist thinking, which relates to the role of the lexicon as potentially the only source of variation among languages.

The specific tension I have in mind arises when we juxtapose two independent ideas about the role of the lexicon in grammar. The first idea is Late Insertion. Late Insertion is motivated by the desideratum of making syntax fully modular. This means that syntax contains only syntactic information (but no phonological or conceptual information), because this is the only type of information syntax is sensitive to. Modularity is achieved if the lexicon comes late in the derivation, providing phonological/conceptual features only after syntax has finished its job. this view, however, leads to a tension with another idea, which is that the principles and operations of syntax are language invariant, and that the lexicon is therefore the only source of crosslinguistic variation (the so-called Borer-Chomsky conjecture).

The two ideas, while both attractive, lead to a tension. Specifically, if the lexicon is placed *after* syntax, it is difficult to see how it can influence parametric variation *inside* syntax. The point of Section 1.7 is to show how the architecture of grammar proposed in Nanosyntax resolves the tension and allows us to maintain both ideas at the same time. The key to the answer is the cyclic nature of spellout, where spellout applies after every Merge. Because of this, we get an interleaving of Merge–Spellout–Merge–Spellout etc.; as a result, there are instances of Merge that apply after spellout. That way, even though the lexicon comes in late (within each cycle, it comes after Merge), the lexicon can still be the only source of variation (because the derivation chains cycles consisting of Merge+Spellout).

1.2 The atoms

In this section, I address the nature of the elementary building blocks of syntactic structures. My starting point is the fact that one of the major changes that arrived with the Minimalist Program (Chomsky 1995) was the elimination of the syntax-internal levels of representation, Deep Structure and Surface Structure. In the new architecture, structures are no longer created by the so-called rewrite rules conforming to the general template of the X-theory. Rather, derivations now unfold in a stepwise manner, starting from a set of atoms, and combining these into ever larger trees, ultimately producing the whole sentence.

This change in perspective brings along many consequences. One of these is that in the new setting, syntactic structures are no longer made of abstract 'positions,' but rather of something

more tangible, namely of some preexisting elements, standardly referred to as syntactic atoms. As a result, the question of what the atoms are becomes of central importance.

The standard view on syntactic atoms, adopted in Chomsky's work and more or less by everyone in the field today, is that they are language-particular lexical items. In Chomsky's *Beyond Explanatory Adequacy* (2004:104, 107), the idea is described as follows: "FL appears to be a species property, close to uniform across a broad range. It has a genetically-determined initial state S_0, which determines the possible states it can assume. [...] S_0 determines the set {F} of properties ("features") available for languages. Each language makes a one-time selection of a subset [F] of {F} and a one-time assembly of elements of [F] as its lexicon [LEX]."

This view introduces a two-step procedure by which syntactic atoms (the smallest elements subject to Merge) arise from the universal features provided by the UG. The first step is a reduction: starting from the set of properties provided by the UG, each language restricts this inventory to the set of features relevant for that particular language. For instance, one language may lack PLURAL while another language has it. The second step corresponds to producing language particular groupings of the selected features: in order to form syntactic atoms, language-specific features are grouped into lexical items. This view is summarised in (1).

(1) The atoms of Merge in standard Minimalism

a. Start from {F}, the set of features provided by UG
b. Reduce {F} to the set of features used by individual languages [F]
c. Construct the atoms of Merge (LEX) as language-particular sets (assemblies) composed of language particular features, members of [F]

Ultimately, this is also the theory of how cross-linguistic differences arise, since the rules and operations of narrow syntax are assumed to be uniform across languages. The theory of variation that emerges from this picture can thus be summarised by saying that each language has different atoms, and that languages differ as a consequence of how the distinct atoms interact with the invariant narrow-syntactic computation.

This general picture, however, leaves a number of alternatives open for exploration. In particular, various theories within the Principles & Parameters framework adopt different positions on the relationship between the atoms of syntax (LEX) and the universal set of features {F}.[2] One of the central features of Nanosyntax is the hypothesis that can be expressed by the formula {F} = [F] = LEX. In words, the idea is that the set of atoms each language uses to build structures (i.e., LEX) corresponds to the set of features provided by the UG (i.e., {F}).

The hypothesis, as described above, has strictly speaking two parts. The first part ([F] = {F}) says that all languages use the same features, namely the set provided by the UG; see (2b). The

[2] An example of such an alternative is Hegarty (2005: 29ff). Hegarty builds on Giorgi & Pianesi (1996) and proposes that features are assembled into syntactic atoms for each derivation (numeration), rather than once and for all, as in Chomsky's work.

second part (LEX = [F]) says that LEX contains only single features rather than sets/bundles (assemblies in Chomsky's terms); see (2c).

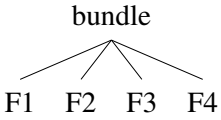
(2) The atoms of Merge in Nanosyntax

a. UG provides the set {F} of features (properties) available to language
b. The set of features used by individual languages [F] is identical to {F}
c. The atoms of Merge in individual languages (LEX) are individual features, members of [F]

The consequence of the claims in (2) is that Nanosyntax has a different starting point compared to other theories. In virtually any framework, the input to syntax is a language-particular list, the presyntactic lexicon. In Nanosyntax, there is no language-particular presyntactic list: all languages start from the same features. As a consequence, Nanosyntax also has a different take on the variation among languages. Since they cannot reside in the presyntactic lexicon, they must reside in the postsyntactic lexicon, and this requires a rather different architecture of grammar compared to the standard view. I shall be exploring this architecture in the current chapter.

Let me start by providing some reasons for the ideas in (2), starting from the last statement (i.e., LEX = [F]). According to Starke (2014a), the main reason why syntax should not start from bundles is that such bundles are equivalent to "[e]nclosing elements inside square brackets." This is in turn "a notational variant of linking those elements under a single mother node. Feature bundles are thus trees, typically flat n-ary trees with n > 2. This means that a syntactic representation with 'feature bundles' in its terminals is composed of two types of trees, each with their own conventions: the binary branching syntactic nodes, and the n-ary branching lexical nodes at the bottom. [...] In other words, we just invented a second syntax and a new type of merge, for the purpose of lexical storage." An example of a feature bundle that Starke talks about is in (3).

(3) *Feature bundle = flat* n-*ary tree*



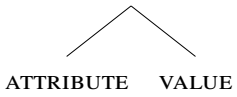
In abandoning feature bundles, Nanosyntax comes close to various other frameworks, often related in spirit. For instance, Kayne (2005) (cf. Collins & Kayne 2021) has proposed that "UG imposes a maximum of one interpretable features per lexical item." Also in Cartography (Cinque & Rizzi 2010), the maxim "one (morphosyntactic) property – one feature – one head" has been adopted as a research guideline.

It is worth pointing out that as a result of insisting on the atomic nature of features, Nanosyntax only uses privative features. These are features like PLURAL or PARTICIPANT. They have

no internal structure and no values: they are either present or absent. When they are present in the structure, their grammatical meaning is included in the interpretation. When they are absent, their meaning is not included.

Binary features like [+/-PLURAL] or multivalent features [NUMBER:PL] are not used in Nanosyntax. The reason is that both of these feature types are internally complex objects, decomposable into an attribute and a value. The attribute and the value are "enclosed in square brackets," i.e., we get an object like [ATTRIBUTE:VALUE]. Rather than enclosing the attribute and the value in brackets, we could also represent this object as in (4), which makes its composite nature clear.

(4) *Attribute-value pair as a complex object*

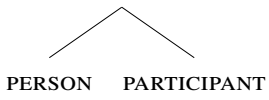


We already know that Nanosyntax (as one of its architectural properties) avoids postulating complex presyntactic objects like (4). Therefore, the general approach to objects such as (4) followed in Nanosyntax is to understand the value and the attribute as syntactic atoms, and understand attribute value pairs (where needed) as complex objects created by Merge.

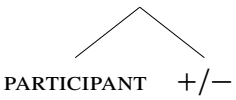
For concreteness, let me provide an example. Consider, for instance, two common representations of the PARTICIPANT feature (which is a feature characteristic for the 1st and 2nd person). In multivalent theories, this feature is usually rendered as [PERSON:PARTICIPANT], which is equivalent to the structure (5a). In a theory with binary features, one would use [+/−PARTICIPANT], which is equivalent to (5b).

(5) *Multivalent and binary PARTICIPANT feature*

a.



b.



When it comes to multivalent features like (5a), their reinterpretation into privative features is almost trivial. Specifically, where objects such as (5a) are needed, Nanosyntax analyses them as the combination of two atomic features (PERSON and PARTICIPANT), a strategy followed, e.g., in Vanden Wyngaerd (2018). What he proposes is that (5a) is literally constructed by syntax, merging an atomic PERSON feature with an atomic PARTICIPANT feature, producing a complex syntactic structure [PARTICIPANT PERSON]. This structure is equivalent to using a presyntactic "atom" like (5a), and that is precisely the point. In sum, multivalent features are equivalent to structures created by Merge, and they are therefore treated as such in Nanosyntax.[3]

[3]In Vanden Wyngaerd's proposal, the first person is then created by further merging the atomic SPEAKER feature, producing a standard syntactic hierarchy of the type [SPEAKER [PARTICIPANT PERSON]], which we shall discuss in greater detail later on. However, it is also possible

Similar considerations apply to binary features, even though here the issues are admittedly a bit more complex. As pointed out in Harbour (2011), binary features generally allow for a three-way distinction between the absence of a feature Ø, its positive value [+F] and its negative value [−F]. An interesting hint as to how such a contrast can be restated in privative terms is related to Harbour's (2011:562) observation that the interpretation of [−F] is derived compositionally from [+F] by applying negation to it, i.e., according to Harbour, $[\![-F]\!] = \neg[\![+F]\!]$. If that is so, it seems possible to encode the three way contrast that Harbour talks about as an opposition between the absence of a feature Ø, its presence [F] and a two-feature combination of F and a regular negation feature Neg, yielding [Neg F]. While it would be interesting to look at the potential differences (if any) between the [− F] and the [Neg F] notations, this is beyond the scope of the current chapter.

In sum, the requirement of atomicity precludes the Nanosyntactic theory from using multivalent and binary features as syntactic atoms, even though objects corresponding to such features can be, where needed, understood as complex structures produced by Merge.

Let me now leave the atomic nature of the elements in LEX behind and let me turn to the second idea in (2), which is that the language-specific selection of features [F] is the same set as the set of features provided by UG {F}, i.e., that [F] = {F}. This idea has been probably most systematically argued for in the Cartography framework. Cinque & Rizzi (2010: 55) state it as a general methodological guideline that "if some language provides evidence for the existence of a particular functional head (and projection), then that head (and projection) must be present in every other language, whether the language offers overt evidence for it or not." I shall return to this idea in Section 1.5.

I close this section by briefly repeating the main message, which is that in Minimalism, the nature of syntactic atoms (LEX) becomes central. In Chomsky's own work, few restrictions are associated with syntactic atoms: they correspond to language-specific collections of grammatical features used by individual languages. Nanosyntax, on the other hand, places the most severe restrictions on LEX; specifically, as one of its core hypotheses, it makes LEX (the list of syntactic atoms used by particular languages) non-distinct from {F} (the set of features provided by UG). Since these sets are non-distinct, the distinction among LEX, [F] and {F} can be eliminated and replaced by just a single set, namely the set of universal features. These features have no internal structure accessible to syntax, i.e., they are non-decomposable privative features.

This view leads to a theory without any language-particular presyntactic lexicon. In other words, not only are the operations of narrow syntax identical across languages, the list of syntactic atoms is also identical for all languages as well (cf. Starke 2014b).

to imagine a system where 1st person is created by merging the SPEAKER feature directly as the value of PERSON.

1.3 Late Insertion

The question that immediately arises in this setup concerns language variation. If all languages have the same syntactic atoms, and if the rules of their combination are also identical (as is standard in Minimalism), then how can it be that languages differ? It turns out that this is possible because of the fact that Nanosyntax subscribes to Late Insertion. In Late-Insertion theories, syntax operates over features that lack any phonology or concepts. Phonological and conceptual information is only activated ('inserted') after syntax, during the so-called 'spellout.' And this is also where cross-linguistic differences arise: late, but still before the PF. This model is depicted in Figure 1.1.

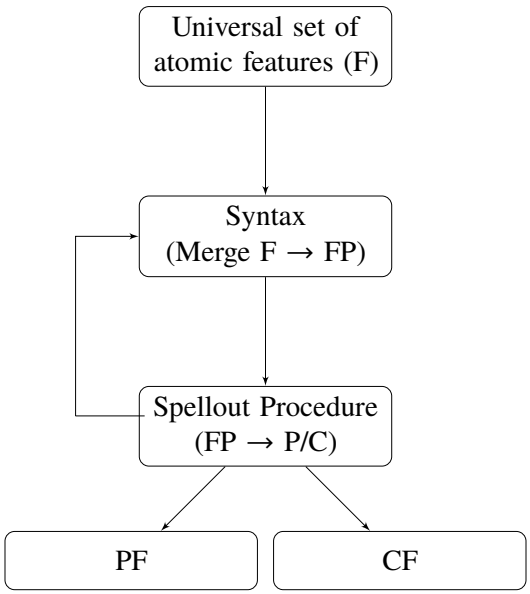


Figure 1.1: Nanosyntax model of grammar

We can see here that the model of grammar starts from single features. These are fed into syntax. Syntax assembles these features into syntactic phrases (FPs). FPs produced by syntax are then fed into the lexicon and mapped onto phonological form (PF) and conceptual form (CF) by the so-called spellout procedure. In Nanosyntax, this is a (language-invariant) procedure that searches the postsyntactic lexicon for lexical items matching the syntactic configurations provided by syntax. The postsyntactic lexicon is represented in the diagram by the formula FP → P/C, since in Nanosyntax, it links syntactic constituents (FPs) to phonology (P) and/or concepts (C).

As we shall see in the following sections, the spellout procedure interacts with the postsyntactic lexicon and it can trigger language variation in a number of ways. The most straightforward way corresponds to the simple fact that, for instance, the plural is realized as *-s* in English and *-er* in Norwegian. However, as we will see, the role of the lexicon goes also beyond such simple

facts. For instance, the Spellout Procedure may be unable to externalize certain structures because they do not find a matching item in the lexicon. Such structures will then be fed back to syntax for adjustments (Last-Resort movements). This is the meaning of the 'feedback-loop' arrow leading from Spellout back to Syntax. Even without knowing the details of how exactly the spellout procedure and the postsyntactic lexicon operate, it is easy to see that having a feedback loop of this sort is something that actually allows for the position described in the previous section, which is that variation only resides within the Lexicon (which is a part of the Spellout box). Since the lexicons are different for different languages, the very same configuration may be externalized in one language but fed back to syntax for adjustments in another language. This is how variation arises even when the syntactic atoms and the rules for their combination are the same.

Apart from allowing for language-invariant syntactic atoms, the model in Figure 1.1 also allows for a modular view on syntax. In order to see how this is relevant, it is instructive to compare the model in Figure 1.1 with an Early-Insertion model. In Early-Insertion models, the syntactic computation operates over lexical items that contain also phonology and/or concepts (i.e., non-syntactic information). To give a concrete example, in Chomsky's (1995) approach, "[t]he lexical entry for *airplane*, for example, contains three collections of features: phonological features such as [begins with vowel], semantic features such as [artifact], and formal features such as [nominal]. The phonological features are stripped away by Spell-Out and are thus available only to the phonological component; the others are left behind by Spell-Out, and the formal ones may continue to be accessed by the covert computation to LF."

The passage makes it clear that syntactic atoms in such a model contain also phonological and conceptual information. Now since the syntactic derivation builds on such lexical items, it follows that minimally at its early stages, the syntactic derivation also contains phonological and conceptual information. This is depicted in Figure 1.2, where a language-specific presyntactic lexicon feeds the syntactic derivation, and the syntax box therefore contains all three kinds of features (F, P, C).

With this in mind, consider now the observation that syntactic operations are only driven by syntactic features and never by phonological features (Zwicky 1969; Zwicky & Pullum 1986; Marantz 1996; Miller, Pullum & Zwicky 1997). For example, across languages, there are classes of verbs with special behavior depending on grammatical features such as modality, aspect, voice, etc. However, there are no special classes of verbs depending on features such [begins with vowel], etc. The literature cited above has summarised such effects under the label of *Phonology-Free Syntax*, see (6).

(6) *Principle of Phonology-Free Syntax*
Rules of syntax make no reference to phonology.

A related observation (Marantz 1994) is that concepts also do not influence the operations of

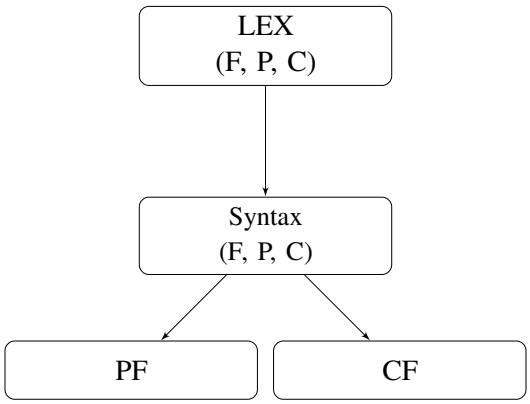


Figure 1.2: An early-insertion model of grammar

syntax. For example, languages display differential object marking depending on the animacy and/or specificity of the direct object, but they do not differentially mark objects that correspond to an [artifact].

(7) *Principle of Concept-Free Syntax*
Rules of syntax make no reference to concepts.

In sum, the observation is that neither conceptual or phonological features influence the working of the syntactic computation, an observation that is a part of a larger hypothesis referred to as modularity (Fodor 1983).

These observations naturally follow in Late Insertion models, recall Figure 1.1. We can see that in such a model, syntax starts from single features (Fs) and assembles them into syntactic trees. Such trees are then the input to the lexicon, which links such representations to their corresponding representations at PF and CF. Thus, instead of "stripping" the narrow syntactic derivation of phonological and conceptual information, spellout (the lexicalisation procedure) *introduces* both phonology and concepts (by activating the relevant PF/CF representations). We shall look at this process in more detail in the next section; for now, the point is that in such a model, the principles of phonology/concept-free syntax (recall (6) and (7)) directly follow from the architecture.

On the other hand, these effects do not follow from the architecture in the classical Early-Insertion model, recall Figure 1.2. We can see that here, the syntactic computation begins with traditional lexical items that contain not only syntactic information, but also phonological and conceptual information. Clearly, in such a model, something extra needs to be said as to why syntax can make reference to only one type of information that is present in the atoms, but not to the other two types. And while some answers could clearly be given, the point is simply that neither of the principles (6) or (7) is *predicted* on the basis of such an architecture, and an independent explanation must be provided *post hoc*.

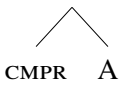
The architectural conclusion that Nanosyntax draws from this is that a model that proposes Late Insertion of both phonology and concepts has the right type of architecture from which these observations naturally follow. Moreover, once the lexicon is placed after syntax for these independent reasons, it becomes possible to explore the option that the postsyntactic lexicon is, in fact, the *only* component of grammar that is language specific. The following sections visit a couple of relevant examples showing how this can be achieved.

1.4 The Postsyntactic Lexicon in Nanosyntax

In order to serve the purpose of mapping syntax to sound and conceptual meaning, the lexicon is a storage place for memorised links between syntactic structures on the one hand and sound and/or concept on the other hand. The basic idea is that when a syntactic structure arrives at the interface, the spellout procedure tries to match this structure against the stored information in the lexicon, thereby mapping the syntactic structure onto the corresponding sound and meaning. If the procedure succeeds to match the structure against the stored information, we can say that the derivation converges. If matching fails, the derivation crashes (there is no way to map such a derivation to sound/meaning).

As an example of a lexical item, consider, for instance, the suppletive comparative *worse*. The idea is that when a child hears *worse*, the child will remember it and store it in the form of a lexical entry like (8). The lexical entry is a link between a particular syntactic structure (the comparative of an adjective) and a particular phonology. The lexical entry will then be used as a "translation" instruction: when syntax builds the structure as in (8), it will be realised as *worse* (see Caha, De Clercq & Vanden Wyngaerd 2019 for a discussion of root suppletion).

(8) $\text{CMPR}P \Leftrightarrow$ /wɜːs/



Constructing lexical items as links between syntactic structures and their phonological/conceptual representation leads to a particular consequence. The consequence is that the lexicon only contains well-formed syntactic structures: this is because only such structures are produced by syntax and can therefore be remembered as somehow special (i.e., associated to a non-compositional form or meaning).

The general conclusion we can draw from this is that the format of lexically-stored trees is restricted: the lexicon only contains well-formed syntactic trees (respecting binary branching, the universal hierarchy of projections, etc.). This is an interesting conclusion, because it contrasts with the standard view that language-specific lexicons are formed in an essentially unprincipled manner as haphazard collections of syntactic features. In the Nanosyntax model, these collections of syntactic features are not grouped into lexical items inside the lexicon. Rather, it is

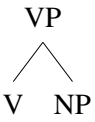
syntax who forms the collections (i.e., syntactic constituents), and the lexical items only link independently existing constituents to phonology and/or meaning. As in most accounts, the most important reason for storage is non-compositionality: the reason why we must remember *worse* is that it is non-compositional. On the other hand, we do not need to remember *long-er* because it is compositional. (There is, of course, the logical possibility that also compositional forms may be stored.)

The fact that the format of lexical entries is restricted is important. Since the lexicon is considered to be the only source of variation in Nanosyntax, a constrained lexicon automatically entails a constrained theory of variation (Starke 2014b). Specifically, all cross-linguistic variation must be expressible as a variation in the size and shape of lexically stored trees (where size refers to the number of features/projections inside the entry, and shape refers to the specific structural configuration of these features).

Before we look into the details of lexical insertion, let me note that the post-syntactic nature of lexical insertion in Nanosyntax is an important feature that distinguishes between Nanosyntax and other models with phrasal/complex lexical entries, such as the Simpler Syntax (SS) model of Culicover & Jackendoff (2005). In this model, phrasal lexical entries are understood to be the atoms of syntax, and this leads to redundancies. To see that, consider the quote from Culicover & Jackendoff (2006: 416), where the authors describe their idea as follows:

"SS enables storage of [...] complex structures with associated meanings. [...] Once pieces of syntactic structure can be stored in the lexicon associated with meanings, it is a simple step to store pieces of syntactic structure that have no inherent meaning [...] such as [(9)].

(9)



This piece of structure is equivalent to a traditional phrase structure rule VP → V–NP. Thus, it is possible to think of the lexicon as containing all the rules that permit syntactic combinatoriality. These are put to use directly in processing, as pieces available for constructing trees."

From this quote, we can see that while the possibility to store phrases is shared between Nanosyntax and the Simpler-Syntax model, there is a clear difference here. In Nanosyntax, it is impossible to conceive of the lexicon as containing rules that "permit syntactic combinatoriality." On the contrary, syntax operates according to its own rules and principles, merging one feature at a time. There is no way how a post-syntactic lexicon could *provide* a ready-made syntactic structure for direct use because the only thing that the Nanosyntactic lexicon does is that it links the outputs of syntax to their phonological and/or conceptual representation. The lexicon in Nanosyntax thus remains a passive list, consulted only during the mapping from syntax to PF/CF.

As the last point in this section, let me mention that the matching between lexicon and syntax

is based on identity. A particular lexical entry only matches a given structure if it contains a piece that is identical to this structure. This is the content of the insertion principle in (10), which is standardly referred to as the Superset Principle.

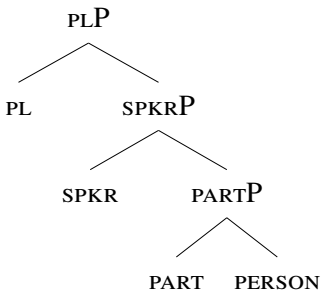
(10) The Superset Principle (Starke 2009)
A lexically stored tree matches a syntactic node iff the lexically stored tree contains the syntactic node.

1.5 Syncretism as an alternative to language-particular features

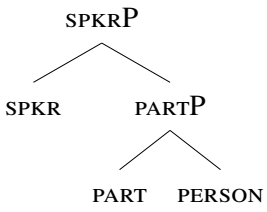
In this section, I return to Chomsky's idea that each language may only use a subset of the features provided by UG, recall (1b). My goal is to show how Nanosyntax treats the relevant cases by relying on the postsyntactic lexicon only (keeping the feature structures constant across languages).

In order to work with a specific example, I focus on personal pronouns like *I, you, we*, etc., drawing on Vanden Wyngaerd (2018). The first thing that we must put in place are the features that these pronouns have. Following Vanden Wyngaerd (2018) (cf. Harley & Ritter 2002), I shall be using here the features PERSON, PARTICIPANT and SPEAKER.[4] In addition, I will be using the privative feature PL. When all these features are present in the structure, as in (11), we get the first person plural structure. When the PL feature is missing, we get the first person singular, see (12).

(11)



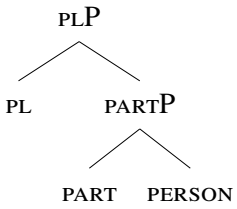
(12)



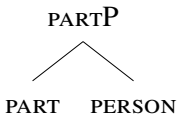
(13) gives the second person plural, (14) corresponds to the second person singular.

[4] Vanden Wyngaerd (2018) calls these features 3, 2 and 1, but this is just a matter of labelling conventions.

(13)



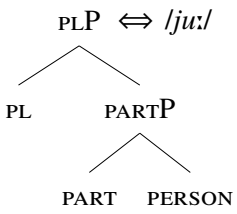
(14)



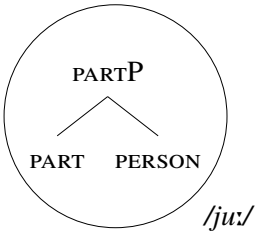
Note that the interpretation of these structures has a 'Gricean' component, in that the structure in (14) only says that we are looking at a participant in the discourse (which could be either the speaker or the addressee). However, since syntax has a special feature for the speaker, and since the feature is not used in (14), the structure is interpreted as referring to the addressee. Similarly, even though the structure (14) is unspecified for number, it is interpreted as singular, since the plural feature is absent.[5]

Now, when a child encounters the expression *you* in the function of the 2nd person plural pronoun, she will associate the structure of the 2nd person plural with the relevant sound, and she will store this association in the lexicon as in (15).

(15)



(16)



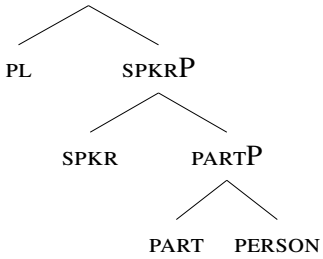
Suppose now that syntax builds a structure like (16). At spellout, the phrase must be linked to a PF representation. The lexicon is therefore searched with the goal to find a structure that is identical to this constituent. Since this constituent is found inside the lexical item (15), the structure can be linked to the phonology associated with the lexical entry. This is the content of the Superset Principle, recall (10).

In (16), I depict by a circle the fact that this structure can be lexicalised by (15), which associates this structure to */juː/*. As a result, syncretism between the second person plural and the second person singular arises.

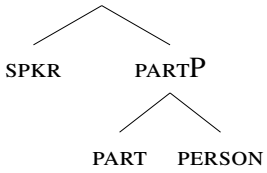
In cases where there is no syncretism, like in the first person, the lexicon must contain two lexical entries as in (17) and (18).

[5] There are also proposals according to which the plural is the number-neutral form, and the singular is semantically marked Sauerland, Anderssen & Yatsushiro (2005). I do not try to resolve this tension here and follow Vanden Wyngaerd's (2018) approach, where the singular is unmarked.

(17) PLP ⟺ *wi:*



(18) SPKRP ⟺ ʌI



Notice that both entries match the first person singular, because both entries contain its structure. If there are two candidates for spelling out a particular structure, competition arises. In this competition, /ʌI/ wins, because it is a better match. (Competition among multiple matching entries, resolved by 'best fit' is a standard part of Late-Insertion theories.)

This mechanism allows for an elegant and restrictive account of syncretism, as argued for pronouns in Vanden Wyngaerd's (2018) article, and as further demonstrated in various strands of research within Nanosyntax (Caha 2009; 2013; 2017; 2021; Pantcheva 2010; De Clercq 2013; Lander & Haegeman 2016; Taraldsen 2017; Baunaz & Lander 2018a;b; Phan & Duffield 2019; Taraldsen Medová & Wiland 2019).

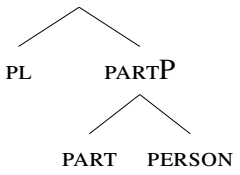
For the present chapter, the main interest of looking at syncretism is to show how we can use it to model variation. One aspect of this variation is trivial. Consider, for instance, the following dataset from Dakar Wolof (from Vanden Wyngaerd 2018).

(19) Dakar Wolof pronouns

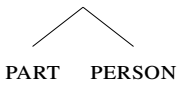
	SG	PL
1	man	ñum
2	yow	yeen
3	moon	ñoom

The difference from English is that there is no syncretism in the second person between the singular and the plural. This is because a child growing up in a Wolof-speaking environment will have enough evidence to postulate (in addition to the 2nd person plural entry) an independent entry for the singular, constructing a pair of entries as in (20) and (21).

(20) PLP ⟺ */yeen/*



(21) PARTP ⟺ *yow*



The lexical entry (20) could in principle also pronounce the second person singular. However, since there is a better-fitting entry (namely (21)), this better-fitting entry is used. As a result, Wolof has no syncretism between the second person singular and plural.

While this type of variation appears trivial, interesting results emerge when we push it to the extreme. Suppose, for instance, that a language would only have pronouns like the English *you*, i.e., lacking a singular-specific counterpart in the lexicon. I.e., in all persons, we would get the singular-plural syncretism because there would never be any better-fitting competitior.

A language like that is Salt-Yui, where all independent pronouns are ambiguous between the singular and plural, see (22). (The third person uses demonstratives, which are also identical across the two numbers.)

(22) Salt-Yui (Cysouw 2009: 116)

	SG	PL
1	na	na
2	ni	ni
3	DEM	DEM

Such a language-wide syncretism is sometimes referred to as 'absolute' syncretism or 'meta-syncretism' (Calabrese 2008; Harley 2008).[6] One way to analyse such a language is to say that the language lacks the relevant feature (plural in the case of (22)), since the language does not show any overt evidence for it. The idea is that since the child has no evidence for that feature, the feature will not be selected into the set [F] of features relevant for that particular language (where, recall, [F] is a subset of the features made available by UG). In other words, we can capture this by varying the inventory of features.

Nanosyntax, however, prefers not to go down this path (see, e.g., the discussion in Caha 2009: 109ff). Rather, it accounts for paradigms such as (22) by pushing the notion of syncretism to its extreme. Under this approach, Salt-Yui does have a PL feature, and the pronouns in the right column of (22) spell it out. The absence of singular-specific forms in the singular column is analysed simply as an instance of syncretism: each form in (22) is syncretic between singular and plural in the same way as *you*. Under this approach, the paradigm in (22) represents just one (expected) logical option among many others as to how language-specific lexicons may reflect a universal set of features. This, then, is one concrete example how the postsyntactic lexicon allows us to capture cross-linguistic variation without proposing different feature inventories.

[6] Salt-Yui happens to have other means of distinguishing singular and plural reference. I am not reflecting on this in any detail, since my point is going to be independent of this.

1.6 Tree size as an alternative to bundling

Let me now turn to the issue of presyntactic bundles proposed in standard minimalism as a way to handle certain aspects of cross-linguistic variation. The point of this section is to show how Nanosyntax replaces presyntactic bundling (which is unavailable in this theory) by the idea that lexical trees vary in their size.

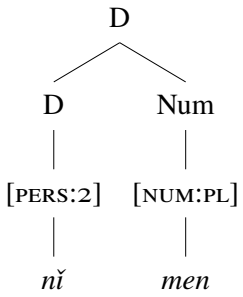
To have a concrete example in hand, consider the Mandarin data in (23) (as discussed in Vanden Wyngaerd 2018).

(23) Mandarin pronouns

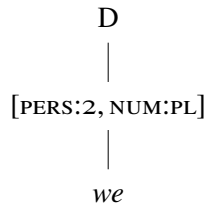
	SG	PL
1	**wǒ**	**wǒ**-men
2	**nǐ**	**nǐ**-men
3	**tā**	**tā**-men

There is an obvious difference between the paradigms we have seen so far and Mandarin. Specifically, the Mandarin plural has two morphemes, one expressing person and another number (plural). On the other hand, English and Dakar Wolof have just one morpheme in the plural, expressing both person and number. One could conclude here that Mandarin (24) has two syntactic heads (and two positions of exponence), while English (25) has just one head:

(24)



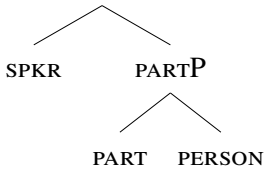
(25)



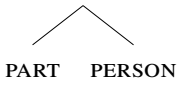
In standard Minimalism, the differing structures would be a consequence of different groupings of features in LEX. A classical example of such work within the minimalist program is the paper by Bobaljik & Thráinsson (1998).

In Nanosyntax, the contrast between English and Mandarin can be captured by proposing that Mandarin person markers are lexically 'small.' Specifically, if no pronominal person marker in Mandarin spells out the plural feature in addition to person features, a paradigm like (25) emerges. In (26) and (27), I show the lexical entries for the first and second person markers respectively. Note that none of them contains the plural feature. This is unlike the English *you* in (15) and the Wolof *yeen* in (20).)

(26) SPKRP ⟺ / *wǒ* /



(27) PARTP ⟺ /*nǐ*/



The plural in Mandarin is expressed by a separate lexical entry that Vanden Wyngaerd (2018) depicts as in (28).

(28) PLP ⟺ /*men*/

When embedded within the general theory of spellout assumed in Nanosyntax (due to Starke (2018)), the postsyntactic lexical entries as given above are all that one needs to account for the difference between English/Wolof and Mandarin. In order to show how this works in detail, we must look now at the details of the Nanosyntax spellout procedure.

As I will be introducing this procedure, it should be kept in mind that the spellout procedure is language invariant. However, as an integral part of its operation, the procedure interacts with the postsyntactic (language-specific) lexicon. As a result, it leads to different outputs in different languages, despite the fact that (i) the atoms of syntax are the same across languages; (ii) the operations of narrow syntax are constrained by the same principles across languages and (iii) the spellout procedure itself is also language-invariant.

The first idea that we need to put in place is that spellout is cyclic, applying potentially many times during a single derivation (cf. Uriagereka 1999). In Nanosyntax, spellout in fact happens after every step of external Merge. More specifically, every time external Merge applies – merging a new feature F and forming an FP – the FP must be lexicalised, else the derivation crashes. 'Be lexicalised' in this context does not mean directly 'be pronounced;' it means that a matching item for the FP created by external merge must be found.

If the lexicon finds a matching item for the FP, this means that the derivation can be mapped onto a PF/CF representation (it can be externalised). From there, the derivation may follow one of two routes. It either terminates, in which case the phonology and concepts are sent to PF and CF, following the downward arrows leading from the Spellout box in Figure 1.1. Alternatively, the derivation continues by further Merge (with its pronunciation delayed until it terminates). In this case, the structure (which had converged at the interface) is fed back to syntax via the cyclic feedback loop that leads from the Spellout box back to Syntax, see Figure 1.1.

Consider now what happens if matching fails. This means that the derivation cannot be externalised and it crashes at the interface. It is therefore returned to syntax where it must be

rescued. Rescue in this context means that syntax performs various types of movement in order to change the configuration in the hope that the lexicalisation of FP is going to succeed. The precise series of rescue steps is given in (29). Keep in mind that 'spell out FP' in the definitions in (29) means 'match FP by a lexical item.'[7]

(29) Spellout Algorithm (based on Starke 2018)

a. Merge F and spell out FP
b. If (a) fails, try moving the Spec of F's complement and spell out FP
c. If (b) fails, move the complement of F and spell out FP

It is important to keep in mind that the movements in (29) are not regular feature-driven movements. Their motivation is not to create a new interpretation (e.g., different scope); the goal is to create a new spellout configuration. Because of their motivation, the movements triggered by (29) are called spellout-driven movements, and they are expected to have different properties from feature-driven movements. For feature-driven movement in Nanosyntax, see De Clercq (2019).

It is also worth noting that the movements are performed by syntax, and not by PF. The idea is that when the derivation crashes, the lexicalisation procedure in (29) sends the derivation back to syntax, and it is syntax who has to perform the movement. This is again a part of the cyclic feedback loop in Figure 1.1.

In order to see in detail why spellout-driven movement is a syntactic movement (rather than a postsyntactic movement), it may be instructive to compare spellout movements to features like the EPP in standard minimalism. The movement-triggering EPP feature is standardly associated to particular elements of LEX *before syntax*, but this does not mean that the EPP triggers "presyntactic" movement. Rather, the conclusion is that while the EPP is a presyntactic trigger, it is syntax who performs the movement and satisfies the EPP.

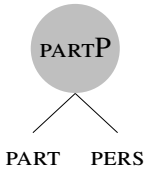
In the case of the spellout algorithm (29), the situation is similar. The spellout algorithm serves as the postsyntactic trigger for movement, but the movement itself is performed by syntax. Specifically, the movement takes place after the derivation is shipped into the Syntax box in Figure 1.1 using the feedback loop.[8]

With this issue clarified, let me now illustrate the working of the algorithm on the example of the Mandarin, Wolof and English second person plural pronouns. In all of these languages, the derivation begins by merging PERSON and PARTICIPANT, yielding (30).

[7] The algorithm is due to Starke (2018). I have changed the wording slightly to (hopefully) facilitate understanding.

[8] It should be noted that comparing spellout-driven movements to EPP-driven movements does not mean that Nanosyntax relies on EPP features to effect such movements. Rather, Starke's (2014b) paper suggests that spellout movements may in fact serve as a potential replacement for EPP-type of movements, even though it remains to be seen whether this is possible to achieve in the full range of relevant cases.

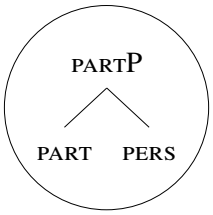
(30)



Immediately after PARTP is formed, it must be spelled out. This means that the highlighted node must be matched against a lexical entry that contains the exact same node. This is the content of (29a).

In all three languages, a matching item is found, and spellout succeeds. For English, the relevant entry is *you* in (15); for Wolof, see the perfectly matching entry (21); and finally for Mandarin, see (again) the perfectly matching (27). The result is that in all of these languages, the structure (30) is spelled out following the 'direct spellout' clause of the algorithm in (29a). Therefore, the only difference among the languages is of the trivial type, such that different languages have different phonology associated to this structure.

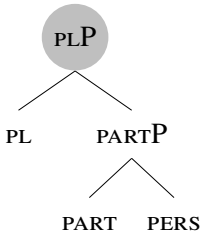
(31)



ENG: *you*
WOL: *yow*
MAN: *nǐ*

Since the PARTP node found a match in the lexicon, the derivation converges. At this point, the derivation may either terminate or continue by further Merge. If it terminates, it would be pronounced as indicated in (31). However, if more features are to be added, the derivation is not pronounced as yet, but sent back to Syntax using the feedback loop. Suppose the feature PL is merged on top of (31), producing (32). Once again, after external Merge takes place, spellout takes place, and the node created by external Merge must be matched against a lexical entry. The relevant node is highlighted in (32).

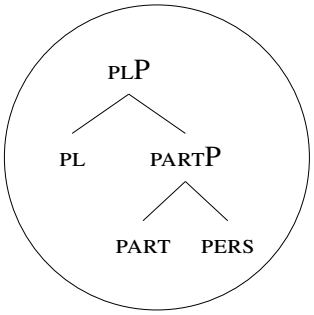
(32)



At this point, the three languages part ways. English uses the same item as before to spell out this structure, yielding syncretism. Wolof now uses the rule (20) instead of the original winner (21). Despite this difference (syncretism in English, no syncretism in Wolof), the languages pattern

alike in that they have one marker for all three features, see (33).[9]

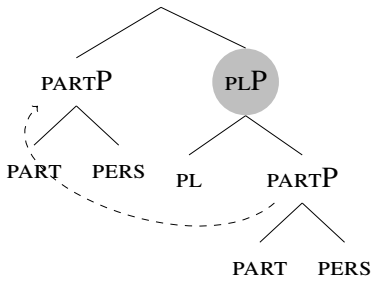
(33)



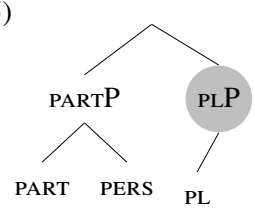
ENG: *you*
WOL: *yeen*
MAN: —

However, Mandarin has no matching item. Therefore, the structure cannot be externalised and it is fed back to syntax for repair, with the hierarchy of repair strategies defined by the spellout algorithm. In the algorithm (29), the first type of rescue movement is the so-called Spec-movement, see (29b). However, there is no specifier in (32), and this option therefore does not lead to any change. As a result, the repair strategy (29c) is activated in Mandarin. The repair movement is depicted in (34), and the resulting structure, input top lexicalisation, is in (35). The PLP node we need to spell out is highlighted throughout. It is the same node as in (32).

(34)



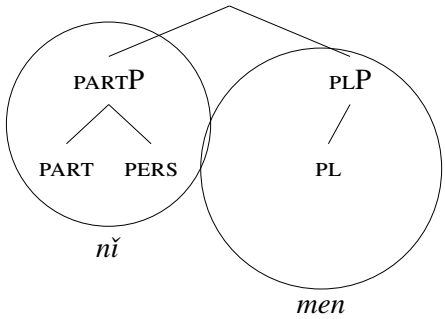
(35)



Note that in (35), there is no trace of the moved constituent. This is in accordance with Starke (2018), who assumes that spellout movements either do not leave a trace, or that the trace is ignored by matching. Regardless of which of these options is correct, the PLP node in (35) is matched by the plural marker *men*, recall (28). Therefore, matching is successful, and the relevant markers spell out the nodes circled in (36). This tree correctly captures the agglutinative structure of the second person plural in Mandarin, including the linear order.

[9]The previous matches at the level of PARTP are lost at this point, only the topmost match survives. This is called 'Cyclic Override' in Nanosyntax. Cyclic override is the consequence of the spellout algorithm (29), which requires that the topmost node is spelled out.

(36)



For current work in Nanosyntax that relies and elaborates on the spellout algorithm, see Baunaz & Lander (2018a), Bergsma (2019), Blix (2021), Caha (2021), Caha (to appear), Caha, De Clercq & Vanden Wyngaerd (2019), De Clercq (2019), De Clercq (2020), De Clercq & Vanden Wyngaerd (2017), De Clercq & Vanden Wyngaerd (2018), De Clercq & Vanden Wyngaerd (2019), Kloudová (2020), Taraldsen (2019), Taraldsen, Medová & Langa (2018), Türk (2020), Vanden Wyngaerd et al. (2020), Wągiel & Caha (2020), Wiland (2018), Wiland (2019), Ziková (2018).

For reasons of space, it is impossible to illustrate here all the various derivational options that such an algorithm offers, and I am also leaving some derivational options out of the discussion here (namely Backtracking and Spec-formation, for which see the works cited above). The point of discussing Mandarin was rather to show that it is possible to start from language-invariant atoms, combine these atoms in a language-invariant narrow syntax based on binary Merge, and still end up with different structures. Specifically, what we have seen is that Mandarin second person plural pronoun has the structure (36), while English and Wolof have the structure in (33).

Crucially, these difference do not come about as a result of language particular spellout rules: the spellout procedure is the same for Wolof, English and Mandarin, recall (29). The only thing that differs are the lexical items. But since the spellout procedure crucially relies on the lexical entries for matching, the lexical items apparently control how the derivation unfolds. Due to their ability to do this, the lexical items become the triggers of structural parametric differences.

1.7 Conclusions

The idea that lexical items are the loci of parametric variation has been independently known in the minimalist literature as the so-called Borer-Chomsky Conjecture. Baker (2008: 353) states it as follows:

(37) *The Borer-Chomsky conjecture*
All parameters of variation are attributable to differences in the features of particular items (e.g., the functional heads) in the lexicon.

While attractive on its own, an issue related to the Borer-Chomsky conjecture is that it apparently clashes with the similarly attractive idea of Late Insertion, i.e., the idea that the insertion of phonology and conceptual information happens late (recall Section 1.3). The reason for the clash is the fact Late-Insertion entails a postsyntactic lexicon, but such a lexicon seems to come too late to be able to influence how syntax operates. We are thus left in a paradoxical situation where one set of ideas leads us to propose a postsyntactic (language-particular) lexicon, while another set of ideas leads us to place the (language-particular) lexicon before syntax.

As a result, some Late-Insertion models such as Distributed Morphology actually rely on 'two lexicons' in the sense of two different language-particular lists: DM has both a set of post-syntactic Vocabulary Items that supply phonology and concepts, and it also has a language-particular presyntactic LEX with language-particular feature bundles. This allows such models to implement both modularity and the Borer-Chomsky conjecture, but it comes at the cost of an apparent doubling of the lexicons. Proposing two lexicons is clearly a way out of the conundrum, yet it seems to institutionalise the paradox rather than resolve it.

In the context of these considerations, the interest of the Nanosyntactic cyclic spellout system as described above is that it makes the Borer-Chomsky conjecture compatible both with Late-Insertion – and with a single (postsyntactic) lexicon. Moreover, the Nanosyntactic lexicon is constrained in a way that most lexicons are not, namely, it only contains well-formed syntactic structures (recall section 1.4). These lexical items interact with the spellout procedure (described in Section 1.6) in a way that different syntactic structures arise in different languages.

As such, the system comes rather close to implementing the Borer-Chomsky conjecture in a way originally envisioned by Borer (1984: 2-3): "It is a desirable step forward to try and restrict the class of possible parameters. The strongest claim in this respect would be that there are no language-particular choices with respect to the realization of universal processes and principles. Rather, interlanguage variation would be restricted to the idiosyncratic properties of lexical items. These idiosyncracies, which are clearly learned, would then interact with general principles of UG in a particular way. This interaction would result in vastly different systems."

References

Baker, Mark C. 2008. The macroparameter in a microparametric world. In Theresa Biberauer (ed.), *The limits of syntactic variation*, 351–373. Amsterdam: John Benjamins.

Baunaz, Lena & Eric Lander. 2018a. Deconstructing categories syncretic with the nominal complementizer. *Glossa: a journal of general linguistics* 3(1). 31.1–27.

Baunaz, Lena & Eric Lander. 2018b. Syncretisms with the nominal complementizer. *Studia Linguistica* 72(3). 537–570.

Bergsma, Fenna. 2019. Mismatches in free relatives–grafting nanosyntactic trees. *Glossa: a journal of general linguistics* 4(1). 119.1–37.

Blix, Hagen. 2021. Phrasal spellout and partial overwrite: on an alternative to backtracking. *Glossa: a journal of general linguistics* 6(1).

Bobaljik, Jonathan David & Höskuldur Thráinsson. 1998. Two heads aren't always better than one. *Syntax* 1(1). 37–71.

Borer, Hagit. 1984. *Parametric syntax*. Dordrecht: Foris.

Caha, Pavel. 2007. Case movement in PPs. In Monika Bašić, Marina Pantcheva, Minjeong Son & Peter Svenonius (eds.), *Nordlyd, special issue on space, motion, and result*, vol. 34 (Tromsø Working Papers on Language and Linguistics 34.2), 239–299. Tromsø: CASTL, University of Tromsø.

Caha, Pavel. 2009. *The nanosyntax of case*. CASTL, University of Tromsø dissertation. lingbuzz/000956.

Caha, Pavel. 2010. The parameters of case marking and spell-out driven movement. In Jeroen Van Craenenbroeck (ed.), *Linguistic variation yearbook*, 32–77. Amsterdam: John Benjamins.

Caha, Pavel. 2013. Explaining the structure of case paradigms by the mechanisms of nanosyntax. *Natural Language & Linguistic Theory* 31. 1015–1066.

Caha, Pavel. 2017. How (not) to derive a *ABA: The case of Blansitt's generalisation. *Glossa: a journal of general linguistics* 2(1). 84.

Caha, Pavel. 2021. Modeling declensions without declension features. The case of Russian. *Acta Linguistica Academica* 67. 385–425. https://doi.org/10.1556/2062.2021.00433.

Caha, Pavel. to appear. *The nanosyntax of case competition. a study of numeral phrases in Ossetic and Russian*. Language Science Press.

Caha, Pavel, Karen De Clercq & Guido Vanden Wyngaerd. 2019. The fine structure of the comparative. *Studia Linguistica* 73(3). Estimated authorship: 33%, 470–521. https://doi.org/10.1111/stul.12107.

Calabrese, Andrea. 2008. On absolute and contextual syncretism. In Asaf Bachrach & Andrew Nevins (eds.), *Inflectional identity*, 156–205. Oxford: Oxford University Press.

Chomsky, Noam. 1995. *The minimalist program*. Cambridge, Massachusetts: MIT Press.

Chomsky, Noam. 2004. Beyond explanatory adequacy. In Adriana Belletti (ed.), *Structures and beyond* (The cartography of syntactic structures 3), 104–131. Oxford: Oxford University Press.

Cinque, Guglielmo & Luigi Rizzi. 2010. The cartography of syntactic structures. In Bernd Heine & Heiko Narrog (eds.), *The Oxford handbook of linguistic analysis*, 51–65. Oxford: Oxford University Press.

Collins, Chris & Richard Kayne. 2021. Towards a theory of morphology as syntax. ms., NYU, lingbuzz/005693.

Culicover, Peter W & Ray Jackendoff. 2005. *Simpler syntax*. Oxford: Oxford University Press.

Culicover, Peter W & Ray Jackendoff. 2006. The simpler syntax hypothesis. *Trends in cognitive sciences* 10(9). 413–418.

Cysouw, Michael. 2009. *The paradigmatic structure of person marking*. New York: Oxford University Press.

De Clercq, Karen. 2013. *A unified syntax of negation*. Ghent: University of Ghent PhD dissertation.

De Clercq, Karen. 2019. French negation, the superset principle and feature conservation. In Miriam Bouzouita, Anne Breitbarth, Lieven Danckaert & Elisabeth Witzenhausen (eds.), *Cycles in language change*, 199–227. Oxford: Oxford University Press.

De Clercq, Karen. 2020. *The morphosyntax of negative markers. A nanosyntactic account*. Mouton de Gruyter.

De Clercq, Karen & Guido Vanden Wyngaerd. 2017. *ABA revisited: evidence from Czech and Latin degree morphology. *Glossa* 2(1). 69: 1-32.

De Clercq, Karen & Guido Vanden Wyngaerd. 2018. Unmerging analytic comparatives. *Jezikoslovlje* 19(3). 341–363.

De Clercq, Karen & Guido Vanden Wyngaerd. 2019. Negation and the functional sequence. *Natural Language & Linguistic Theory* 37(2). 425–460.

Fábregas, Antonio. 2007. An exhaustive lexicalisation account of directional complements. In Monika Bašić, Marina Pantcheva, Minjeong Son & Peter Svenonius (eds.), *Nordlyd, special issue on space, motion, and result* (Tromsø Working Papers on Language and Linguistics 34.2), 165–199. Tromsø: CASTL, University of Tromsø.

Fábregas, Antonio. 2009. An argument for phrasal spell-out: indefinites and interrogatives in Spanish. In Peter Svenonius, Gillian Ramchand, Michal Starke & Knut Tarald Taraldsen (eds.), *Nordlyd 36: special issue on Nanosyntax*, 129–168. Tromsø: CASTL.

Fodor, Jerry A. 1983. *The modularity of mind : an essay on faculty psychology*. Cambridge, Mass.: MIT Press. 145.

Giorgi, Alessandra & Fabio Pianesi. 1996. Verb movement in Italian and syncretic categories. *Probus* 8. 137–160.

Halle, Morris & Alec Marantz. 1993. Distributed Morphology and the pieces of inflection. In Ken Hale & Jay Keyser (eds.), *The view from building 20*, 111–176. Cambridge, MA: MIT Press.

Harbour, Daniel. 2011. Valence and atomic number. *Linguistic inquiry* 42(4). 561–594.

Harley, Heidi. 2008. When is a syncretism more than a syncretism? In Daniel Harbour, David Adger & Susana Béjar (eds.), *Phi theory*, 251–294. Oxford: Oxford University Press.

Harley, Heidi & Elizabeth Ritter. 2002. Person and number in pronouns: a feature-geometric analysis. *Language* 78(3). 482–526.

Hegarty, Michael. 2005. *A feature-based syntax of functional categories: The structure, acquisition, and specific impairment of functional systems*. Berlin, New York: Walter de Gruyter.

Kayne, Richard. 2005. *Movement and silence*. Oxford: Oxford University Press.

Kloudová, Veronika. 2020. *The interaction of functional morphemes inside the nominal phrase*. München: LINCOM GmbH.

Lander, Eric & Liliane Haegeman. 2016. The nanosyntax of spatial deixis. *Studia Linguistica*. 1–66.

Marantz, Alec. 1994. A late note on late insertion. In Young Sun Kim, Byung-Choon Lee, Kyoung-Jae Lee, Kyun-Kwon Yang & Jong-Kuri Yoon (eds.), *Explorations in generative grammar: a festschrift for Dong-Whee Yang*, 396–413. Seoul: Hankuk.

Marantz, Alec. 1996. Cat as a phrasal idiom: consequences of late insertion in Distributed Morphology. ms., MIT.

Miller, Philip, Geoffrey Pullum & Arnold Zwicky. 1997. The principle of phonology-free syntax: four apparent counterexamples in French. *Journal of Linguistics* 33. 67–90.

Pantcheva, Marina. 2009. Directional expressions cross-linguistically. Nanosyntax and lexicalization. In Peter Svenonius, Gillian Ramchand, Michal Starke & Knut Tarald Taraldsen (eds.), *Nordlyd 36: special issue on Nanosyntax*, 7–39. Tromsø: CASTL.

Pantcheva, Marina. 2010. The syntactic structure of locations, goals and sources. *Linguistics* 48(5). 1043–1081.

Pantcheva, Marina. 2011. *Decomposing path: The nanosyntax of directional expressions*. Tromsø: University of Tromsø dissertation.

Phan, Trang & Nigel Duffield. 2019. A more perfect unification: exploring a nano-syntactic solution to vietnamese đã. In Nigel Duffield, Trang Phan & Tue Trinh (eds.), *Interdisciplinary perspectives on vietnamese linguistics*, 69–80. Amsterdam: John Benjamins.

Sauerland, Uli, Jan Anderssen & Kazuko Yatsushiro. 2005. The plural is semantically unmarked. In Stephen Kepser & Marga Reis (eds.), *Linguistic evidence*, 413–434. De Gruyter Mouton.

Starke, Michal. 2009. Nanosyntax. A short primer to a new approach to language. In Peter Svenonius, Gillian Ramchand, Michal Starke & Tarald Taraldsen (eds.), *Nordlyd 36: special issue on Nanosyntax*, 1–6. Tromsø: University of Tromsø. lingbuzz/001230.

Starke, Michal. 2014a. Cleaning up the lexicon. *Linguistic Analysis* 39. 245–256.

Starke, Michal. 2014b. Towards elegant parameters: language variation reduces to the size of lexically-stored trees. In M. Carme Picallo (ed.), *Linguistic variation in the minimalist framework*, 140–152. Oxford: Oxford University Press.

Starke, Michal. 2018. Complex left branches, spellout, and prefixes. In Lena Baunaz, Karen De Clercq, Liliane Haegeman & Eric Lander (eds.), *Exploring nanosyntax*, 239–249. Oxford: Oxford University Press.

Taraldsen Medová, Lucie & Bartosz Wiland. 2019. Semelfactives are bigger than degree achievements. *Natural Language & Linguistic Theory* 37. 1463–1513.

Taraldsen, Knut Tarald. 2009. Lexicalizing number and gender in Lunigiana. In Peter Svenonius, Gillian Ramchand, Michal Starke & Knut Tarald Taraldsen (eds.), *Nordlyd 36: special issue on Nanosyntax*, 113–127. Tromsø: CASTL.

Taraldsen, Knut Tarald. 2010. The nanosyntax of Nguni noun class prefixes and concords. *Lingua* 120(6). 1522–1548.

Taraldsen, Knut Tarald. 2017. A recalcitrant syncretism. *Rivista di Grammatica Generativa — Research in Generative Grammar* 39(1). 3.1–8.

Taraldsen, Knut Tarald. 2019. An introduction to Nanosyntax. *Linguistics Vanguard* 5(1).

Taraldsen, Knut Tarald, Lucie Taraldsen Medová & David Langa. 2018. Class prefixes as specifiers in Southern Bantu. *Natural Language & Linguistic Theory*. 1–56.

Türk, Utku. 2020. Tackling the augmentative puzzle in Turkish. In *Proceedings of the workshop on turkic and languages in contact with turkic*, vol. 5, 155–162.

Uriagereka, Juan. 1999. Multiple spell-out. In Samuel Epstein & Norbert Hornstein (eds.), *Working minimalism*, 251–282. Cambridge, Massachusetts: MIT Press.

Vanden Wyngaerd, Guido. 2018. The feature structure of pronouns: a probe into multidimensional paradigms. In Lena Baunaz, Karen De Clercq, Liliane Haegeman & Eric Lander (eds.), *Exploring nanosyntax*, 277–304. Oxford: Oxford University Press.

Vanden Wyngaerd, Guido, Michal Starke, Karen De Clercq & Pavel Caha. 2020. How to be positive. *Glossa* 5(1). 23.

Wągiel, Marcin & Pavel Caha. 2020. Universal semantic features and the typology of cardinal numerals. *Catalan Journal of Linguistics* 19. 199–229.

Wiland, Bartosz. 2018. A note on lexicalizing 'what' and 'who' in Russian and in Polish. *Poznan Studies in Contemporary Linguistics* 54(4). 573–604.

Wiland, Bartosz. 2019. *The spell-out algorithm and lexicalization patterns. slavic verbs and complementizers*. Berlin: Language Science Press. https://langsci-press.org/catalog/book/242.

Ziková, Markéta. 2018. *Licensing of vowel length in Czech. The syntax-phonology interface*. Berlin: Peter Lang.

Zwicky, Arnold. 1969. Phonological constraints in syntactic descriptions. *Papers in Linguistics* 1. 411–453.

Zwicky, Arnold & Geoffrey Pullum. 1986. The principle of phonology-free syntax: introductory remarks. *Working papers in Linguistics* 32. 63–91.

2 Russian Declension

Pavel Caha

Background

In the introductory chapter (Section 1.6), I gave an example as to how crosslinguistic differences between 2nd person plural pronouns can be modeled using the idea of root size. The idea was that Mandarin had no lexical entry that would be 'big enough' to spell out 2nd person features and plural as one piece, and therefore, it had to introduce the plural marker *-men* as the spellout of plural. The other languages discussed in Section 1.6 did have a lexical entry that was 'big enough' to spellout all the features, and so they had a monomorphemic 2nd person plural. In the current chapter, I use the very same idea (namely that lexical items can differ in size) to explain intra-language variation. More specifically, the idea I shall explore in this chapter is that if within one and a single language, the lexicon contains nouns with lexical entries of different size, each of the nouns will have a slightly different behavior. The hypothesis I put forth is that declension classes arise as a result of such a situation.

The article discusses the Russian declension, nevertheless similar facts are found across a number of Slavic languages, including Czech. The reason why I chose Russian as the language to be described (rather than Czech) is not because Russian would be somehow inherently more interesting – the reason was pragmatic: an article on Russian will attract a wider readership than an article on Czech, while allowing me to lay out the basic ideas on a material that closely resembles Czech. Currently, I am supervising a PhD student (Lucie Janků) who is applying the same set of ideas to the Czech declension. Her thesis (to be defended in the course of 2022) demonstrates the viability of the analytic tools in the context of the Czech declension.

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AKADÉMIAI KIADÓ

Modeling declensions without declension features. The case of Russian

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ABSTRACT

This paper presents an analysis of the Russian declension in Nanosyntax (Starke 2009, 2018). The analysis has two theoretically important aspects. First, it makes no reference to language-particular declension features. This allows one to maintain the idea that morphosyntactic features are drawn from a set provided by the UG, i.e., language invariant. The analysis also does not use contextual rules. In order to correctly pair the right ending with a particular root, the analysis only relies on specifying each marker for the features it spells out. The correct pairing of roots and affixes falls out from such a specification and the Nanosyntax model of spellout.

KEYWORDS

Nanosyntax, declension, Russian, morphology, syntax

1. THE ARBITRARY NATURE OF DECLENSIONS

Let me start by introducing two Russian nouns, namely 'snowstorm' and 'week.' Their roots are given in (1).

(1) Russian
a. *metel'*- 'snowstorm'
b. *nedel'*- 'week'

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3 The Fine structure of the comparative

Pavel Caha & Karen De Clercq & Guido Vanden Wyngaerd

Background

The article that is contained in this chapter has been published in *Studia Linguistica* in 2019. It is the "oldest" article in the current collection (written 2017). It proposes that different adjectival roots in Czech are lexically associated to trees of different sizes, and this influences the morphological marking of the comparative. The current chapter is actually the first place where the idea of using differential root size to model allomorph selection by roots appears for the first time.

The second idea that is defended here concerns root suppletion. The idea we put forth is that two roots in a suppletive pair (like *good* vs. *bett-*) are not specified for the exact same set of features, but they differ in size, just like two allomorphic endings do. In addition, we propose that suppletive roots are related to each other via pointers (a device that has been briefly mentioned in the previous chapter).

This being the oldest chapter, there are also a couple of theoretical proposals that do not directly match with the theory contained in the remaining chapters. The one that is perhaps the easiest to notice is that we abandon here the Elsewhere Condition and replace it by the so-called Faithfulness Condition, which is a position that we have abandoned in our later thinking. However, the difference does not affect much of the substance, as far as I can see, and I include this article here for what I consider to be its real value, namely the idea that (arbitrary) root size is an interesting theoretical tool that allows for an elegant encoding of allomorph selection on the one hand, and root suppletion on the other.

I also want to add that the theory offered in the article leaves one open issue, which is the analysis of a class of adjectives like 'sweet' – 'sweeter' (*slad-k-ý – slad-š-í*). We acknowledge this issue in Footnote 10 of the article.

Since the publication of the current article, we have worked out two different analyses of this pattern. One of these options has been published as an article in Glossa (Vanden Wyngaerd et al. 2020). We propose there that this pattern actually requires one to abandon the containment relation between the positive and the comparative, which is something that we rely on here. This move allowed us to incorporate the pattern of the adjective 'sweet,' but in effect, it requires that much of the content of the current article must be rethought and adjusted to the non-containment structures. This turned out to be a difficult task and it raised some issues that we are still not able to successfully address.

In part as a result of this, we continued exploring this class of adjectives and we have discovered a new type of analysis that we are currently exploring. This alternative allows us to preserve containment between the positive and the comparative, and it therefore allows us to keep all the proposals in this article intact (while successfully incorporating the additional pattern of the adjective 'sweet'). We have reached this goal by introducing (for the purpose of the 'sweet' class of adjectives) a new type of lexical entries, explored for the first time in Blix (2021), which we call Movement Containing Trees (MCTs). The idea behind MCTs is that lexical trees differ not only in their size, but they may also code movement of the 'root' constituent to various heights within the functional sequence. I describe this solution at the end of the current chapter, in an appendix to the article.

The last point of this background section is to clarify my role as a contributor to this article. In the initial footnote of the article that follows, it is stated that the authors are listed alphabetically, which is a remark that is intended to convey the idea that we have contributed to this article equally. We discussed the ideas presented here very often with each other and we each contributed to the writing, re-writing, editing, etc. As a result, the contributions of the individual authors are difficult to separate.

References

Blix, Hagen. 2021. Phrasal spellout and partial overwrite: on an alternative to backtracking. *Glossa: a journal of general linguistics* 6(1).

Vanden Wyngaerd, Guido, Michal Starke, Karen De Clercq & Pavel Caha. 2020. How to be positive. *Glossa: a journal of general linguistics* 5(1). 23.1–34.

STUDIA LINGUISTICA
A JOURNAL OF GENERAL LINGUISTICS

THE FINE STRUCTURE OF THE COMPARATIVE*

Pavel Caha, Karen De Clercq & Guido Vanden Wyngaerd

Abstract. The paper provides evidence for a more articulated structure of the comparative as compared with the one in Bobaljik (2012). We propose to split up Bobaljik's CMPR head into two distinct heads, C1 and C2. Looking at Czech, Old Church Slavonic and English, we show that this proposal explains a range of facts about suppletion and allomorphy. A crucial ingredient of our analysis is the claim that adjectival roots are not a-categorial, but spell out adjectival functional structure. Specifically, we argue that adjectival roots come in various types, differing in the amount of functional structure they spell out. In order to correctly model the competition between roots, we further introduce a Faithfulness Restriction on Cyclic Override, which allows us to dispense with the Elsewhere Principle.

1. Introduction

The seminal study of Bobaljik (2012) has put the morphosyntax of degree comparison firmly on the research agenda. Central to his claims is the Containment Hypothesis (Bobaljik 2012:4):

(1) *Containment Hypothesis*
The representation of the superlative properly contains that of the comparative.

A language like Czech provides overt morphological evidence for this hypothesis, in that the marker of the comparative (*–ějš*) also shows up in the superlative, which adds the prefix *nej–* to the comparative form:[1]

(2)

POS	CMPR	SPRL	
mil-ý	mil-ejš-í	nej-mil-ejš-í	'nice/kind'
červen-ý	červen-ějš-í	nej-červen-ějš-í	'red'
hloup-ý	hloup-ějš-í	nej-hloup-ějš-í	'stupid'
bujar-ý	bujař-ejš-í	nej-bujař-ejš-í	'merry'

The syntax Bobaljik proposes is accordingly as in (3). The crucial part of the tree is the containment relation between the degrees, such that the

*The authors are listed in alphabetical order. We wish to thank the anonymous reviewers for *Studia Linguistica*, Anna Szabolcsi, Edwin Williams, the ComForT research group at KU Leuven, as well as the audience at the 2018 Olinco conference in Olomouc for their feedback. Pavel Caha's work on this paper was supported by a grant from the Czech Science Foundation Grantová Agentura České Republiky (GAČR) number GA17-10144S.

[1] The final vowels in these forms are concord markers. We ignore them in what follows.

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Appendix

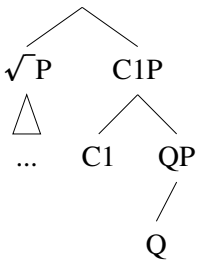
In this appendix, it is my goal to close one gap that we have left open in the article. The gap concerns the analysis of the adjective 'sweet' (*slad-k-ý*) and its comparative (*slad-š-í*), where the derivational suffix *-k* is dropped in the comparative. The pattern is repeated in (1a) (it has been mentioned in Footnote 10 of the article). It contrasts with the pattern in (1b), which we analyze in the main text. In the example, I gloss the morpheme *-k* as AUG for 'augment.' Note that I adopt here a specific analysis of the pattern in (1b), where in the comparative, the augment is actually followed by *-š*, rather than by a Ø. Through palatalization (*kluz-č-š-í*) and cluster simplification, we get the surface form *kluz-č-í*.

(1) a. slad -k -ý — slad -š -í
sweet AUG AGR sweet C2 AGR

b. kluz -k -ý — kluz -k -š -í (→ kluz-č-í)
slippery AUG AGR sweet AUG C2 AGR

What I now want to show is how we can incorporate the pattern in (1a) into our theory without changing the rest of the analysis as presented in the article. The idea to be presented is based on our joint work subsequent to the publication of the article. The proposal relies on the idea that there is a "moved root inside the lexical item" (as we have phrased it in Footnote 10). However, the particular lexical entry we have proposed in the footnote does indeed "raises some technical and empirical issues," and that is why a slightly different solution is needed. The correct lexical entry is depicted in (2).

(2) C1P ⟺ */slad/* (SWEET)



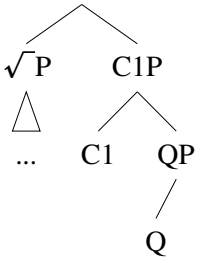
The first thing to note about this entry is that it is of the size C1P. This is what makes it combine with *-š* in the comparative. However, unlike 'standard' C1P roots, the lowermost √P is displaced to the top of the tree. The displacement is due to spellout movement having moved the √P to the left, and that is why we call such trees 'movement-containing trees,' MCTs for short. The explanatory power of MCTs has been recently investigated in work by Hagen Blix (Blix 2021).

The fact that lexical trees may also code movement in addition to size introduces a second

parameter of variation. Moreover, movement itself is known to vary along two parameters, namely in the size of the moving constituent (pied-piping) and the height of movement. In our ongoing work, we investigate in a systematic fashion how these two parameters influence the derivations and the surface patterns. In this appendix, I sidestep much of this discussion and I only focus on how the lexical item (2) yields the pattern depicted in (1a).

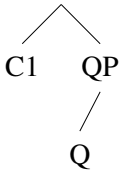
To begin with, the numbered points (3) to (5) depict all the relevant lexical items. Notice that I introduce here a version of the analysis where the augment *-k* (5) only spells out C1 (but not C2). C2 is therefore spelled out by *-š*, recall (1b). The lexical entry of *-š* is given in (4).

(3) C1P ⟺ /SLAD/



(4) C2P ⟺ /š (CMPR2)/

(5) C1P ⟺ /-K/



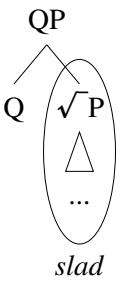
The spellout algorithm is repeated in (6).

(6) a. Merge F and spell out FP
b. If (a) fails, move the spec of the complement of F and spell out FP
c. If (b) fails, move the complement of F and spell out FP

The derivation starts by constructing √P. The √P is spelled out as *slad* 'sweet,' see (7). There is a match here because √P is contained as a subconstituent in (3).

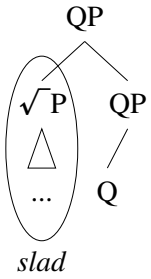
(7)

(8)

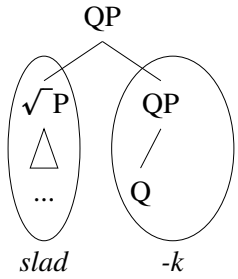


The next step is to introduce Q, yielding (8). (8) is not matched by the root's lexical entry (3); as a result, rescue movements are triggered. Spec movement is undefined in (8), therefore, complement movement takes place. The result is shown in (9).

(9)



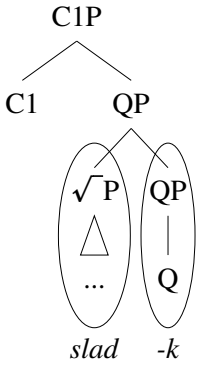
(10)



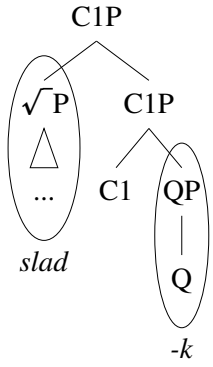
In (9), the remnant QP is matched by the augment *-k*, and so we get a successful spellout, see (10). This structure corresponds to the positive degree. It is worth pointing out that the whole structure (10) cannot be spelled out by the root *slad*. This is the case despite the fact that the entry (3) contains the √P and also Q. However, the lexical entry does not contain a subconstituent that matches the top node in (10). (The reader may notice that our solution in footnote 10 of the published article would predict a match here.)

The derivation now continues by merging C1, yielding the structure (11). This structure cannot be spelled out as is, and rescue movements are activated. (12) shows the result of the first option, namely Spec movement.

(11)

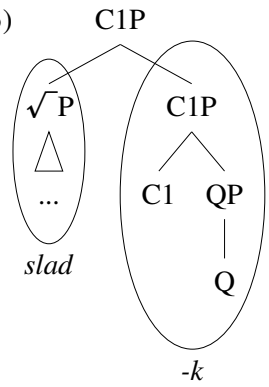


(12)

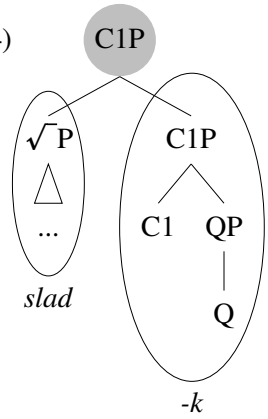


There are two different ways how (12) can be spelled out. One option is to spell out the remnant C1P by the augment *-k*, deriving the C1P shape *slad-k*. I show this in (13).

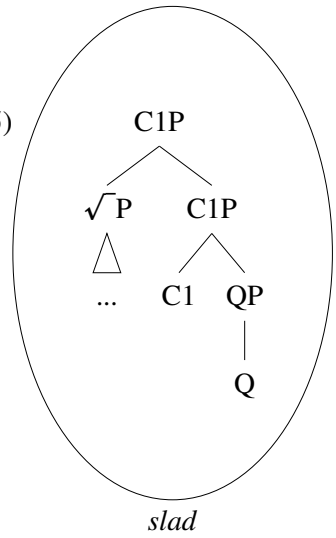
(13)



(14)



(15)



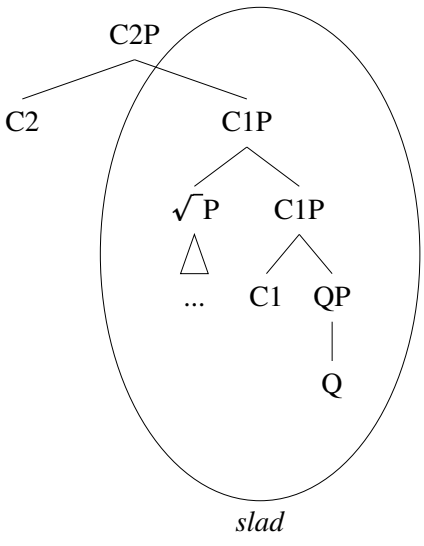
Interestingly, the lexical entry (3) also matches the topmost C1P node. The relevant node is highlighted in (14). We can see that the tree-shape is identical to the lexical entry (3).

Therefore, as the second option, we also allow that the whole C1P (with the displaced √P node) may be spelled out as *slad*, see (15). We assume (following Blix 2021) that this is the preferred option, and therefore, that C1P is indeed spelled out as *slad-*.

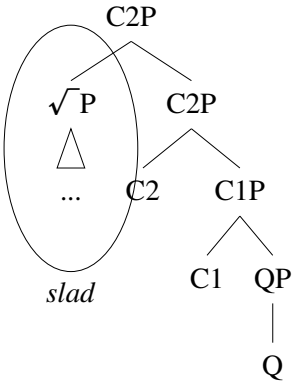
Note that *slad* 'sweet' differs from *kluz-k-* 'slippery' precisely in the ability to spell out C1P. I.e., we still assume that *kluz-* is a small root that can only spell out √P. Therefore, *kluz-k* 'slippery' will have the spellout as in (13). On the other hand, *slad-* spells out the whole C1P in (15). An interesting feature of this solution is that the whole C1P is spelled out by the root 'sweet,' event though the root cannot spell out QP (where it needs an augment). This is due to the constituency of the MCT in (3).

The derivation now continues by merging C2, see (16).

(16)



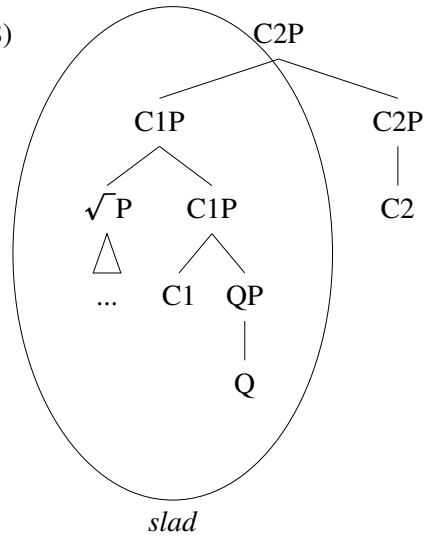
(17)



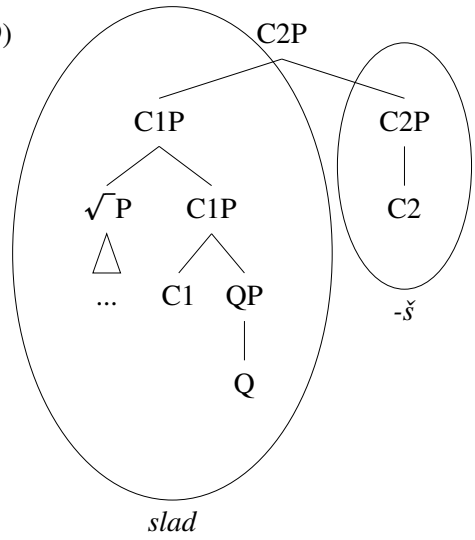
The structure cannot be spelled out using the first clause of the algorithm (spell out FP), since the C2P in (16) is not contained in any lexical entry. Therefore, rescue movements are activated. The first rescue movement to be tried is Spec movement. Spec movement displaces the √P sitting in the Spec of C1P, despite the fact that this is going to 'disturb' the previous spellout of the C1P constituent. The result of the movement is in (17).

However, there is no match for the remnant C2P in (17) (recall that we are relying here on the analysis where *-k* only spells out [C1 [Q]]). Since there is no match in (17), we continue to complement movement. This step displaces the complement of C2 in (16) to its Spec, with the result in (18).

(18)



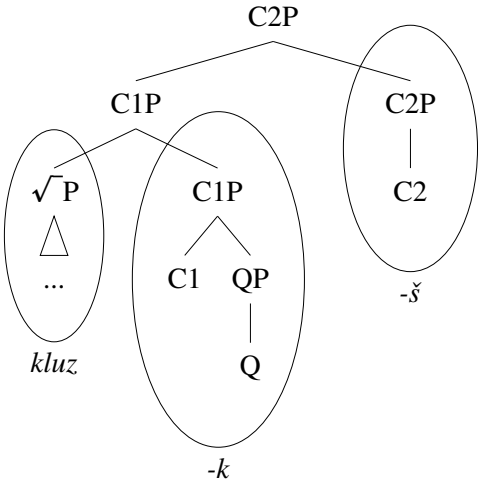
(19)



In this structure, the remnant C2P can be spelles out by *-š*, which is shown in (19). We therefore correctly derive the *slad-k-ý — slad-š-í* class, which has the augment *-k* in the positive (recall (10)), but loses it in the comparative.

In this solution, the structure of the class *kluzk-ý — kluz-k-š-í* 'slippery' is exactly the same as in (19), with the difference that the constituent in the Spec of C2 is spelled out as the combination of the root *kluz-* (spelling out √P) and the augment *-k* (spelling out C1+Q), see (20).

(20)



What we achieve this way is that we can keep the rest of our analysis intact, while incorporating the 'sweet' class into the theory. What allows us to do this is the use of Movement Containing Trees (Blix 2021), recall (3).

References

Blix, Hagen. 2021. Phrasal spellout and partial overwrite: on an alternative to backtracking. *Glossa: a journal of general linguistics* 6(1).

Vanden Wyngaerd, Guido, Michal Starke, Karen De Clercq & Pavel Caha. 2020. How to be positive. *Glossa: a journal of general linguistics* 5(1). 23.1–34.

4 Complex Simplex Numerals

Marcin Wągiel & Pavel Caha

Background

This (co-authored) article contained in this chapter has been published in *Acta Linguistica Academica* in 2021. We investigate here two different kinds of numerals and the morphological relationship between them. The two different kinds of numerals we focus on are called object-counting numerals and abstract-counting numerals. Object-counting numerals are used to count objects (***three*** *books*), abstract-counting numerals are used for abstract arithmetic counting (***three*** *times two is six*).

These two different types of numerals are sometimes marked differently and we set up a morphological typology that describes the types of relations between the numerals. The main point of including the article in this collection is that the morphological typology we arrive at can be modeled in terms of differential root size. This, in turn, show the applicability of the general idea in a new domain.

As for the relevance of this article to the area of my habilitation (Czech linguistics), I point out that one of the languages included in the study is Czech (p. 476).

Let me now turn to describing the contribution of individual authors. The original research idea (comparing the morphology of abstract-counting vs. object-counting numerals) is Marcin's. The idea is described in Sections 1 and 2, where Marcin is the sole author.

Sections 3-5 describe different morphological relations between abstract-counting and object-counting numerals. The data in these sections are organized according to a morphological typology that is the result of our joint work and the contribution of individual authors is difficult to separate. The data used in these sections come mainly from Marcin's data collections, though I also contributed data on Czech, Upper Necaxa Totonac, Luwo, Vera'a, Shuhi and Mokilese.

Section 6 describes the semantics of the structures we propose. Marcin is the sole author of this section.

Section 7 describes how the morphological typology is derived by the Nanosyntax spellout procedure, taking for granted the structures proposed in Section 6. I am the sole author of this section.

Following the article, I include an appendix that (once again) brings up the issue of Movement Containing Trees (MCTs).

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AKADÉMIAI KIADÓ

Complex simplex numerals

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ABSTRACT

It is commonly assumed that basic cardinal numerals such as English *three* are simplex expressions whose primary function is to quantify over entities denoted by the modified NP (e.g., Kennedy 2015; Rothstein 2017; Ionin & Matushansky 2018). In this paper, we explore cross-linguistic marking patterns suggesting that cardinals in fact lexicalize complex syntactic and semantic structures derived from the primitive notion of the number scale. The evidence we will investigate comes from various morphological shapes of cardinal numerals when used to count objects and when used for abstract arithmetical counting.

KEYWORDS

cardinal numerals, typology, morphosemantics, Nanosyntax

1. INTRODUCTION

Though cardinals can be used in various ways (for an overview, see e.g., Bultinck 2005), their most widely studied function is to enumerate entities designated by the noun. For instance, the numeral *three* in sentences such as (1) is used as a prenominal modifier which quantifies over individuals in the denotation of the modified NP. In (1a), it specifies the number of apples that fell from the table, whereas in (1b) the total number of the relevant musketeers. We will refer to this function as OBJECT COUNTING.

(1) a. **Three** apples fell from the table.
b. The **three** musketeers fought bravely.

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Appendix

The goal of this appendix is to point out that the device of Movement Containing Trees (MCTs) allows us to capture one additional pattern of marking. (Recall that MCTs have been discussed in the appendix to the previous Chapter 3.)

Let me start by introducing the additional marking pattern. We have discussed it in a related article (Wągiel & Caha 2020) and we mention its existence in Footnote 3 of the current paper. We label this additional pattern as the INVERSE pattern. The inverse pattern describes a case where the abstract-counting numeral morphologically contains the object-counting numeral (which is the 'inverse' of the common stacking pattern). A potential example of such a pattern is found in German, where the abstract-counting numeral 'one' is morphologically complex (*ein-s*):

(1) German

a. Zehn geteilt durch ein-s ist gleich zehn.
ten divided by one-NBR is equal ten
'Ten divided by one equals ten.'

b. *Zehn geteilt durch ein ist zehn.
ten divided by one is ten

On the other hand, the object-counting use can feature a bare numeral, as in (2).

(2) German

a. ein Mädchen
one girl
'one girl'

b. *ein-s Mädchen
one-NBR girl

It thus appears that while the bare root *ein* can fulfill the object-counting function, it cannot fulfill the abstract-counting function. In Wągiel & Caha (2020), we have analyzed this pattern as a special instance of the complex suppletive pattern. Our idea was that since the numeral is morphologically complex already in the abstract-counting use (*ein-s*), this means that *ein* only spells out SCALE, and *-s* spells out NUM. The only way to end up with a bare root in the object-counting function then was to propose a silent -Ø morpheme spelling out NUM+CL.

The idea of a zero is partly justified on paradigmatic grounds, as shown in Table (3). The table shows the shape of the object-counting numeral depending on the case and the gender of the counted noun. We can see that only the NOM.SG of the masculine gender is unmarked, as shown in (3).

(3) German numeral ‘one’

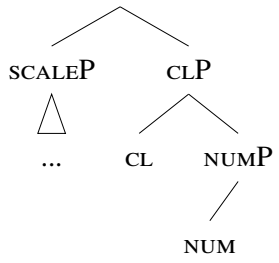
	Masculine	Neuter	Feminine
NOM	ein-Ø	ein-Ø	ein-e
ACC	ein-en	ein-Ø	ein-e
GEN	ein-es	ein-es	ein-er
DAT	ein-em	ein-em	ein-er

However, there are other languages with suspected inverse patterns, including the Hungarian *kettő* ∼ *két* (both ‘two’), the Eastern Basque *biga* ∼ *bi* (both ‘two’) and the Palestinian Arabic *xams-a* ∼ *xams* both ‘five.’ In case these examples turn out to be instances of the abstract- vs. object-counting distinction (which is not always clear for various reasons), the zero solution becomes less attractive, since these languages generally lack concord of the German type.

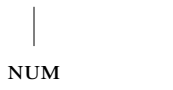
It turns out that the INVERSE pattern finds a natural encoding when we admit into our theory not only variation in the size of the lexical trees, but also in the shape of the trees, i.e., including movement containing trees (MCTs).

In what follows, I show that if the lexical entry of the German numeral ‘one’ would be as in (4), with the abstract-counting *-s* in (5), then the inverse pattern is successfully derived, using the exact same spellout algorithm as throughout this thesis.

(4) CLP ⟺ */ein/*



(5) NUMP ⟺ /-S/



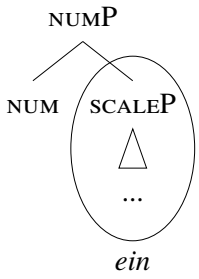
The spellout algorithm is repeated in (6).

(6) a. Merge F and spell out FP
b. If (a) fails, move the spec of the complement of F and spell out FP
c. If (b) fails, move the complement of F and spell out FP

The derivation starts by constructing scaleP. The scaleP is spelled out as *ein* 'one,' see (7). There is a match here because scaleP is contained as a subconstituent in (4).

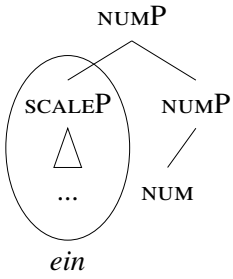
(7)

(8)

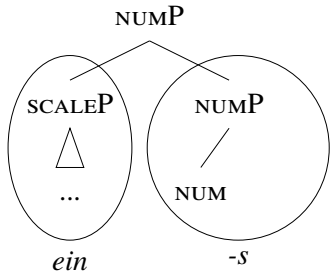


The next step is to introduce num, yielding (8). (8) is not matched by the root's lexical entry (4); as a result, rescue movements are triggered. Spec movement is undefined in (8), therefore, complement movement takes place. The result is shown in (9).

(9)



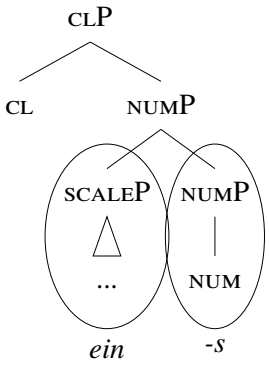
(10)



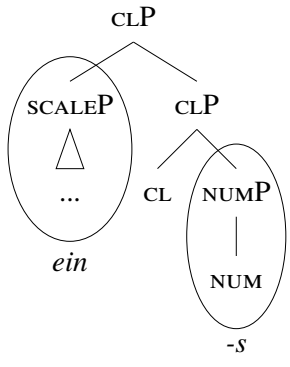
In (9), the remnant numP is matched by the abstract-counting marker *-s*, and so we get a successful spellout, see (10). This structure corresponds to the abstract-counting numeral. It is worth pointing out that the whole structure (10) cannot be spelled out by the numeral root *ein*. This is so despite the fact that the entry (4) contains the scaleP and also num. However, the lexical entry does not contain a subconstituent that matches the top node in (10).

The derivation now continues by merging cl, yielding the structure (11). This structure cannot be spelled out as is, and rescue movements are activated. (12) shows the result of the first option, namely Spec movement.

(11)

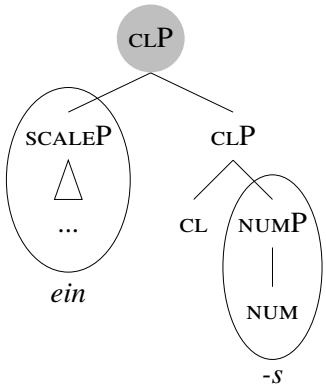


(12)

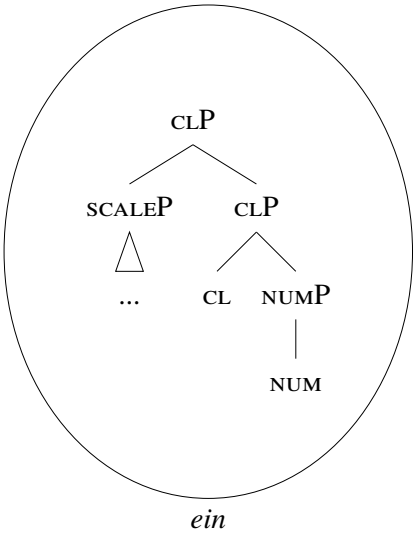


After the movement, the lexical entry (4) matches the topmost CLP node. The relevant node is highlighted in (13). We can see that the tree-shape is identical to the lexical entry (4).

(13)



(14)



Therefore, the MCT for *ein* in (4) allows that the whole object-counting structure CLP (with the displaced SCALEP node) may be spelled out as *ein*, see (14).

This demonstration concludes the appendix. Its goal was to show that when we take MCTs into consideration, we augment our descriptive capacity to cover also an additional pattern, namely the INVERSE pattern.

References

Wągiel, Marcin & Pavel Caha. 2020. Universal semantic features and the typology of cardinal numerals. *Catalan Journal of Linguistics* 19. 199–229.

5 The marking of mass, count and plural denotations in multi-dimensional paradigms

Pavel Caha

Background

This chapter contains an article that is currently published in *Studia Linguistica* as an "early-access" article. The name of the article is quite descriptive. In my thinking, it developed from a manuscript entitled *GEN.SG = NOM.PL: a mystery solved?* I wrote this latter paper back in 2012, and revised it for publication in *Linguistica Brunensia* in 2016, where it appeared in a Festshrift for Petr Karlík.

The mystery I intended to solve was, as the title stated, the fact that in quite a few paradigms in Czech (as well as in other languages), the nominative plural case is the same as the genitive singular. I illustrate this fact in a couple of paradigms in (1).

(1) Czech declension, fragment

	wife, SG	wife, PL	song, SG	song, PL	bone SG	bone PL	car SG	car PL
NOM	žen-a	žen-y	píseň-ø	písn-ě	kost-ø	kost-i	aut-o	aut-a
ACC	žen-u	žen-y	píseň-ø	písn-ě	kost-ø	kost-i	aut-o	aut-a
GEN	žen-y	žen-ø	písn-ě	písn-í	kost-i	kost-í	aut-a	aut-Ø
LOC	žen-ě	žen-ách	písn-i	písn-ích	kost-i	kost-ech	aut-u	aut-ech
DAT	žen-ě	žen-ám	písn-i	písn-ím	kost-i	kost-em	aut-u	aut-ům
INS	žen-ou	žen-ama	písn-í	písn-ěma	kost-í	kost-ma	aut-em	aut-ama

This syncretism has been noted in the literature earlier, and it has always been ridiculed. Baerman, Brown & Corbett (2002) state that "[f]ew would dispute that these patterns have come about by chance as a result of independent phonological developments, and [...] no Gesamtbedeutung [common meaning] should be sought." Wunderlich (2004) designates this as "an accidental syncretism, caused by reasons other than underspecification."

I have personally always been haunted by the desire to understand this syncretism. In this chapter, I present my current stage of research on this issue. I am sure that I still understand only a very small part of the picture, but I also think that I have caught an interesting track as to how one could perhaps make sense of this syncretism in the future. I want to say here a couple of words on how this track opened up for me.

The first relevant thing that caught my attention was the fact that in Serbian, numerals 2-4 require a special form of the noun that the grammar calls 'the counting form.' The counting form has a special form for masculine adjectives, but for nouns, it is always syncretic with some other form. In masculine nouns, it is always the same as the genitive singular, with feminine nouns, it is always the same as the nominative plural.

This fact revealed to me that in Serbian, GEN.SG and NOM.PL are not directly related to each other; rather, they seem to have this mysterious 'counting form' in between them as an intermediate category that is sometimes like GEN.SG, sometimes like NOM.PL. This suggested to me that the answer to my question: why is GEN.SG the same as NOM.PL should be broken down into two smaller questions. The first one: why can NOM.PL have the same form as the noun after numerals? And the second one: why can the form after numerals be sometimes the same as the genitive singular?

Let me start from the latter question (GEN.SG being the same as the form required by numerals). One of the issues here was to unpack the notion of GEN.SG. Specifically, it is well known that the genitive case has very many functions in grammars. Which one of these uses should be related to the counting form? All of them? Or are there some that seem to be closer to the counting form than other uses?

Most prototypically, the genitive case functions as a complement of a noun. Most approaches, however, take this function to be the relevant function to explain why numerals are followed by GEN: it is because numerals used to be nouns diachronically. I have explored this link myself in several papers. However, this is not the track I follow in the current paper.

The new approach I suggest here looks at a different function of the genitive than the 'complement-of-noun' function. Specifically, what caught my attention is that in Serbian, GEN.SG can also be used to mark indefinite mass nouns in object or subject positions, see (2a,b) respectively. Perhaps relatedly, it also appears on mass nouns that are in the complement position of a classifier noun, see (2c).

(2) Serbian (Hammond 2005)

a. Kupili smo čećer-a
bought we.are sugar-GEN
'We bought (some) sugar.' (indefinite mass object)

b. Bilo je vod-e u česmi.
be there.is water-GEN in tap
'There was water in the tap.' (indefinite mass subject in existentials/locatives)

c. Molim vas, litar benzin-a.
I.ask you liter petrol-GEN
'A liter of petrol, please.' (pseudo-partitive)

The genitive in (2c) could again be thought of as a 'complement-of-noun' use, but the interesting thing is that countable nouns would have genitive *plural* here. Therefore, the fact that we find

the genitive *singular* must be thought of as indeed related to the count–mass distinction.

These observations made me think of the relationship between the genitive singular and the counted form as similar to a relationship between mass nouns, as in (2), and count nouns (since nouns after numerals must be count by definition). Under this view, the ambiguity between the GEN.SG and the counting form (which is in turn sometimes the same as NOM.PL) becomes a case of mass–count ambiguity. And the mass–count ambiguity is a known phenomenon, and moreover a very frequent one in Slavic. In other words, for the first time, I discovered a connection between GEN.SG and NOM.PL which seemed to run counter the received wisdom that "no Gesamtbedeutung should be sought."

Developing this reasoning further led me to understand the Serbian 'morphological' sequence of *forms*, i.e., GEN.SG – COUNTING FORM – NOM.PL, as instantiating a sequence that could be restated in *semantic* terms as the scale of MASS – COUNT – PLURAL denotations. In the article that follows, I tried to take the semantic sequence seriously and I try to see how much data (also beyond Slavic and beyond the original GEN.SG=NOM.PL syncretism) can be insightfully captured by this scale.

References

Baerman, Matthew, Dunstan Brown & Greville Corbett. 2002. Case syncretism in and out of Indo-European. In M. Andronis, C. Ball, H. Elston & S. Neuvel (eds.), *Papers from the 37th meeting, the main session, vol. 1*, 15–28. Chicago: Chicago Linguistic Society.

Hammond, Lila. 2005. *Serbian: an essential grammar*. London: Routledge.

Wunderlich, Dieter. 2004. Is there any need for the concept of directional syncretism? In Gereon Müller, Lutz Gunkel & Gisela Zifonun (eds.), *Explorations in nominal inflection*, 373–395. Berlin: Mouton de Gruyter.

STUDIA LINGUISTICA
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THE MARKING OF MASS, COUNT AND PLURAL DENOTATIONS IN MULTI-DIMENSIONAL PARADIGMS*

Pavel Caha

Abstract. This paper investigates the morphology of nouns in pseudo-partitive constructions, noun-numeral constructions and plurals. The data discussed reveal a *ABA pattern that restricts syncretism among these categories. Specifically, in the sequence pseudo-partitive, counting form and plural, only adjacent forms can be syncretic. I argue that the constraint can be derived from a particular morphosyntactic structure, where, following Borer (2005), mass nouns have the smallest structure, count nouns (found after numerals) are derived by dividing the mass into units, and plural is derived by restricting the count denotation to pluralities. The article further investigates how the relevant forms interact with case marking, and suggests that the forms should be organized into a two-dimensional paradigm space where syncretic forms occupy contiguous regions.

1. Introduction

This article explores the morphological marking of nouns in the three constructions listed in (1).

(1) a. pseudo-partitive constructions (*a meter of fence*)
    b. nouns after numerals (*three fences*)
    c. bare plurals (*fences*)

What is interesting about these three constructions is that across various languages, the nouns show various types of syncretism (i.e., the identity of marking). In the first part of the paper, my goal is to systematize these patterns. In order to do so, I always keep the same order of the constructions as in (1), and mark differences/syncretism by the (non-) identity of letters. For example, when there is no syncretism, this would be labelled as an ABC pattern. When the noun after numerals is the same as the plural, this represents an ABB pattern. This pattern is exemplified by Dutch, see (2).

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6 Conclusions

Pavel Caha

Let me conclude this thesis by highlighting what I believe to be the 'added value' of collecting the articles together. The most relevant property of this collection is that it consistently applies one and the same theory to a relatively large and diverse range of data. This has allowed me to showcase the descriptive power of a theory that, at its core, appears to me rather simple, with its two main components summarized in (1).

(1) The main ingredients of the theory
   a. A theory of matching based on
      (i) The Superset Principle
      (ii) The Elsewhere Condition
      (iii) and allowing for Pointers
   b. The Spellout algorithm, based on a recursive application of Merge F, followed by:
      (i) Spell out of FP
      (ii) Movement of Spec, spell out FP
      (iii) Movement of complement, spell out FP

Both of these central components of the Nanosyntactic approach are non-trivial – simply because they are quite different from what is currently assumed in various theories of morphology.

The final thing I want to do in this chapter is to discuss some directions for future research. In my own thinking about future directions to pursue, I divide them into two types of tasks. The first task is to investigate and address empirical cases where predictions (made by the model in (1)) are apparently not borne out. Perhaps the most relevant issue here is the issue of locality. As has been made clear in Chapter 3, the theory predicts that allomorphy and root suppletion are local, happening in the interaction between two structurally adjacent morphemes. This is indeed the normal case, and there have been proposals in the literature to the effect that such a restriction should be required to hold quite generally (see Siegel 1977, Embick 2015 among others).

However, cases have also been reported where it looks like root suppletion and/or affix allomorphy are triggered long distance, across intervening morphemes. Such types of interactions cannot be explained by the theory in (1). To give just one example, Choi & Harley (2019) argue for instance that in order to account for honorific suppletion in Korean, "it is necessary to allow conditioning by hierarchically and linearly nonlocal nodes".

The task that lies ahead here is to carefully consider the relevant evidence and see whether it may be possible to find an account of the facts that would be consistent with the principles outlined here. In the case of the work by Choi & Harley (2019), Vanden Wyngaerd, De Clercq & Caha (2021: 106) "argue that nonlocal conditioning of allomorphy is both unnecessary and undesirable. It is unnecessary once we enrich the structure involved in negation and honorification in Korean. It is also undesirable be cause it predicts the wrong results once the interaction between negation, causation, and honorification is taken into account." However, there are many cases to consider (Moskal & Smith 2016), and one needs to approach the facts with an open mind.

The second direction of future work is linked to the fact that the theory briefly sketched in (1) does not represent a complete theory. One of the main gaps that needs to be filled is to figure out how exactly prefixation works. The basic outline of such a theory has been provided in Starke (2018), and one of the current chapters (Chapter 3) briefly touches upon the issue. However, the precise details of this theory remain to be determined.

Another issue pertains to feature-driven movement and its possible integration within the spellout theory. The issue has been discussed in De Clercq (2019) and touched upon in Caha & Ziková (to appear), but it still remains to be integrated more fully within the overall picture.

References

Caha, Pavel & Markéta Ziková. to appear. Prefixes in Czech zero-derived nominalizations and verbs. In *Participles and nominalizations in Czech: new analytical directions*. München: LINCOM.

Choi, Jaehoon & Heidi Harley. 2019. Locality domains and morphological rules. Phases, heads, node-sprouting and suppletion in Korean honorification. *Natural Language & Linguistic Theory* 37. 1319–1365.

De Clercq, Karen. 2019. French negation, the superset principle and feature conservation. In Miriam Bouzouita, Anne Breitbarth, Lieven Danckaert & Elisabeth Witzenhausen (eds.), *Cycles in language change*, 199–227. Oxford: Oxford University Press.

Embick, David. 2015. *The morpheme: a theoretical introduction*. Berlin: De Gruyter.

Moskal, Beata & Peter W. Smith. 2016. Towards a theory without adjacency: hyper-contextual VI-rules. *Morphology* 26(3). 295–312. https://doi.org/10.1007/s11525-015-9275-y.

Siegel, Dorothy. 1977. The adjacency constraint and the theory of morphology. *Proceedings of NELS* 8. 189–197.

Starke, Michal. 2018. Complex left branches, spellout, and prefixes. In Lena Baunaz, Karen De Clercq, Liliane Haegeman & Eric Lander (eds.), *Exploring nanosyntax*, 239–249. Oxford: Oxford University Press.

Vanden Wyngaerd, Guido, Karen De Clercq & Pavel Caha. 2021. Late insertion and root suppletion. *Revista Virtual de Estudos da Linguagem - ReVEL* 19(18). 81–123.