

# How to be positive

Guido Vanden Wyngaerd  
*KU Leuven*

Warmoesberg 26, 1000 Brussel  
guido.vandenwyngaerd@kuleuven.be

Karen De Clercq  
*Ghent University*

Blandijnberg 2, 9000 Gent  
karen.declercq@ugent.be

Michal Starke

*Masaryk University*

Arna Nováka 1, 602 00 Brno  
michal@auf.net

Pavel Caha

*Masaryk University*

Arna Nováka 1, 602 00 Brno  
pavel.caha@phil.muni.cz

**Abstract** We discuss a cross-linguistically rare pattern of comparative formation found in Slovak. This pattern is theoretically interesting, because it violates a candidate universal on the relationship between the positive and the comparative degree. The universal, discussed recently in [Grano & Davis \(2018\)](#), says that the comparative is always either identical to, or derived from the positive degree. This universal is violated by a number of adjectives in Slovak. These adjectives have a suffix in the positive degree, which is absent in the comparative. We capture this pattern in terms of a non-containment structure of the positive and the comparative degrees and the nanosyntax model of spellout ([Starke 2009](#) et seq.).

**Keywords:** adjectives; gradability; positive; comparative; containment

## 1 Introduction

We start by presenting some background on comparatives in Slovak. Consider first the data in (1):<sup>1</sup>

---

<sup>1</sup> Accents over vowels indicate length. Wedges over consonants indicate palatalisation. For instance, *š* is IPA ʃ, *ž* (to be encountered later) is IPA ʒ. The difference between orthographic *i* and *y* in the agreement ending represents the difference between soft and hard declension.

(1)

POSITIVE	COMPARATIVE	
star-ý	star- š-í	‘old’ CONTAINMENT
múdr-y	múdr-ejš-í	‘wise’
sliz-k-ý	sliz-k-ejš-í	‘slim-y’

The first thing to note is that all the forms can be segmented into an adjectival base followed by an agreement marker (-y/-ý in the positive and -í in the comparative). We are setting these aside in our analysis, since the main focus of our paper rests on how the comparative is formed. In the table (1), the comparative is always formed by taking the positive degree (minus agreement) and suffixing it with (e)š (followed again by agreement). The comparative marker shows an allomorphy between the markers š and ejš, which we shall disregard for now.<sup>2</sup>

It will become highly relevant that the same procedure is observed also by adjectives that are morphologically complex in the positive degree. An example of such an adjective is on the bottom line of (1). The adjective consists of a root, followed by a suffix -k, followed by the agreement marker. We shall refer to this marker -k as an *augment*. In the adjective *sliz-k-ý* ‘slimy,’ the augment is preserved in the comparative, giving rise to *sliz-k-ejš-í* ‘slimier.’ We label such a pattern of comparative formation the CONTAINMENT pattern, because of the fact that the positive degree is used as the basis to which the comparative marker -(e)š attaches.

Against this background, consider the fact that adjectives with augments sometimes show a different pattern of comparative formation, given on the bottom line of the table below:

(2)

POSITIVE	COMPARATIVE	
star-ý	star- š-í	‘old’ CONTAINMENT
múdr-y	múdr-ejš-í	‘wise’
sliz-k-ý	sliz-k-ejš-í	‘slim-y’
ťaž-k-ý	ťaž- š-í	‘heav-y’ TRUNCATION

What we see here is that for the adjective *ťaž-k-ý* ‘heavy,’ the expected form *\*ťaž-k-ejš-í* is ungrammatical; instead, the augment must be dropped before

<sup>2</sup> Traditional grammars describe this allomorphy as phonologically governed, the short allomorph (š) appearing after a single consonant, the long one (ejš) when more than one consonant precedes (Dvonč et al. 1966: 210-12). While we are not aware of counterexamples, we do not rule out the possibility that there may be a morphosyntactic principle underlying the distribution of these allomorphs, as is the case in Czech (Caha et al. 2019).

the comparative marker in the correct form *ťaž-š-í* ‘heavier’. We will call this the TRUNCATION pattern: the comparative contains something which is less than the form of the positive degree, even when discounting the agreement marker.

The broader relevance of these data is linked to the truncation pattern in particular, because it contradicts a candidate universal proposed by Grano & Davis (2018: 133).

(3) *Candidate Universal*

Universally, the comparative form of a gradable adjective is derived from or identical to its positive form.

The way Grano & Davis (2018) understand this universal is to explicitly rule out a situation like the one found with the Slovak adjectives of the *ťaž-k-ý* ‘heavy’ class. As they put it, ‘it should [...] be impossible to find a language in which both the positive and comparative forms are independently derived from a common base’ (their pattern D; Grano & Davis 2018: 134). This is exactly what happens with *ťaž-k-ý* ‘heavy’, where the common base is the root *ťaž-*, to which the positive adds the suffix *-k*, whereas the comparative adds *-š*, both followed by an agreement marker.

Summarising the pattern illustrated by the adjectives in (2) schematically, we can distinguish the following three classes:

(4)

root	POS	CMPR
old	—	—
heav-y	AUG	—
slim-y	AUG	AUG

The adjectives of the *old* class have no augment, either in the positive or the comparative. The *heavy* class adjectives have an augment in the positive, but lose it in the comparative. The adjectives of the *slimy* class, finally, have an augment both in the positive and the comparative.

In what follows, we develop an analysis for this pattern, and its distribution in the Slovak adjective system. In section 2 we discuss the problem from the perspective of the relation between morphological and structural containment, and present a global outline of the analysis. In section 3 we present a detailed empirical overview of the Slovak evidence. Section 4 provides our hypothesis concerning the morphosyntactic structure of the positive and the comparative. Building on these structures, Section 5 gives a fully formal and algorithmic treatment of the patterns within nanosyntax. Section 6 discusses the relationship between the relevant patterns and sup-

pletion with special reference to Bobaljik (2012). Section 7 address some issues concerning the meaning of the positive and the comparative heads in the proposed framework.

## 2 Morphological and structural containment

There is a nontrivial relationship between structural and morphological containment. For example, Bobaljik (2012) has argued at length that the structure of the superlative contains the structure of the comparative. Yet at the same time, not all languages reflect this structural containment relationship in terms of morphological containment, whereby the superlative is formed by adding a morpheme to the comparative. In English, for example, a superlative like *short-est* does not contain the comparative form *short-er*. However, there are languages where the structural containment (argued to be universal by Bobaljik) is reflected in morphological containment as well. A case in point is again Slovak, where the superlative is formed by prefixing the comparative form with *naj-*. This is shown in (5) for the four adjective classes discussed earlier.

(5)

COMPARATIVE	SUPERLATIVE	
star-š-í	naj-star-š-í	‘old’
múdr-ejš-í	naj-múdr-ejš-í	‘wise’
sliz-k-ejš-í	naj-sliz-k-ejš-í	‘slim-y’
ťaž-š-í	naj-ťaž-š-í	‘heav-y’

Bobaljik does not put forth an explicit argument to the effect that the structure of the comparative contains the structure of the positive, but he understands that to be the null assumption (see Bobaljik 2012: 32, ex. (37)). If that is indeed the case, we have no trouble whatsoever explaining the containment pattern using the structures that Bobaljik proposes.



In (6a), the positive is taken to have a certain structure, and the comparative structure is derived by merging a comparative head on top of this

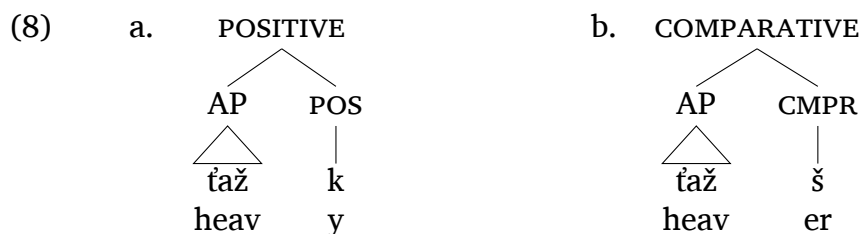
structure (as shown in (6b)). The containment pattern, illustrated here by the adjective *slim-y-er*, is straightforwardly predicted by such structures.

However, if we put a truncation-class adjective in the same structure, we inevitably end up with a wrong result, as shown in (7b).



The containment structure leads us to expect the form in (7b), which is however ungrammatical, the correct comparative form being *ťaž-š-í* ‘heavier’, without the augment. Its hypothetical English equivalent would correspond to the form *heav-er*, rather than *heav-y-er*. The conclusion we come to is that in order to account for the truncation pattern, we need a different structure.

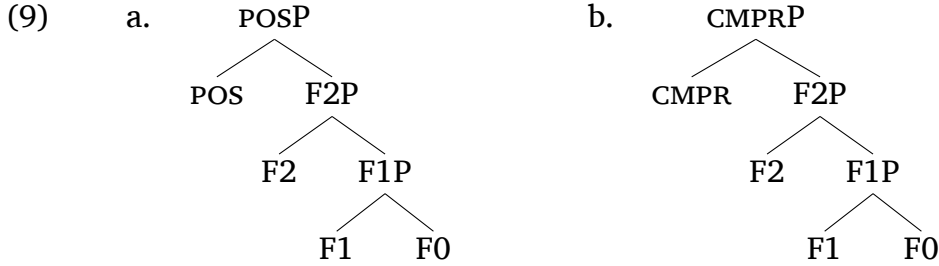
The alternative we propose is given in (8), and it relies on non-containment structures. These assume a decomposition of the positive degree into two parts (each potentially complex): an adjectival base (called AP for now) and a head POS, as shown in (8a). POS is a label that does not necessarily designate a specific head or a projection; its goal is simply to say that the positive degree has some structure that is not a part of the base to which the comparative attaches.



We will call the structures *symmetric* because the two degrees share a common base (AP), and each add a different head: POS in the positive and CMPR in the comparative. It is easy to see that these structures easily handle the truncation pattern. The augment is dropped in the comparative, because the POS head, which dominates the augment, is absent in the comparative. However, it seems harder to deal with the containment pattern, since by the same reasoning the augment should *always* be absent in the comparative.

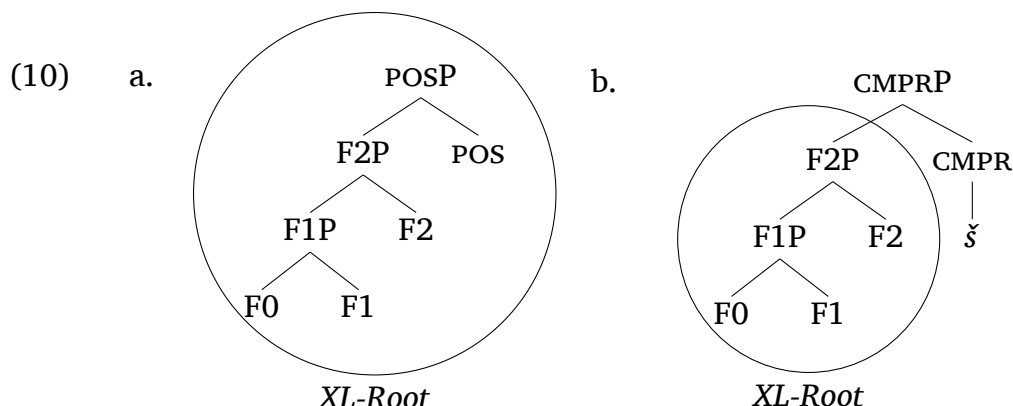
In order to handle containment, we shall need two additional proposals. The first one is a further decomposition of the AP. We will to argue that

the AP given in (8) decomposes into three projections, which (for now) we label simply F0, F1, and F2. Combining this decomposition of the AP with the idea of a symmetric relationship between the degrees, we end up with the hierarchies in (9) as the more refined version of the structures in (8) (ordering aside).



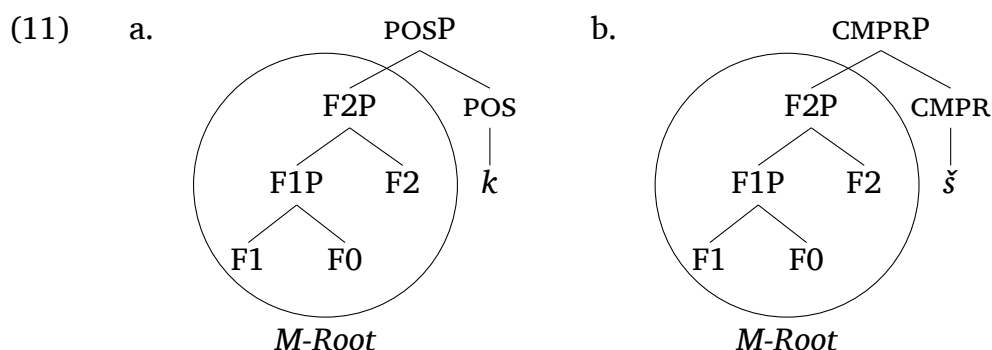
The second thing we need is phrasal spellout (Starke 2009). According to this proposal, roots as well as affixes may spell out phrasal constituents containing multiple heads. For example, an adjective that has no augment in the positive degree will be able to spell out the full POSP in (9a) with all the heads it contains. In this setting, the specific factor controlling the appearance and the disappearance of the augment is going to be *variable root size* (see Caha et al. 2019). This means that different roots can be associated to different sizes of structure in the decomposed AP, because of the arbitrary nature of lexical storage.

Specifically, in order to capture the three classes of adjectives in Table (4), we will distinguish three classes of roots that will differ by the number of heads they are able to spell out. Extra Large roots (henceforth XL-roots) are those of the *old* class: their lexical entry includes the complete structure of the positive degree, as shown in (10a). In the comparative (10b), the XL-root will lexicalise a structure that corresponds to a subtree that is contained in its lexical entry. This follows from the Superset Principle, to be discussed in section 5. The circles represent the structure that the XL-root realises.



Since XL-roots are big, they do not need an augment, neither in the positive, nor in the comparative. These structures therefore give rise to a containment pattern without any augment.

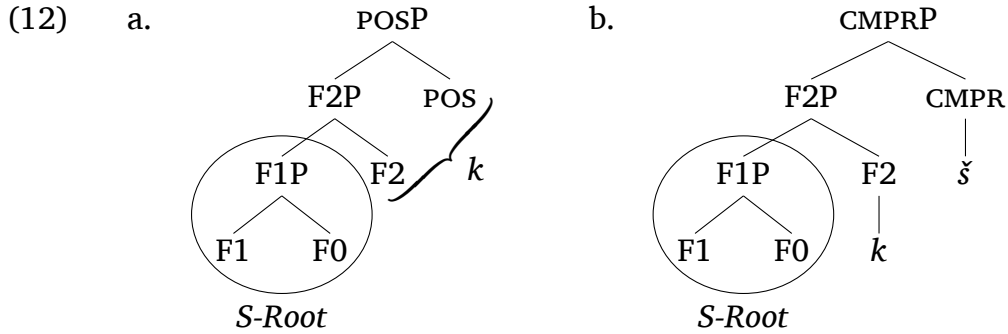
Medium-sized roots (M-roots) are those of the *heavy* class, which featured the problematic truncation pattern in the comparative. Their lexical entry differs from XL-roots in that it lacks the POS head, i.e. their size corresponds to the F2P node. This means that they will not be able to spell out the POS head, and they will therefore need the augment in the positive to spell out POS. There is no need for an augment in the comparative, because the comparative does not include POS; the comparative marker will appear directly on top of the root spelling out F2P. This results in the truncation pattern.<sup>3</sup>



Finally, adjectives of the *slimy* class have Small roots (S-roots). Their lexical entry corresponds to F1P, as shown in (12). In the positive (12a), F2

<sup>3</sup> We shall argue in section 5 that with M-roots in the positive, *k* in fact spells out both F2 and POS. This issue is immaterial to the argument being made here.

and POS will need lexicalisation, and this will be done by the augment.<sup>4</sup> In the comparative (12b), the root alone is likewise insufficient to realise all the features. While the CMPR head is lexicalised by the comparative marker *š*, and the root realises F1P, this still leaves F2 in need of lexicalisation. Because of this, *k* is found also in the comparative with these roots. Therefore, S-roots exhibit a containment pattern, with an augment both in the positive and the comparative.



### 3 The Slovak data

This section discusses the Slovak patterns in more detail. We focus here in particular on those Slovak adjectives that have an augment in the positive degree. As we intend to show, they fall into two subclasses: one drops the augment in the comparative, giving rise to the truncation pattern, whereas the other keeps it, showing the containment pattern. We argue that the distinction between the truncation class and the containment class is an arbitrary property of the root. We do so by showing that the bifurcation cannot be captured by other (phonological, morphological or semantic) means.

To demonstrate this, we give here an exhaustive record of adjectives with the augment *-k* in the positive. Those that show truncation are shown in Table 1, while Table 2 lists those that follow the containment pattern.<sup>5</sup>

<sup>4</sup> To this end, F2 and POS need to form a constituent. How this happens is a matter that we address in section 5.

<sup>5</sup> Unless otherwise noted, the source of the Slovak data is the Slovak Academy of Science webpage <http://slovníky.juls.savba.sk>, where the most authoritative dictionaries of the language are available in an electronically searchable format.



**Table 1:** Slovak complex adjectives which drop *-k-* in the comparative.

POSITIVE			DIMINUTIVE				COMPARATIVE			gloss
root	AUG	AGR	root	DIM	AUG	AGR	root	CMPR	AGR	
l'ah	k	ý	l'ah	un	k	ý	l'ah	š	í	'light'
mäk	k	ý	mäk	un	k	ý	mäk	š	í	'soft'
ten	k	ý	ten	un	k	ý	ten	š	í	'thin'
blíz	k	y	bliz	un	k	ý	bliž	š	í	'close'
úz	k	y	uz	un	k	ý	už	š	í	'narrow'
níz	k	y	niz	un	k	ý	niž	š	í	'low'
krát	k	y	krat	un	k	ý	krat	š	í	'short'
hlad	k	ý	hlad	un	k	ý	hlad	š	í	'smooth'
slad	k	ý	slad	un	k	ý	slad	š	í	'sweet'
vlh	k	ý	vlh	uč	k	ý	vlh	š	í	'wet'
ried	k	y	ried	ulin	k	ý	red	š	í	'thin'
t'až	k	ý					t'až	š	í	'heavy'
krot	k	ý					krot	š	í	'tame'
prud	k	ý					prud	š	í	'steep'

The first column of both tables lists the positive degree, segmented into the root and the augment *-k-*. That *-k-* is indeed an independent morpheme (in both classes) can be demonstrated using diminutive adjectives, which are formed by attaching the diminutive *-un* directly after the root (not after *-k-*). The diminutive forms are in the second column. Not all adjectives have such a diminutive version, and some have a slightly different diminutive marker, but in all cases where the diminutive adjective exists, the diminutive marker intervenes between the root and the augment *-k-*. This shows that the augment is a separate morpheme.<sup>6</sup>

Now the fact that this holds also in the containment class (in Table 2), provides evidence that the base of the positive degree is to be segmented in two parts in this class as well. It is therefore impossible to say that, for instance, the comparative form *heb-k-ejš-í* 'smoother' on the first line in Table 2 exhibits *-k-* in the comparative because the *-k-* is not a suffix to begin with, but a part of the root. The diminutive *heb-un-k-ý* 'smooth' shows that *-k-* is a suffix, yet with this root, it is preserved in the comparative.

<sup>6</sup> Such diminutive adjectives are used when talking to children. The diminutive adjectives listed in the table are the ones we found in the Slovak National Corpus (<https://korpus.sk>). Since we consider it unlikely that the corpus contains all the possible diminutives, the gaps in the table should not necessarily be taken to indicate the absence of the diminutive forms.

**Table 2:** Slovak complex adjectives which keep *-k-* in the comparative.

POSITIVE			DIMINUTIVE				COMPARATIVE				gloss
root	AUG	AGR	root	DIM	AUG	AGR	root	AUG	CMPR	AGR	
heb	k	ý	heb	un	k	ý	heb	k	ejš	í	‘smooth’
sliz	k	ý	sliz	un	k	ý	sliz	k	ejš	í	‘slimy’
kreh	k	ý	kreh	un	k	ý	kreh	k	ejš	í	‘fragile’
brit	k	ý					brit	k	ejš	í	‘sharp’ (humour)
hor	k	ý					hor	k	ejš	í	‘bitter’
hyb	k	ý					hyb	k	ejš	í	‘nimble’
krep	k	ý					krep	k	ejš	í	‘energetic’
mrz	k	ý					mrz	k	ejš	í	‘ugly’
trp	k	ý					trp	k	ejš	í	‘bitter’
syp	k	ý					syp	k	ejš	í	‘loose’ (sand)
váz	k	ý					váz	k	ejš	í	‘sticky’
vrt	k	ý					vrt	k	ejš	í	‘nimble’
vlh	k	ý					vlh	k	ejš	í	‘wet’

The second point we want to make is to discard two possible analyses of the distinction between the containment and the truncation patterns. The first is that the distinction is to be explained in phonological terms, e.g., that *-k* drops after roots with a particular phonological shape. The second possibility we want to discard is that the difference between truncation and containment is semantic in nature, e.g., that adjectives with particular semantic properties keep the augment, while other types drop it.

A phonological analysis is made unlikely by the existence of such minimal pairs as the ones in Table 3, where the members of each pair present similar phonological environments, yet behave differently with respect to the choice for truncation or containment in the comparative. Thus the first two roots end in *h*, whereas the latter two end in *t*, the final consonant in either case being preceded by a vowel. Yet the former member of the pair shows truncation, the latter containment, suggesting that the distribution of the augment in the comparative is not determined by phonological factors.

Another possibility would be that the distribution of *-k* (including the distinction between the containment and the truncation pattern) is determined by the abstract meaning of the adjective. Following this avenue, we find that there is indeed a semantic regularity that unifies all adjectives with *-k*. In particular, as we shall discuss in more detail below, all adjectives with *-k* are scalar. What we mean by this is that adjectives with *-k*

**Table 3:** Similar phonological environments, different comparatives.

POSITIVE			DIMINUTIVE				COMPARATIVE				gloss
root	AUG	AGR	root	DIM	AUG	AGR	root	AUG	CMPR	AGR	
l'ah	k	ý	l'ah	<b>un</b>	k	ý	l'ah		š	í	‘light’
kreh	k	ý	kreh	<b>un</b>	k	ý	kreh	k	<b>ejš</b>	í	‘fragile’
krot	k	ý					krot		š	í	‘tame’
brit	k	ý					brit	k	<b>ejš</b>	í	‘sharp’ (humor)

are gradable, tend to have antonyms and their interpretation is context-dependent. For example, the adjective *l'ah-k-ý* 'light,' seen in Table 3, has a synthetic comparative, it has an antonym (*ťaz-k-ý* 'heavy'), and its meaning is context-dependent: *a light/heavy handbag* has a different comparison class (and consequently a different meaning) than *a light/heavy truck*.

At the same time, the relationship between scalarity and morphology is imperfect. To show that, we list a representative sample of adjectives with the augment *-k* in the first column of Table 4. The first thing we want to focus on are their antonyms (horizontally in the same row).

**Table 4:** Semantic category does not predict distribution of *-k*.

K-ADJECTIVE				ANTONYM			
1.	ťaž	k ý	‘heavy’	ľah	k ý	‘light’	truncation
2.	krát	k y	‘short’	dlh	ý	‘long’	
3.	mäk	k ý	‘soft’	tvrd	ý	‘hard’	
4.	vlh	k ý	‘wet’	such	ý	‘dry’	
5.	slad	k ý	‘sweet’	—			
6.	kreh	k ý	‘fragile’	pev	n ý	‘firm’	containment
7.	brit	k ý	‘sharp’	tup	ý	‘blunt’	
8.	heb	k ý	‘smooth’	hrub	ý	‘rough’	
9.	sliz	k ý	‘slimy’	—			
10.	hor	k ý	‘bitter’	—			

What we see is that most of the time, the antonyms lack the augment despite the fact that they too are gradable, context-dependent and have an antonym. Hence we must conclude that the correlation between *-k* and

scalarity is only a one way implication: *-k* entails scalarity, but scalarity does not necessarily lead to *-k*.<sup>7</sup>

Let us now turn to the division between truncation and containment, represented in the table by the horizontal line in the middle. The specific question we address is whether scale structure can be made responsible for the bifurcation between the two patterns. It turns out that it cannot. To show that, we have selected the adjectives in the first column from different sub-classes of scalar adjectives. Consider, for instance, the adjectives ‘heavy’ (line 1) and ‘short’ (line 2), both belonging in the truncation class. They represent the so-called open-scale adjectives in the terminology of Kennedy & McNally (2005). Both have antonyms and both are context-dependent (a short giraffe is a different kind of short than a short grasshopper). However, they differ in that ‘heavy’ is associated with the positive extent on the scale, while ‘short’ is a negative adjective (cf. *How heavy/#short is he?*). This shows that the augment *-k* is not associated to adjectives of a particular direction (positive or negative), and that both positive and negative adjectives may exhibit the truncation pattern.

A similar state of affairs is found in the containment class (below the line). The adjective *kreh-k-ý* ‘fragile’ is a negative adjective with an open scale, while *brit-k-ý* ‘sharp’ is a positive open-scale adjective. The important conclusion is that both positive and negative open-scale adjectives may exhibit or fail to exhibit *k* in the positive degree, and may belong to either the truncation or the containment class in the comparative.

The adjective *vlh-k-ý* ‘wet’ on line 4 is a so-called minimum standard adjective (in the terminology by Kennedy & McNally 2005): it suffices that an object (like a chair) has a minimum amount of wetness for it to count as (*a*) *wet (chair)*. Another distinguishing property is that the comparative entails the positive: if *A is wetter than B*, it follows that *A is wet*. This is not the case for the open scale adjectives on line 1 and 2: for example, *A is heavier than B* does not entail that *A is heavy*. Despite the difference in scalar structure between ‘wet’ and ‘heavy,’ they both belong in the truncation class.

Moreover, we find minimum standard adjectives (associated to partially closed scales) in the containment class as well. To see that, consider the adjective *sliz-k-ý* ‘slim-y,’ which behaves semantically like ‘wet’: if *A is slimmer than B*, it entails that *A is slimy*. The main difference with *wet* seems to be the viscosity of the material rather than the type of scale. Despite the

<sup>7</sup> The adjective *pev-n-ý* ‘firm’ has a different type of augment in the antonym, a matter that we do not discuss further here, since this is orthogonal to our concerns.

fact that ‘slimy’ has abstractly the same type of scale as ‘wet,’ they pattern differently in the comparative.

Finally, lines 5 and 10 show two instances of taste adjectives. These adjectives do not have antonyms: being sweet does not, for instance, entail not being bitter (consider caramelised sugar). However, they are context dependent: *a sweet beer* is a different type of *sweet* than *a sweet cake*; a cake with the same degree of sweetness as beer would not count as sweet. The main point is, however, that one of the taste adjectives (‘sweet’) belongs in the truncation class, the other (‘bitter’) belongs in the containment class. So once again, it seems that the type of scale or even the type of an adjective do not, as far as we can see, allow us to distinguish what kind of morphological pattern the relevant adjective will show. The bifurcation between containment and truncation thus seems to be then best understood as an arbitrary property of the relevant root. This fact is reflected in our analysis sketched above, which relies on a lexically arbitrary property of the root, namely its size in the lexicon.

Summarising this section, we have seen that Slovak has complex adjectives in the positive, which are built up according to the template in (13):

(13) root-K-AGR

Such adjectives either drop the augment *-k* in the comparative, or they keep it. We have shown that this bifurcation is in large part arbitrary, and cannot be predicted on the basis of phonology or semantics. While we did note that the adjectives with the augment are scalar, their scalar properties do not determine the particular pattern they belong in. It should also be noted that the appearance of an augment with a particular root is also in part arbitrary, simply because not all scalar adjectives have an augment, as becomes clear from observing the antonyms in Table 4.

Our goal in the next section will be to model this behaviour in nanosyntax. One of the things that our analysis aims to achieve is to formulate our analysis without invoking context sensitive rules. These rules are a type of a device that models allomorphy as a competition between an unmarked exponent, and an exponent that only appears in the context of a particular root. A possible analysis of the augment using this type of device is depicted below:

- (14) a.  $F^x \Leftrightarrow \emptyset$   
 b.  $F^x \Leftrightarrow -k / \text{ \_\_\_\_\_\_ } \{ \sqrt{\text{HEAVY}}, \dots, \sqrt{\text{SLIMY}}, \dots \}$

What the rules say is that there is a functional head in the extended projection of scalar adjectives, call it  $F^x$ , that is generally left unexpressed (14a), but receives an overt realisation (as *-k*) in the context of the relevant set of roots (this is what (14b) says).

The challenge for such rules is how one should distinguish between the containment and the truncation class. In particular, in order to achieve the disappearance of the augment *-k* with the truncating adjectives in the comparative, the rule in (14b) will somehow have to be deactivated for the roots of the ‘heavy’ class in the context of a higher CMPR head. While this can certainly be achieved (e.g. by a rule of impoverishment, or an additional zero exponent), we do not find such a style of solution attractive.

Rather, we will try to formulate our analysis in terms of a theory where lexical items may differ as to what features are contained in the constituent they spell out. This seems to be an indispensable point of variation; it would be hard to imagine a language where all lexical items have the same specification. We want to show that within nanosyntax, such an analysis is not only possible, but in fact leads to interesting predictions for root suppletion, to be discussed in section 6.

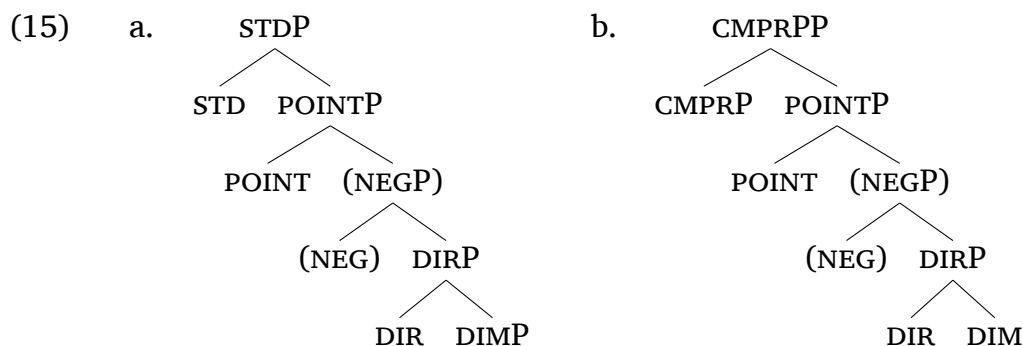
## 4 Decomposing the adjective

As the first step in our analysis, we provide labels for the abstract features F0, F1, and F2, which we have been assuming in Section 2 as an important part of our preliminary analysis. In general terms, these features correspond to independently needed ingredients of gradable adjectives. At the bottom of the hierarchy, there is a dimension, which could be size, velocity, height, color, material, etc. This means that  $F0 = \text{DIM}$ . Some dimensions are nonscalar (e.g. *wooden*, *blue*), and these correspond to adjectives that spell out just the feature DIM. Scalar adjectives come with an ordering on top of a dimension, which we represent by the feature DIR, i.e.  $F1 = \text{DIR}$ . Directions may be reversed by means of an optional reversal operator (called NEG in De Clercq & Vanden Wyngaerd 2019). The presence or absence of NEG distinguishes antonymic pairs of adjectives from one another (like *tall-short*, *wet-dry*, *heavy-light*, etc.). Such adjectives thus involve the same dimension, but the direction of the scale is different: positive for *tall*, negative for *short* (see De Clercq & Vanden Wyngaerd 2018 for a semantic analysis of this contrast).

This leaves us with F2 to provide a label for. We shall assume that F2 basically introduces a point on the scale, and we therefore label it as POINT.

This point will divide the scale into two parts, one which exceeds this point and another one, which does not. The argument that the adjective is predicated of will have a degree of the relevant property that falls within the part of the scale that exceeds the relevant POINT. The projection POINT is ‘underspecified;’ it does not introduce any specific point, but rather the fact that there is a point to begin with. The precise position and nature of this POINT on the scale will then be further specified by additional functional material. In the positive degree, the relevant point corresponds to the contextual standard (STD), a term that replaces the label POS we have been using in Section 2. Putting all of this together, we arrive at the structure in (15a) for positive, with the optional NEG feature in brackets.

In the comparative, the relevant POINT on the scale (which the argument the comparative is predicated of must exceed) is provided by the standard of comparison in the *than*-phrase, and so for the time being, we shall maintain the head CMPP in the structure as a way of saying that the value of the POINT will be provided by the *than*-phrase, possibly (but not necessarily) located in the Spec of this projection. The structure of the comparative then looks like (15b).



With these labels in place, the informal analysis given in section 2 above in essence remains the same. The distribution of the augment *k* can be explained in terms of different root sizes of the three different classes of adjectives. XL-roots can pronounce the entire structure in (15a), as well as the POINT P subtree that is found in the comparative. With this class of adjectives, no augment is present in either the positive or the comparative.

At the other extreme, S-roots are of size DIR P (or NEG P, if they are negative). As a consequence, they need the augment *k* in both the positive and the comparative. The augment helps them spell out the part of the sequence which they themselves are unable to spell out. In the positive, these are the heads POINT + STD, two heads which we take to be the lexical specification



of the augment. In the comparative of S-roots, *-š* spells out CMPRP, the S-root spells out all the projections up to DIR/NEG, and *-k* is still needed to spell out the POINT projection.

Note further that such a specification of the augment derives the fact that *-k* only appears with gradable adjectives, because it spells out projections that are irrelevant for non-gradable adjectives (these have only DIM). Further, the lexical entry of the augment *k* predicts that the augment will be able to come on top of both positive and negative adjectives, a prediction which is confirmed by the existence of antonymic pairs of adjectives like *taž-k-ý* ‘heavy’ vs *lah-k-ý* ‘light’, which both have *k*. The relevant roots spell out DIM + DIR and DIM + DIR + NEG respectively, while *-k* spells out POINT + STD.

Finally, M-roots are of size POINTP. This means that the augment is needed in the positive, but will disappear in the comparative, since the comparative head comes directly on top of POINTP.

It is worth mentioning explicitly that there is no  $\sqrt{\phantom{x}}$  node at the bottom of the tree, which thus consists of functional heads ‘all the way down.’ This means that on our approach, roots like *nice*, *kind*, *good*, *prett-*, etc. are not acategorical, but spell out functional heads (an approach pioneered for verbs by Ramchand 2008). On this approach, the way roots differ from functional morphemes is not in the type of a head that they spell out. Rather, roots are understood as lexical items that are associated to a concept in their lexical entry, while functional morphemes are not. The meaning of the latter consists solely of the grammatically relevant meaning (functional heads) that they spell out. When a root is inserted during spellout as the realisation of a particular set of functional heads, the associated concept is activated in the conceptual representation. The model of spellout we shall be assuming is the topic of the next section.

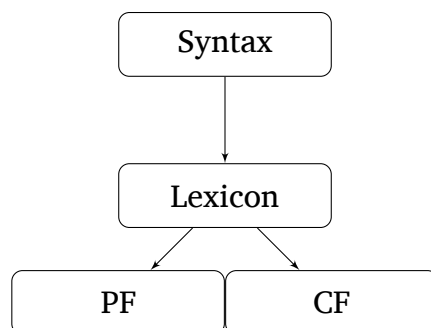
## 5 The formal derivation

### 5.1 Prerequisites

The analysis we shall present is couched in the framework of nanosyntax, a late-insertion model that has a postsyntactic lexicon, and a syntax where each feature is a syntactic head (Starke 2009; Caha 2009). The model is represented schematically in Figure 1.

The syntax creates syntactically well-formed objects, which are then matched against the lexicon for pronunciation. The lexicon plays the role

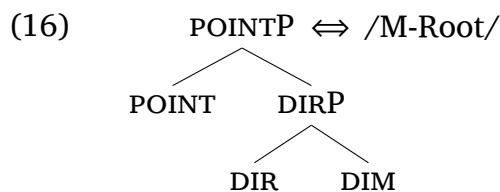




**Figure 1:** Nanosyntactic model of grammar.

of a translator between the syntactic representation on the one hand and phonology and concepts on the other. For content words, a lexical item links a syntactically well-formed tree with a well-formed phonological object at PF and a concept at CF (Starke 2014). Functional words only map syntax onto pronunciation at PF, but do not contribute any additional conceptual meaning beyond the one contributed by the set of functional heads the functional morpheme spells out. A model of spellout based on these assumptions leads to a restricted lexicon, in the sense that only well-formed syntactic trees (rather than any haphazard set of features) can be linked to a phonology and/or concept inside a lexical entry.

A crucial part of this model is the idea that linking syntactically well-formed objects to phonology is not restricted to terminals. Since phrases containing multiple terminals are also well-formed syntactic objects, they may be easily pronounced by a single piece of phonology (a single morpheme in the traditional sense), provided these terminals form a constituent (i.e. a syntactic object). An example is provided below by the entry for an M-root:



Whether a particular syntactic tree is matched by a lexical item is determined by the Superset Principle (Starke 2009):

(17) *The Superset Principle*

A lexically stored tree L matches a syntactic node S iff L contains the syntactic tree dominated by S as a subtree.

As a consequence of the Superset Principle, the M-root entry given in (16) is also applicable as the spellout of a DIRP in (18), since such a DIRP is contained inside the lexically stored tree.

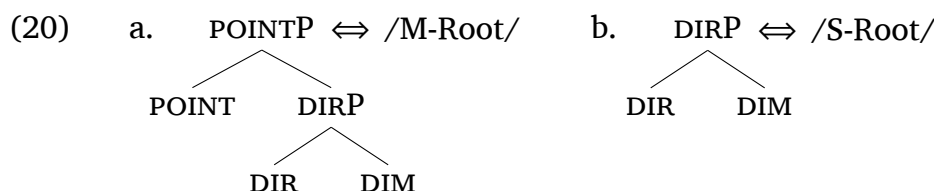


Recall now that roots come in various sizes. Therefore, it will sometimes be the case that multiple roots of different sizes match a particular structure. We shall be assuming that in such cases, there is Free Choice, and we may insert the lexical item that we ‘want to talk about.’

(19) *Free Choice of the root*

When several roots match, the choice among them is free.

To see how this works, consider the lexical items in (20), where (20a) represents an M-root and (20b) an S-root:



If syntax produces a DIRP, then both of these roots are candidates. This follows from the Superset Principle, since DIRP is contained in both entries. What we do not want to happen is that some version of the Elsewhere Condition forces the insertion of the S-root on the grounds that it is a ‘perfect match,’ since that would in effect prevent L-roots from being usable as the spellout of DIRP at all. The problem with this would be that a set of concepts (associated to L-roots) would not be available at all in the given context, an unwanted consequence. In order not to run into a problem like this, we simply avoid postulating the Elsewhere Condition (or a ‘Best-Match Condition’) for roots. As a simple result of not having the Elsewhere Condition, the principle of Free Choice in (19) emerges. We leave it open as to whether the Elsewhere Condition is needed for the competition of functional morphemes. In the present context, we will not need to assume any

such principle, because there will always be a unique functional morpheme as the spellout for a particular piece of structure (see [Caha et al. 2019](#) for a discussion).

Moving on to additional assumptions, we adopt here the cyclic spellout algorithm described in [Starke \(2018\)](#). The gist of the algorithm is that structure building (Merge F) is intertwined with spellout, such that spellout applies after each application of Merge F. The way spellout applies is by targeting the FP (i.e. the topmost node) that has just been created by Merge F. The algorithm is phrased in such a way that the spellout of FP must actually succeed for Merge F to continue further. The simplest way for spellout to succeed is by finding a matching item for the whole FP. However, if that fails, the structure is rejected at the interface and returned to syntax. In order to save the structure, syntax must perform certain rescue operations, movement in particular. The movements happen in a pre-defined order, first trying to remove the Spec of FP out of FP, and then checking again if this helps with finding a spellout for the FP. The last step is moving the complement. These successive steps in the spellout algorithm are formulated in (21).

- (21) Merge F and
- a. Spell out FP
  - b. If (a) fails, attempt movement of the spec of the complement of F, and retry (a)
  - c. If (b) fails, move the complement of F, and retry (a)

It is important to stress that ‘Spell out FP’ in (21a) does not equal ‘Pronounce FP.’ Spellout can be intuitively understood as ‘finding a match’ in the lexicon. When a matching item is found, this is enough for Merge F to proceed, with actual pronunciation postponed.

Keeping this in mind, consider how cyclic derivations proceed. Suppose that syntax constructs FP and spells it out, i.e. it finds a match in the lexicon. The derivation then continues by another step of Merge F, e.g., by merging F2 with FP, producing the constituent [<sub>F2P</sub> F2 FP ]. At this point, spellout applies again. Suppose that a matching item for the full F2P is found. This will lead to the previous match (at FP) being forgotten, and only the highest match survives. This is known as the principle of Cyclic Override:

- (22) *Cyclic Override*  
Lexicalisation at a node XP overrides any previous match at a phrase contained in XP.

However, (22) should not be considered a principle on its own, but rather a consequence of the architecture where spellout cyclically targets higher and higher nodes.

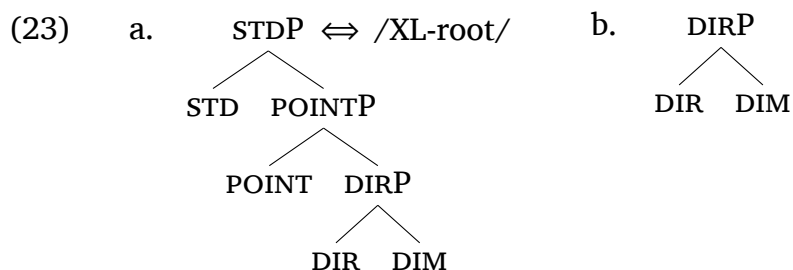
An important qualification as to how this principle is applied pertains again to roots. In particular, once a particular root is chosen, this choice remains in place for the rest of the derivation (see [Caha et al. 2019](#) for discussion). For example, a root like ‘heavy’ cannot override a root like ‘slimy,’ as such a move would be irrecoverable.

The final tool in our spellout toolbox is backtracking, which is a last resort operation that is activated when the derivation gets stuck following the algorithm described above. We will say more about backtracking at the relevant place in the discussion.

We shall illustrate the workings of the above mechanisms and principles as we proceed. While doing so, we demonstrate that the correct pairing of roots and augments, as well as their correct ordering, can be derived using the tools described above.

## 5.2 The positive degree

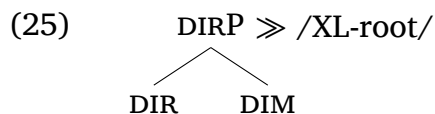
We start by considering the derivation of the positive degree of an XL-root (e.g. ‘old’). These lack augments both in the positive and in the comparative (recall (4)). An XL-root has a lexical entry like (23a). In the first step, the syntax merges DIRP as in (23b).



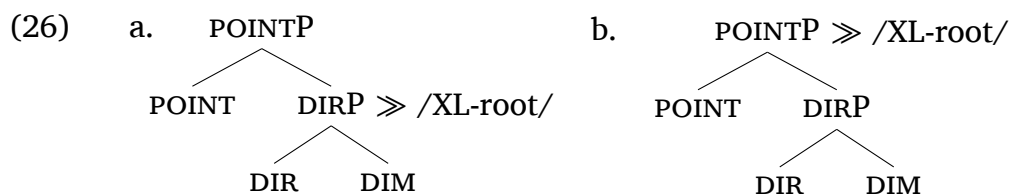
Recall now that the way the syntax interfaces with the lexicon is via the Spellout Algorithm, which we repeat in (24).

- (24) Merge F and
- a. Spell out FP
  - b. If (a) fails, attempt movement of the Spec of the complement of F, and retry (a)
  - c. If (b) fails, move the complement of F, and retry (a)

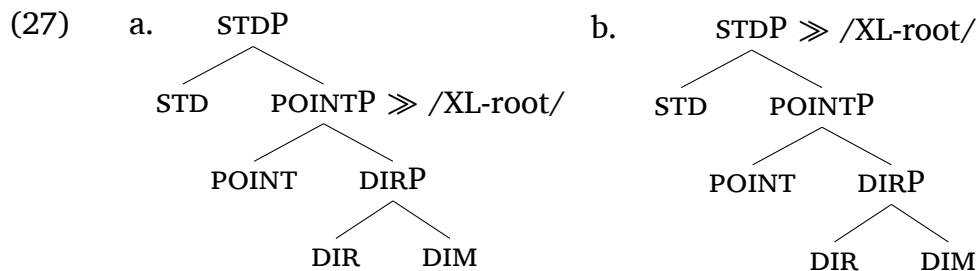
According to (24), the first thing we should do is try the spellout of DIRP without any movement (24a). Since DIRP is contained in the lexical tree of the XL-root, the XL-root can spell out DIRP. We indicate successful spellout with the  $\gg$  sign:



In the next step of the derivation, POINT will be merged on top of DIRP, producing POINTP as in (26a). The spellout algorithm is cyclic, and the lexicon will therefore be consulted again in an attempt to spell out the newly formed POINTP. A match will be found in the same XL-root, so that spellout at POINTP is successful, and it will override the earlier spellout at DIRP, as shown in (26b).

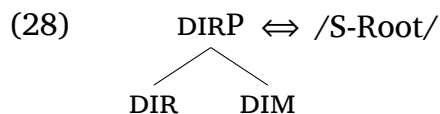


The same procedure will be repeated one more time, producing the whole STDP (corresponding to the positive degree), which is still spelled out as the XL-root.

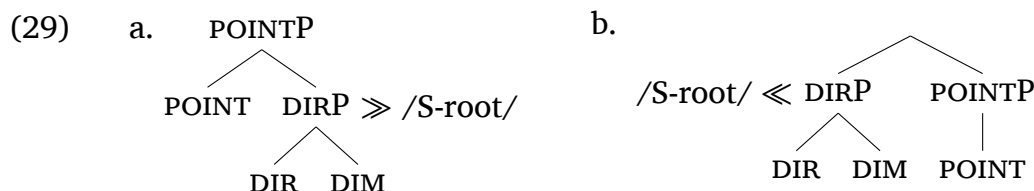


Derivations with augments in the positive work similarly in the initial stages, but they differ in that at some intermediate point in the derivation, the application of Merge F will result in a tree that is no longer contained in the lexical tree of the relevant root, i.e., the syntactic tree will become too big to be realised by the root. As a result, spellout will fail, and rescue strategies will be applied.

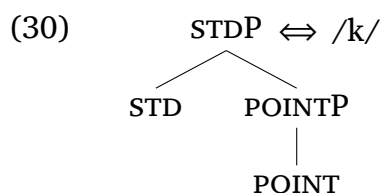
Let us see in more detail how this works with an S-root like *sliz-* ‘slime’ in *sliz-k-ý* ‘slimy’. An S-root has a lexical entry of the size DIRP, as shown in (20b) above, repeated below for convenience.



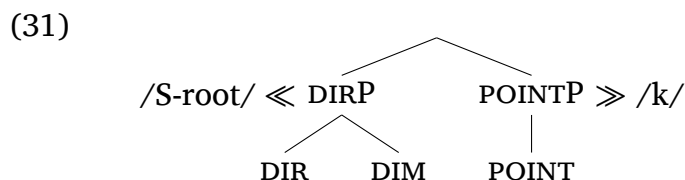
On the first step of the derivation, when DIR and DIM are merged, an S-root can spell out this constituent. However, if POINT is merged to DIRP, creating a POINTP shown in (29a), direct spellout fails. This is because the lexical tree of an S-root like *sliz-* no longer contains the syntactic tree. The first rescue strategy that should be tried is the movement of the Spec of the complement of POINT (see (24b)), but since the complement has no Spec, this option is undefined. That leads to complement movement, as mandated by (24c), yielding (29b).



At this point, the lexicon will again be consulted, and it will find a match for POINTP in the augment *k*, whose lexical entry is given in (30). Recall that the specification of *-k* has already been discussed in an informal way in relation to the trees in (12a) and (15) above.



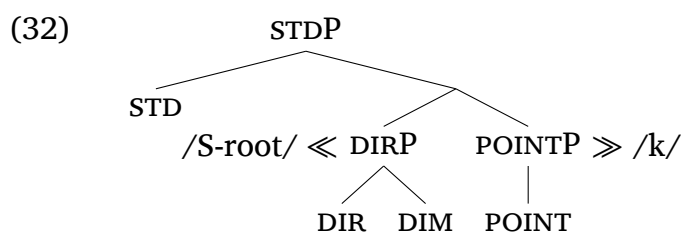
Observe that the syntactic tree POINTP of (29b) is contained in (30) as a subtree, so that spellout can occur:



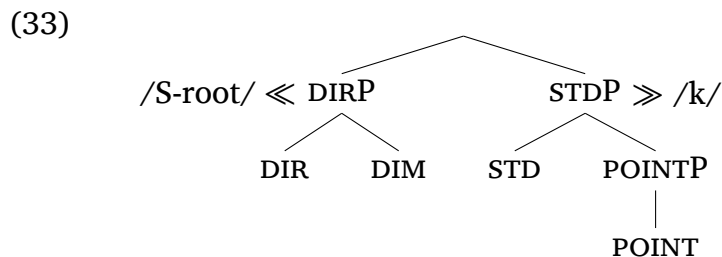
Observe further that at this point, the underlying structure has been rearranged in a way that the correct linear order of the root and the suffix is derived.

Note also that spellout movement has simply removed the DIRP out of the POINTP, leaving no trace behind. This allows us to keep the spellout procedure matching syntactic trees with lexical ones maximally simple (Starke 2018). We adopt this convention here, while noting that it is not crucial for the system to work; the alternative would be for spellout to simply ignore such traces.

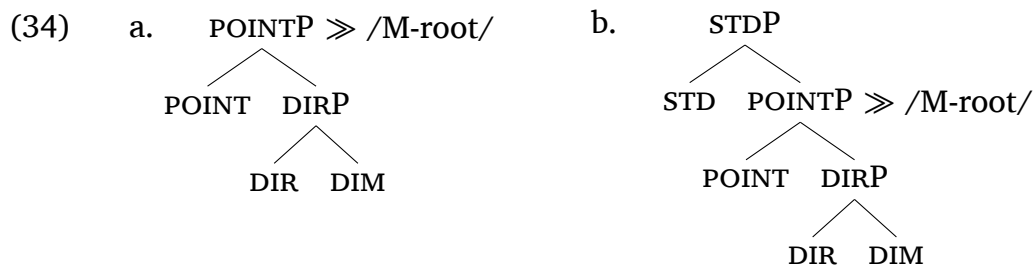
The derivation now continues to merge STDP, producing (32):



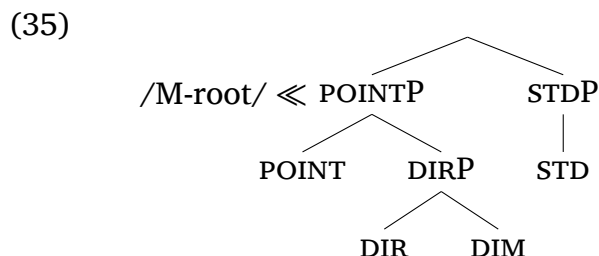
No lexical entry will match the structure, and movement of the Spec of the complement of STD will apply. This will move the DIRP out of STDP. This derives, as the right hand member of the tree, a STDP that is identical to the lexical entry of *-k* in (31), so that spellout as *-k* takes places, overriding the earlier spellout of POINTP by the same *-k*.



The derivation of the positive degree of M-roots is the most technically complex. To see why, consider first their lexical entry given in (20a). This entry will initially allow for a derivation where we merge features and spell out without movement, ultimately reaching the stage where POINTP is spelled out by the root, which exhausts its lexicalisation potential; see (34a). Once POINTP is spelled out by the root, the next feature (STD) is merged, yielding (34b).



Since the M-root cannot spell out (34b), rescue movements take place. The complement of STD has no Spec, so the movement of the complement of STD will apply, yielding (35):



But now the right hand part of the tree (35), i.e., the STD P, cannot be realised by the augment, since the STD P of (35) it is not a subtree of the augment's entry (30). In fact, there is no lexical entry in the Slovak lexicon that can apply to this structure, which leads to spellout getting stuck: no rescue operation produces a lexicalisable output, and Merge F cannot continue.

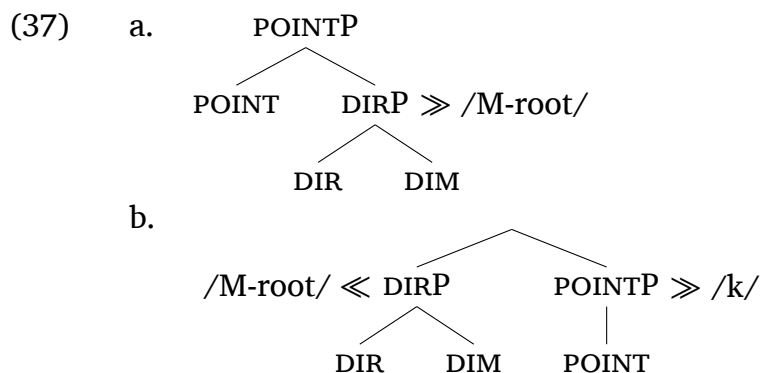
The way we get the correct derivation with the augment has to be one where *-k* spells out STD P. Given the Superset Principle, this implies that *-k* must also spell out POINT (since POINT is included in STD P in the lexical tree of *-k*; see (30)). This in turn means that we must not have POINT spelled out by the M-root, even though it can do so in principle. The way we achieve this result is by literally backtracking, i.e. undoing the previous Merge operation and going back one stage in the derivation to the point where spellout was still working fine, and try some other derivational option. This is formulated in (36):

- (36) *Backtracking*  
 When spellout fails, go back to the previous cycle, and try the next option for that cycle.

Reverting to the previous cycle brings us to the merger of POINTP, as in (37a). At the first pass through this cycle (34a), we have directly spelled out POINTP by the M-root (the first option of the spellout algorithm (24)).



However, this has led to a dead end, so (36) instructs us to try the next option. This would be movement of the Spec of the complement of POINT, but since this is undefined, we end up with the third option of (24), namely complement movement. This leads to the structure in (37b), which contains a lexicalisable POINTP, since it is contained in the lexical item (30), and can be therefore be spelled out as *-k*.

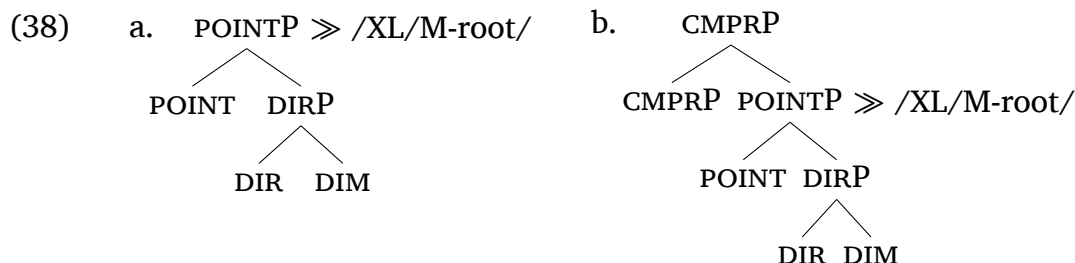


At this point, the derivation can proceed by merging STD, which fails to spell out as in (32). From there, we again move the DIRP out of STDP, by Spec movement, eventually yielding a structure which is identical to that of the S-root in (33) above, except that DIRP is spelled out by the M-root. The positive degree of an S-root and an M-root therefore end up identical, even though their root sizes are different. The difference between both types of roots will appear in the comparative.

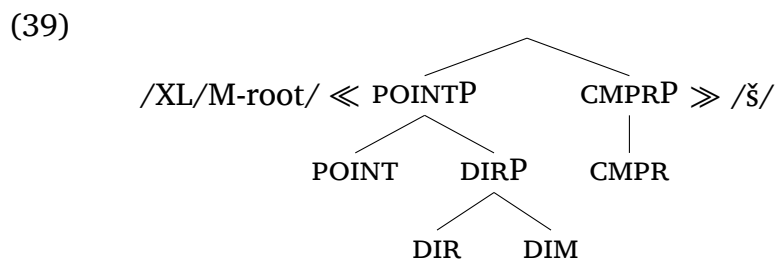
To sum up, we have seen in this section how the derivation of the positive degree adjective proceeds such that only XL-roots lack AUG. Both M-roots and S-roots need one.

### 5.3 The comparative

The derivation of the comparative of XL-roots and M-roots proceeds by the same basic mechanisms. Both recursively Merge F and spell out without movement up to POINTP, see (38a), after which CMPRP is merged, see (38b).

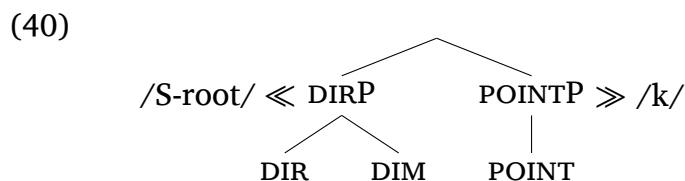


Since the lexicon contains no roots of this size, rescue movement must be applied, and this will move the complement of CMPR to the left, giving rise to (39). The right hand branch of this tree will match with the lexical entry for the comparative suffix, so that spellout is successful, and the correct linear order is derived.

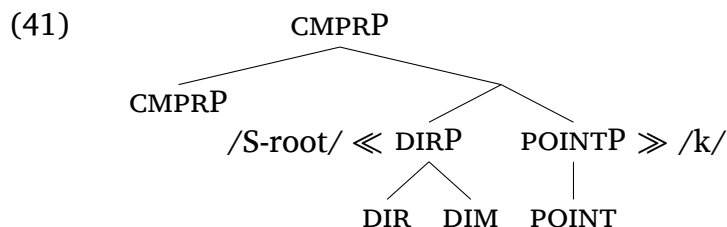


This is in essence how the problematic truncation pattern is derived: M-roots are not large enough to spell out the positive degree (since they lack STD in their lexical entry), and so they will need an augment in the positive. But since the comparative is built in a symmetric structure by adding CMPR on top of POINTP, and since M-roots can spell out POINTP, no augment is needed in the comparative.

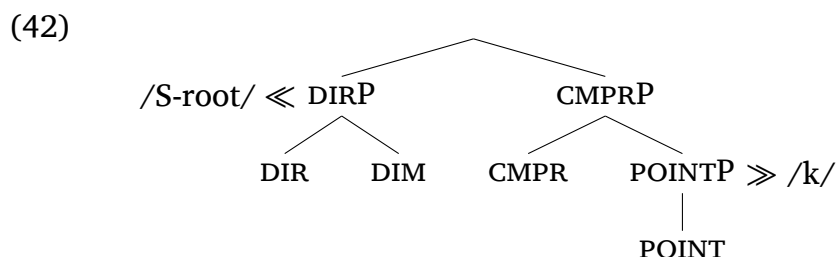
With S-roots, the derivation proceeds exactly as in the positive degree, up to the level of POINTP. This means that rescue movement will have to be applied at the merger of POINTP, causing DIRP to be raised across POINT, leading to the structure in (40) (repeated from (31)).



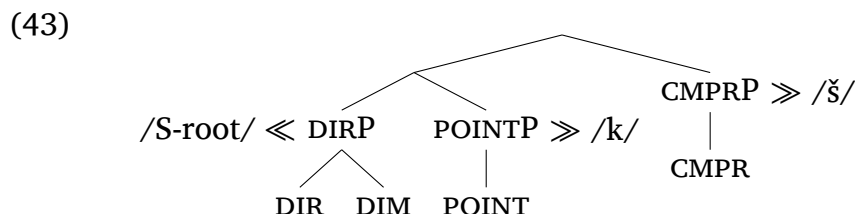
Next, CMPRP will be merged, yielding (41).



(41) does not spell out, so the Spec of its complement (i.e. DIRP) is raised across it, creating (42).



But spellout for CMPRP will fail because no lexical item contains this syntactic tree in the lexically stored tree. We therefore need to undo this movement, revert to (41), and apply the next rescue option of the spellout algorithm, which is movement of the complement of CMPR. This will result in the structure in (43), where CMPR can now spell out successfully as the comparative suffix after the evacuation of its complement.



This leads to the correct result, where the comparative form of S-roots contains the augment. We moreover derive the correct linear order of the suffixes, with the augment appearing between the root and the comparative marker.

This concludes the discussion of the formal derivation of the positive and comparative degrees with the three different root types. We have shown how the derivations unfold on the basis of the different root sizes and the spellout algorithm, deriving the pattern of data discussed in the introduction: with XL-roots there is never any augment, with M-roots there is an

augment in the positive but not in the comparative, whereas with S-roots, there is an augment both in the positive and the comparative.

An essential aspect of our analysis are the non-containment structures we are proposing for the relation between the positive and the comparative. We believe that these are an improvement over any type of approach that would rely on containment structures. It is hard to see how a containment view on the positive and the comparative would be capable of delivering both the truncation pattern and the containment pattern, a result that our approach does achieve.

## 6 Suppletion

We believe that our approach can accommodate earlier results achieved by Bobaljik (2012) pertaining to the absence of ABA patterns in root suppletion in the triplet positive—comparative—superlative. This may come as a surprise, since Bobaljik's observations have traditionally been interpreted as evidence for containment between the positive and the comparative.<sup>8</sup> Upon closer examination, however, it turns out that containment between the positive and the comparative is not needed. We discuss the issues relating to suppletion and symmetric structures in the current section.

### 6.1 \*ABA

Let us first introduce the basic facts. As Bobaljik observes, root suppletion in the triplet positive—comparative—superlative is restricted. In particular, if the comparative is suppletive with respect to the positive degree (as in *good—bett-er*), then the superlative is suppletive as well (i.e., there is no triplet where *good—bett-er* would be followed by *\*good-est*). Bobaljik states this as in (44).

- (44) *The Comparative-Superlative Generalization, part I (CSG1):*  
If the comparative is suppletive, then the superlative is also suppletive.

The same type of generalisation also holds in Slovak, as the following table illustrates. First, in order to get some background on superlatives in Slovak, the topmost line shows a regular adjective where the superlative adds the

<sup>8</sup> As far as we could determine, Bobaljik (2012) remains in part neutral on this issue, though he does draw trees where the comparative contains the positive, see Bobaljik (2012: 32).

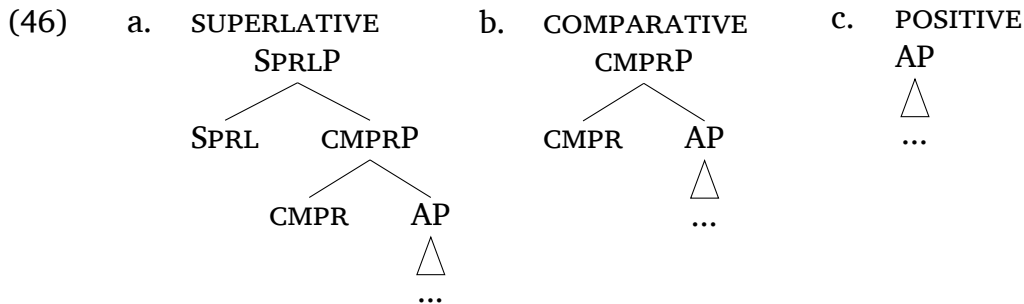
prefix *naj-* to the comparative. This is a typical pattern, found with all comparative—superlative pairs in the language.

(45) Superlatives and the \*ABA in Slovak

POS	CMPR	SPRL	gloss
star-ý	star-š-í	naj-star-š-í	‘old’
dobr-ý	lep-š-í	naj-lep-š-í	‘good’
A-ý	B-š-í	naj-A-š-í	not attested

Against this background, the second line illustrates a suppletive pattern exhibited by the adjective ‘good.’ We see here first of all that the comparative has a suppletive root compared to the positive. The very same suppletive root is found in the superlative, which, as in the regular case, is still derived from the comparative by the prefix *naj-*. Such a pattern of root suppletion is called the ABB pattern by Bobaljik. The final line in the table makes it clear that there is no adjective in the language that would show the ABA pattern, with one root found (A) in the positive and in the superlative, and a different root (B) in the comparative.

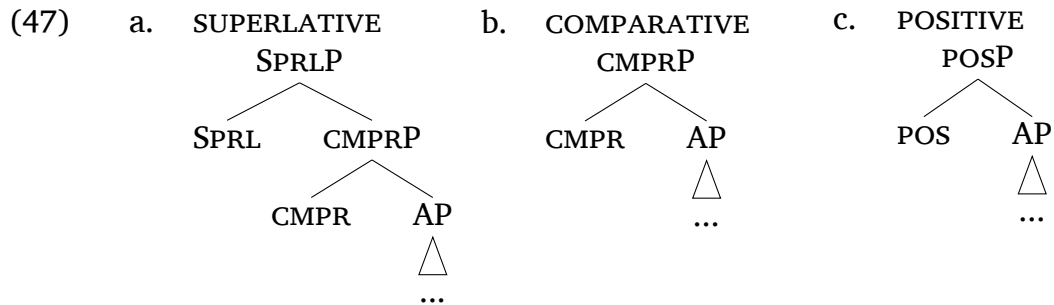
These facts are usually interpreted in terms of structures shown in (46) (as suggested in Bobaljik 2012: 32).



Given these structures, Bobaljik excludes the ABA as follows. Suppose that we have an adjective with one root in the positive (A) and a different one in the comparative (B). For such an adjective, the comparative root B will be made sensitive to the presence of CMPR. The positive root A (with no particular specification) does not get to surface in the comparative, because it is less specific than the dedicated comparative root B. In this setup, it is impossible to insert the non-specific root A in the superlative, since the structure of the superlative contains the factor that triggers the presence of the suppletive root B (CMPR). This makes it impossible to fall back on the default (or elsewhere) root A. The root B will be a better match in the

superlative than the nonspecific root A for exactly the same reasons for which it is a better match in the comparative.

However, note that the very same reasoning can be replicated for the symmetric (or noncontainment) structures we have been proposing here, as long as we stick to the hypothesis that the superlative contains the comparative. A simplified version of such a proposal is shown in (47).



To see how the original reasoning applies, consider it once again. Suppose first that we have a pair of suppletive roots, one in the positive (A) and a different one in the comparative (B). We now face two options to account for the distribution of these roots. The first option is the ‘traditional’ option, which says that the positive root (A) is the elsewhere case, and that the comparative root (B) is sensitive to CMPR. This derives the ABB pattern, and rules out the ABA pattern, for the same reason as before: the structure of the superlative contains the factor triggering the appearance of B. The other option, one that is because of our noncontainment structures, would be to say that the root in the comparative (B) is an elsewhere form, and the root in the positive (A) is triggered by the POS head. Under such a scenario, the POS-specific root A will only appear in the positive, giving rise to an ABB pattern. ABA is ruled out because A is triggered by POS and the superlative does not contain POS. In other words, under both options, \*ABA follows. This means that both the scenario in (46) and the one in (47) are equal in their ability to derive the \*ABA observed by Bobaljik.

We also wish to note that our proposal does not in fact contradict the core of what Bobaljik proposes. Specifically, he clearly states that what is at stake is the containment relation between the comparative and the superlative:

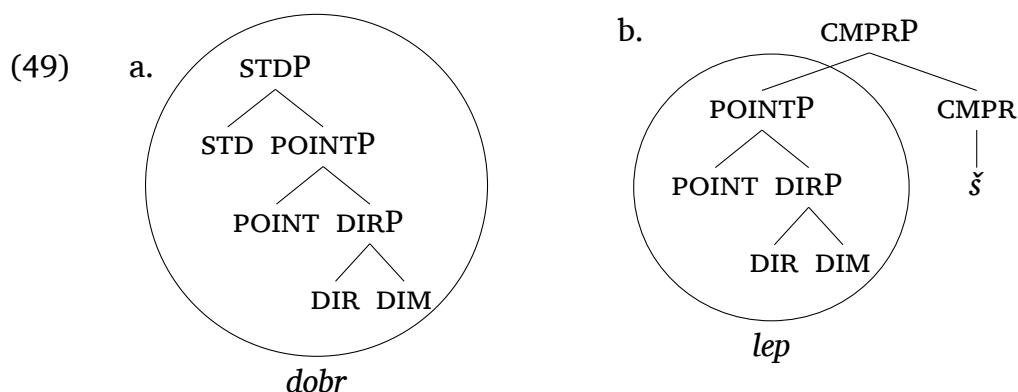
- (48) *The Containment Hypothesis* (Bobaljik 2012: 4):  
 The representation of the superlative properly contains that of the comparative.

This statement is obviously as much in line with our (symmetric) proposal of how to be positive (depicted in (47)) as with the Russian-doll containment structures in (46).

In sum, there seem to be a number of ways how \*ABA patterns may arise in the grammar, as a growing number of works acknowledges (see, e.g., Caha 2017, Bobaljik & Sauerland 2018, Andersson 2018 for how the so-called ‘overlapping’ structures yield \*ABA; cf. Christopoulos & Zompì 2019 for an approach to \*ABA based on symmetric relation between the first two members, like the one suggested here).

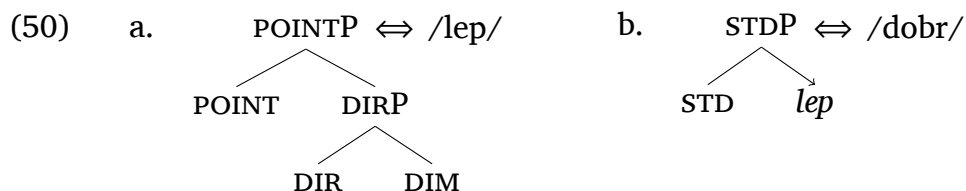
## 6.2 Suppletion as evidence for backtracking

In nanosyntax, suppletion is usually not handled by context-specification, but by phrasal spellout (an option that is used in other approaches as well). To see how this works, consider, for instance, the suppletive relation between *dobr-ý* ‘good’ and *lep-š-í* ‘better.’ The starting point of our discussion is the fact that the positive degree *dobr-ý* ‘good’ has no augment, and therefore, the root *dobr* must spell out a structure of the size STDP. This is shown in (49a). The root *lep* has no augment either, and it therefore spells out the whole constituent that augment-less roots in the comparative spell out, i.e. POINTP. This is shown in (49b).



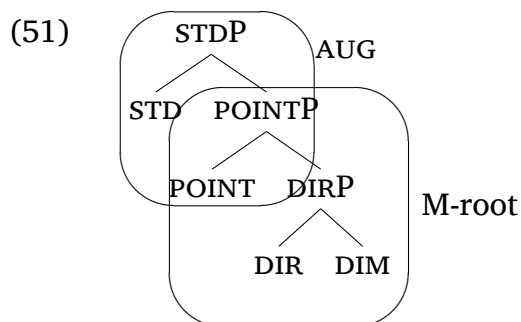
The interesting fact that can be observed in these structures is that we do not need context specification to express the distribution of these roots, because they are already differentiated by the size of the structure they spell out. Specifically, we may easily express their difference by storing the root *lep* ‘bett’ as a lexical item of the size POINTP (an M-root), as in (50a). The root *dobr* ‘good’ is of a different size, namely STDP (an XL-root). However, *dobr* differs from standard XL-roots in that it is the positive degree version of *lep*.

An ordinary XL-root like ‘old’ does not stand in a suppletive relationship to another root. The way this special relationship of *dobr* to *lep* is expressed in nanosyntax is by using the so-called pointer (Starke 2014, Caha et al. 2019). In our particular case, the entry of the root *dobr* ‘good’ will say that it is the spellout of a structure that includes the head STD as one of the daughters, and where the other daughter corresponds to a structure that has been spelled out by the lexical item *lep* ‘bett’ at the previous cycle. This is what the lexical entry (50b) says.



A crucial consequence of this approach is that suppletive lexical items always spell out constituents of different size. It is impossible to have one and the same constituent expressed by two roots with one suppletive for the other.

With the basic understanding of suppletion in place, we want to present a piece of empirical support for the backtracking analysis of the M-roots. Recall that these lack the augment in the comparative, but have it in the positive degree. Under the derivation that we developed earlier, M-roots (which are specified for POINTP) do not realise their full lexicalisation potential in the positive, but have to shrink to the same size as S-roots in a backtracking derivation. This is due to the fact that the augment has POINT as its bottom-most feature. There is, in other words, a potential overlap in one feature between the augment (which has POINT at the bottom) and the M-root (which has POINT at the top). This is schematically depicted in (51).



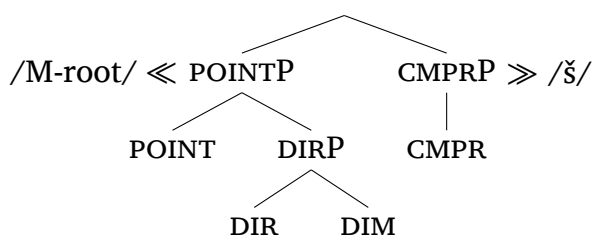
It follows from constituent spellout and the Superset Principle that any lexical item has to realise at least its foot, i.e. its lowest feature, because the



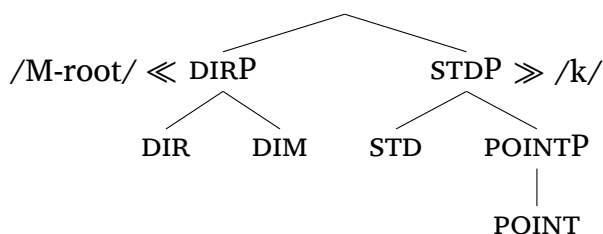
higher features do not form a constituent to the exclusion of the foot. The root, which has POINT at its top, thus needs to ‘shrink’, i.e. it pronounces a smaller structure than it actually could, and a smaller structure than the one it realises in the comparative. This is allowed, because the lower features form a constituent to the exclusion of the topmost feature. Such shrinking of the lower lexical item in case of an overlap has been implemented via Backtracking.

The relevant structures are repeated below for convenience. (52a), repeated from (39), shows the comparative structure of an M-root, while (52b), repeated from (33), shows the structure of the positive where the M-root shrinks to DIRP only.

(52)



(53)



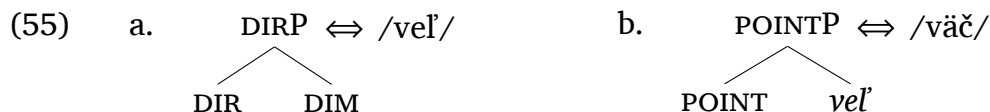
In the context of the theory of suppletion sketched above, this leads to a prediction, namely that this difference in size may be reflected in a formal difference, where an M-sized root (spelling out POINTP and lacking an augment in the comparative) could stand in a suppletive relation to a positive degree root (of the size DIRP), which would then combine with an augment. However, if the derivation did not allow for backtracking, and rather allow for a type of spellout where *-k* can shrink ‘upwards’ to spell out STD only, it would be difficult to square this with a suppletive pair of roots such that the positive one combines with an augment, while the comparative one lacks it.

Slovak provides some evidence that bears out the prediction of the Backtracking derivation. One of the relevant adjectives is the adjective *veľ-k-ý* ‘big’, which loses the augment in the comparative and simultaneously changes to a suppletive root, as shown in (54). There is another adjective

which shows the same behaviour (albeit with a different augment), *pek-n-ý* ‘pretty’ (data from Dvonč et al. 1966).

	POS	CMPR	SPRL	gloss
(54)	<i>veľ-k-ý</i>	<i>väč-š-í</i>	<i>naj-väč-š-í</i>	‘big’
	<i>pek-n-ý</i>	<i>kraj-š-í</i>	<i>naj-kraj-š-í</i>	‘pretty’

These adjectives support our claim that we are dealing with different root sizes in the positive and the comparative, which is predicted only under the backtracking proposal. The lexical items for *veľ*- ‘big, POS’ and *väč*- ‘big, CMPR’ are given below.



A further prediction that we make is that such suppletion will not arise with S-roots, which have an augment in the positive and the comparative and spell out the DIRP in both cases. This prediction is also borne out.

## 7 The semantics of POS

In the semantics literature, a (silent) POS head is often assumed in the positive but not the comparative degree (e.g. Kennedy 2007). Our symmetric structures discussed in the previous sections make the same assumption, albeit on morphological grounds. The question we wish to address in this section is whether *k* can be taken to be a realisation of this semantically motivated POS head (currently represented by the STD head in our proposal). We shall argue that the relationship between the augment and the POS head is not one-to-one, and that consequently the augment *-k* cannot be taken as an instantiation of POS.

The semantic POS head is responsible for the context-sensitivity of gradable adjectives, i.e. the fact that their interpretation depends on a contextual standard or comparison class (cf. Wheeler 1972; Klein 1980, and much subsequent literature). For example, Grano & Davis (2018: 133) provide the following semantics for POS (where *g* is a measure function, and *d<sub>c</sub>* the degree of the contextual standard):

$$(56) \quad \llbracket \text{POS} \rrbracket = \lambda g_{\langle d, \langle e, t \rangle \rangle}. \lambda x. \exists d [g(d)(x) \wedge d > d_c]$$

Applied to an adjective like *tall*, this yields (57):

- (57)  $\llbracket \text{POS} \rrbracket(\llbracket \text{tall} \rrbracket)(\llbracket \text{John} \rrbracket) = \exists d[\mathbf{height}(j) \geq d \wedge d > d_c]$   
 ‘There is some degree  $d$  such that John’s height meets or exceeds  $d$  and  $d$  exceeds a contextually determined threshold  $d_c$ .’

The fact that the comparative lacks this reference to a contextual standard in its semantics is the main argument for assuming that this null degree head POS is restricted to the positive degree, and does not occur in the comparative. As stated earlier, such a semantic analysis agrees well with our symmetric structures given above, which have a STD head in the positive degree but not the comparative.

However, it is clear from the above that the semantic contribution of  $k$  cannot simply be equated with that of the POS head of the semantics literature (with our STD equivalent in relevant respects to the traditional POS). In particular, in the containment class of adjectives,  $k$  also shows up in the comparative, where it lacks the POS semantics of (56). This property of  $k$  can easily be accounted for under the phrasal spellout theory that we assume. In particular, we have claimed that the lexical entry of  $k$  contains both POINT and STD. What that means is that  $-k$  is a marker that spells out either POINT alone (as in the comparative), or POINT and STD/POS (in the positive). There is, in the phrasal spellout theory, no one-to-one relation between syntactic heads and exponents. The STD/POS meaning is carried by the syntactic head, not by the marker, which may be pronouncing different heads in different environments.

Further support for the claim that  $-k$  does not correspond in a one-to-one fashion with semantic POS comes from measure phrases. These may specify an extent, as in *Radek is 1.5m tall*, or ask for one (e.g. *How tall is Radek?*). Adjectives with such measure phrases do not carry positive degree semantics, yet in adjectives that have an augment, they do co-occur with  $-k$ . This is shown in (58):

- (58) a. Aký ťaž-k-ý je tank T-72?  
           how heav-y is tank T-72?  
           ‘How heavy is the T-72 tank?’  
       b. Tank T-72 je ťaž-k-ý 42 ton.  
           tank T-72 is heav-y 42 tons.  
           ‘The T-72 tank is 42 tons heavy.’ [Slovak National Corpus]

This suggests that  $-k$  has further internal structure, and is able to realise extents of various types: a contextual extent (as in (56)), or an extent which is overtly specified, as in (58a), or questioned, as in (58b). This raises intricate questions of the semantics and the distribution of measure phrases,

which we cannot do full justice to in the present context, and which we therefore refer to future research. The take home message from this section is that in the phrasal spellout theory, syntactic heads (or features) provide the semantic atoms, whereas the exponents typically map onto these heads in a one-to-many fashion, i.e. a single exponent typically realises multiple semantic atoms. The quest for a morphological instantiation of the semantic POS head may therefore well turn out to be illusory in the end.

## 8 Conclusion

We have shown that the distribution of the augment *-k* in Slovak adjectives shows a peculiar pattern, which challenges the candidate universal in [Grano & Davis \(2018\)](#) to the effect that the comparative is either identical to or contains the positive degree. We have argued that this pattern can be fruitfully analysed under the root size approach, where allomorph selection, and more specifically the distribution of zeroes (i.e. zero augments in our case), is a function of root size. Under this approach, there are no zero markers under terminal nodes, but instead roots may realise constituents of variable sizes, thus creating the impression of zero realisation of certain heads or features.

The distribution of the augment *-k* in Slovak also required that we postulate symmetric structures, where a common adjectival base is elaborated on in different directions in the positive and the comparative. We also showed how the root size model provides an elegant account of root suppletion, which maintains the \*ABA generalisation of [Bobaljik \(2012\)](#), and which receives some confirmation from suppletive patterns found with certain *k*-adjectives. Finally, we showed how the phrasal spellout model predicts explains the fact that the correlation between the augment *-k* and the semantic atoms of the positive degree is not one-to-one but one-to-many.

## Abbreviations

CMPR = comparative, SPRL = superlative

## Funding information

Pavel Caha's and Michal Starke's work has been supported by grants from the Czech Science Foundation (GAČR), grant no. GA17-10144S and GA19-

07004S, respectively. Karen De Clercq's work was funded by the Flanders Research Foundation (FWO).

## Acknowledgements

The authors wish to thank the audience at GLOW Oslo (2019) for their feedback on the present paper.

## Competing interests

The authors have no competing interests to declare.

## Authors' contributions

The four authors have made an equal contribution to this paper. They are listed in the reverse alphabetical order.

## References

- Andersson, Samuel. 2018. \*ABA in Germanic verbs. *Glossa* 3(1). 119. 1–20.
- Bobaljik, Jonathan. 2012. *Universals in comparative morphology*. Cambridge, MA: MIT Press.
- Bobaljik, Jonathan & Uli Sauerland. 2018. \*ABA and the combinatorics of morphological features. *Glossa* 3(1). 15.1–34.
- Caha, Pavel. 2009. *The nanosyntax of case*. Tromsø: University of Tromsø dissertation.
- Caha, Pavel. 2017. How (not) to derive a \*ABA: the case of Blansitt's generalization. *Glossa* 2. 84.1–32.
- Caha, Pavel, Karen De Clercq & Guido Vanden Wyngaerd. 2019. The fine structure of the comparative. *Studia Linguistica* (<https://doi.org/10.1111/stul.12107>).
- Christopoulos, Christos & Stanislao Zompì. 2019. How to avoid disjunctions in describing Indo-European case-sensitive allomorphy. Handout of a talk at CRAFF, Brno, May 14.
- De Clercq, Karen & Guido Vanden Wyngaerd. 2018. Adjectives and negation: deriving contrariety from contradiction. *Papers of the Linguistic Society of Belgium* 12. 1–19.

- De Clercq, Karen & Guido Vanden Wyngaerd. 2019. Negation and the functional sequence. *Natural Language & Linguistic Theory* 37(2). 425–460.
- Dvonč, Ladislav, Gejza Horák, František Miko, Jozef Mistrík, Ján Oravec, Jozef Ružička & Milan Urbančok. 1966. *Morfológia slovenského jazyka [the morphology of Slovak]*. Bratislava: Vydavateľstvo Slovenskej akadémie vied.
- Grano, Thomas & Stuart Davis. 2018. Universal markedness in gradable adjectives revisited. The morpho-semantics of the positive form in Arabic. *Natural Language & Linguistic Theory* 36(1). 131–147.
- Kennedy, Christopher. 2007. Vagueness and grammar: the semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy* 30. 1–45.
- Kennedy, Christopher & Louise McNally. 2005. Scale structure, degree modification, and the semantics of gradable predicates. *Language* 81. 345–381.
- Klein, Ewan. 1980. A semantics for positive and comparative adjectives. *Linguistics and Philosophy* 4. 1–45.
- Ramchand, Gillian. 2008. *Verb meaning and the lexicon*. Cambridge, Massachusetts: MIT Press.
- Starke, Michal. 2009. Nanosyntax: A short primer to a new approach to language. *Nordlyd* 36. 1–6.
- Starke, Michal. 2014. Cleaning up the lexicon. *Linguistic Analysis* 39. 245–256.
- 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.
- Wheeler, Samuel. 1972. Attributives and their modifiers. *Noûs* 6. 310–334.