

# THE FINE STRUCTURE OF THE COMPARATIVE

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## 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 and English, we show that this proposal explains a range of facts about suppletion, allomorphy and their interaction with negation. 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

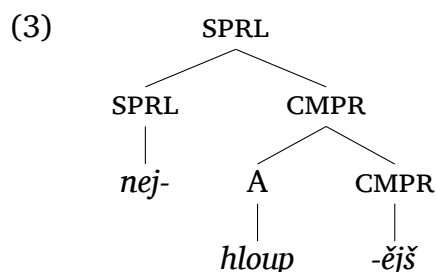
The seminal study of Bobaljik (2012) has put the morphosyntax of degree comparison firmly on the research agenda. Central to his claims is the Containment Hypothesis (Bobaljik 2012:4):

- (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:<sup>1</sup>

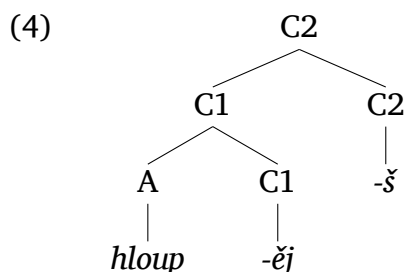
(2)	POS	CMPR	SPRL	
	<i>mil-ý</i>	<i>mil-ejš-í</i>	<i>nej-mil-ejš-í</i>	‘nice/kind’
	<i>červen-ý</i>	<i>červen-ějš-í</i>	<i>nej-červen-ějš-í</i>	‘red’
	<i>hloup-ý</i>	<i>hloup-ějš-í</i>	<i>nej-hloup-ějš-í</i>	‘stupid’
	<i>bujar-ý</i>	<i>bujar-ějš-í</i>	<i>nej-bujar-ějš-í</i>	‘wild’

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 superlative contains the comparative, which in turn contains the positive adjective (A). The direction of branching (and the corresponding order of the heads) is subject to cross-linguistic variation, adjusted below to fit the Czech pattern of *hloup-ějš-í* ‘stupid’:



In this paper, we want to take this proposal a step further and propose (following Caha 2017a,b and De Clercq & Vanden Wyngaerd 2017a) that the CMPR head in the above tree needs to be split up into two distinct heads, as shown in (4):

<sup>1</sup>The grapheme *ě* corresponds to an *e* which triggers the palatalisation of the preceding consonant. In the orthography, *-ějš-* sometimes appears as *-ejš-*, which is a purely orthographic decision as to whether the palatalising effect of *ě* is marked on the vowel (e.g. *ně*) or on the consonant (e.g. *ře*). The bracketed vowels are concord markers.



In section 2, we present evidence for this structure coming from the allomorphy of the comparative markers in Czech. In section 3, we present the details of our theoretical framework (Nanosyntax). In section 4, we extend the analysis developed on the basis of the Czech data to English comparatives. In section 5, we turn to suppletion and show how the bi-partite structure explains the interaction between various allomorphs of the comparative and root suppletion. Section 7 adds negation into the picture, and argues that negation introduces a Neg head in the functional structure, which is capable of blocking suppletion. We also observe contrasting behaviour between English and Czech concerning bracketing paradoxes, and we relate this to the independently observed difference in comparative allomorphy as observed in sections 2 and 4.

## 2 Allomorphy of the Czech comparative

### 2.1 The three allomorphs

As we have shown in (2) above, the Czech comparative can be formed by suffixing *-ějš-* to the root. We repeat the table below (slightly extended):

(5)

POS	CMPR	
mil-ý	mil-ejš-í	‘nice/kind’
kulat-ý	kulat-ějš-í	‘round’
hloup-ý	hloup-ějš-í	‘stupid’
bujar-ý	bujar-ejš-í	‘wild’
benign-í	benign-ějš-í	‘benign’

The suffix *-ějš* is the only productive comparative marker and newly coined gradable adjectives follow this pattern (see the last row of (5) for an example). However, *-ějš* is not the only marker used to form comparatives

in Czech. As the traditional descriptions recognise (Dokulil et al. 1986; Karlík et al. 1995; Osolsobě 2016), there are two more ways of forming comparatives. The first of these is to attach only *š*, as in the forms below:<sup>2</sup>

(6)	POS	CMPR	
	star-ý	star-š-í	‘old’
	tvrd-ý	tvrd-š-í	‘hard’
	tich-ý	tiš-š-í	‘silent’
	drah-ý	draž-š-í	‘expensive’
	bohat-ý	bohat-š-í	‘rich’

A purely phonological account of the variation seems unlikely. For example, the adjectival root *star-* ‘old’ ends in the same segments as *bujar-* ‘wild’, and yet they differ in allomorph selection. Similarly, *kulat-* ‘round’ is similar to *bohat-* ‘rich’, but they pattern differently. For this reason, we will treat *-š* here as a morphologically conditioned allomorph of *-ějš*.

The third (and final) allomorph recognised in the traditional descriptions is a zero marker. Some examples are given in (7).

(7)	POS	CMPR	
	lehk-ý	lehč-(í)	‘light/easy’
	hezk-ý	hezč-(í)	‘pretty’
	měkk-ý	měkč-(í)	‘soft’
	tenk-ý	tenč-(í)	‘thin’
	vlhk-ý	vlhč-(í)	‘wet’

What one sees is that the final *-k* that is found in the positive degree of the adjectives in this class alternates with *-č* in the comparative.<sup>3</sup> As with the other cases discussed above, the positive and the comparative differ in the type of concord marker: the positive degree has ‘hard’ non-palatalising *ý* whereas the comparative has ‘soft’ palatalising *í*. Since the soft adjectival inflection is independently known to palatalise *k* to *č*, most traditional accounts propose that the comparative forms have the same base as the positive forms, i.e., with no comparative marker, where the comparative interpretation is signalled only through the shift in inflection class and the concomitant palatalisation.

<sup>2</sup>Some of the forms in (6) show (regular) palatalisation of velars before *-š*.

<sup>3</sup>In Section 2.4, we will observe that the final *-k* is a separate morpheme that derives gradable adjectives from other word classes.

If this analysis is correct, then the cases in (7) represent an instance where the comparative form is identical to the positive form, though the morphosyntactic identity is undone by the fact that each of them belongs to a different adjectival declension.

Summing up the traditional descriptions, the two non-productive allomorphs of the most frequent comparative marker *-ějš-í* thus correspond to various degrees of its reduction, going from left to right, as (8) brings out:

- (8) a. *ějš-í*  
 b. *š-í*  
 c. *-í*

One of the main goals of this paper is to present a theory that explains how such a reduction works and that makes some non-trivial predictions about how this type of reduction interacts with root suppletion. Before we get there, we must remove a potential objection to the traditional analysis. Specifically, it is not absolutely clear that the pattern in (8c) needs to be recognised as an independent pattern. The important question is the following: is the comparative marker *-š* radically absent in (7), or is there simply a phonological coalescence of the suffix *-k* (palatalised to *-č*) and the following *-š*? If the latter was the case, we only need to recognise two allomorphs of the comparative (rather than three).

The answer to this issue is underdetermined by the data, because the facts are compatible with either analysis (see e.g. Scheer 2001:34, who remains agnostic about which option should be chosen). However, there is one additional fact that shows an independent need for the traditional three-allomorph theory, and it comes from the dialect of North-East Bohemia (Bachmannová 2007). In this dialect, one can find comparative forms with no overt morphology (other than the soft declension agreement marker *-í*), whose explanation via cluster simplification is much less likely. Two of these forms are shown below:

(9)		St. Czech	N-E. Bohemian		
	POS	CMPR	CMPR		
	<i>ostr-ý</i>	<i>ostř-ějš-í</i>	<i>ostř-</i>	<i>-í</i>	‘sharp’
	<i>mokr-ý</i>	<i>mokř-ějš-í</i>	<i>mokř-</i>	<i>-í</i>	‘wet’

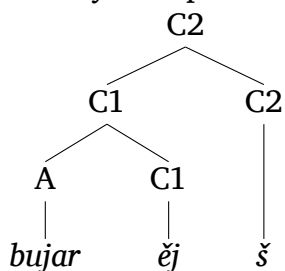
Given these findings, our goal here will be to provide an analytical space into which all the three ways of comparative marking could fit (i.e. *-ějš-í*,

-š-*í* and -*í*). If it turns out that there is need only for two of them, then the overall proposal will still (trivially) provide a way to deal with the facts, even if its full descriptive potential will not be empirically exhausted by the Czech data.

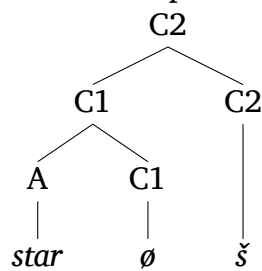
## 2.2 An account of the Czech facts

Moving now to the actual account, it is trivial to provide an analysis for the difference between the - $\emptyset$ -(*í*) class and the -š-(*í*) class. This difference is perfectly analogous to pairs such as *sheep—sheep- $\emptyset$*  vs. *heap—heap-s*: one (minor) class has a null marker where the other class has an overt marker. This simple logic can be extended to the difference between -š-*í* and -ějš-*í*, provided we assume two positions of exponence, i.e. if there are two comparative heads, C1 and C2, and if the suffix -ějš actually splits into -ěj and -š. In a regular comparative, which has both -ěj- and -š-, the -ěj- exponent spells out C1, and -š- spells out C2, in the manner indicated in (10). For comparatives which lack the -ěj- exponent, we assume, for now, that there is simply a zero allomorph of -ěj, as indicated in the tree in (11).<sup>4</sup>

(10) The -ějš-comparative



(11) The -š-comparative

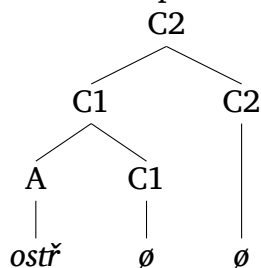


If only one position of exponence were assumed, we would need to store both -ějš- and -š- as separate allomorphs (in competition for a single position), and their partial identity would be purely accidental.

<sup>4</sup>As before, the structures are adjusted to fit the surface order of Czech, which is the mirror image ordering of the underlying functional sequence (see Cinque 2005). As in Cinque's work, we analyse mirror orders as arising through a series of standard movement operations, which affect phrasal nodes and move them either cyclically (i.e. spec-to-spec), or roll-up style. We highlight the mechanics of these movements in the next section.

The third class of comparatives can still be captured as a reduced version of (11), with both markers silent, as shown in (12).

(12) The  $\emptyset$ -comparative



Decomposing the comparative *-ějš* into two independent pieces *-ěj* and *-š* thus allows for a ‘principled’ approach to the gradual reduction of the full comparative marker, an account which cannot be stated without such a decomposition. By ‘principled approach’ we mean an approach where the similarity between *-ěj-š* and *-š* is not accidental: they share an identical morpheme.

Interestingly, it turns out that there is independent evidence that *-ějš* should be split into two parts indeed. The evidence comes from comparative adverbs, seen in the second column of (13). Here the *-š*-part of the comparative adjective is systematically missing. This holds both for the *-ějš*-class (first four rows) and the *-š*-class of comparatives (on the last row).

(13)	CMPR ADJ	CMPR ADV	
	rychl- <i>ej-š-í</i>	rychl- <i>ej-i</i>	‘faster’
	červen- <i>ěj-š-í</i>	červen- <i>ěj-i</i>	‘redder’
	hloup- <i>ěj-š-í</i>	hloup- <i>ěj-i</i>	‘sillier’
	bujař- <i>ej-š-í</i>	bujař- <i>ej-i</i>	‘merrier’
	draž- <i>š-í</i>	draž- <i>e</i>	‘more expensive’

The absence of *-š* is hard to attribute to phonology, because the adverbial marker *-i* has the same quality as the agreement marker *-í*, and the two differ only in length. If *-š* is not deleted due to a contact with the following *i*, it must correspond to a separate morpheme that is simply missing in all the adverbs, which independently supports the split analysis.

### 2.3 *The distribution of zeroes*

With the ‘split-CMPR’ proposal in place, we turn to an interesting asymmetry in the way zero morphology is distributed in Czech comparative adjectives. In particular, what we do find are cases where the zero marker is next to the root, and the outer marker is overt, as in (14a) (overt exponence is represented by  $\alpha$ ). What we do not find is a case where the inner marker is overt and the outer zero, as in (14b).<sup>5</sup>

- (14) a. ATTESTED:  $\sqrt{\quad}$   $-\emptyset$   $-\alpha$  (*star- $\emptyset$ -š- $\acute{i}$* )  
b. NOT ATTESTED:  $\sqrt{\quad}$   $-\alpha$   $-\emptyset$

This does not follow from anything yet, and it is unclear why such an asymmetry should arise, given the trees (10), (11), and (12). In particular, if the analysis in (12) is on the right track, the outer morpheme *can* in fact be silent, but only if the inner one is, so that zero morphology spreads from the root outwards:

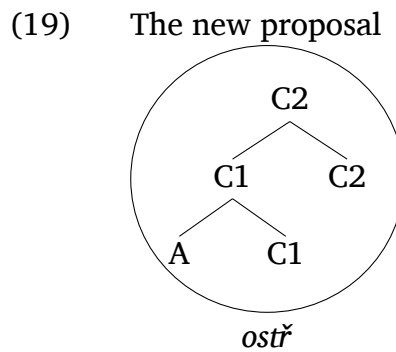
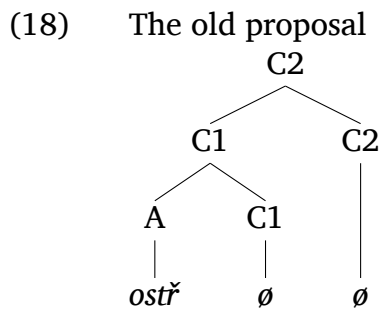
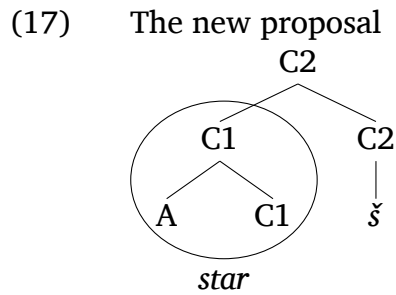
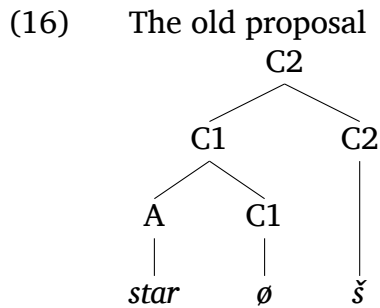
- (15) a. ATTESTED:  $\sqrt{\quad}$   $-\emptyset$   $-\alpha$  (*star- $\emptyset$ -š- $\acute{i}$* )  
b. ATTESTED:  $\sqrt{\quad}$   $-\emptyset$   $-\emptyset$  (*ostr $\acute{c}$ - $\emptyset$ - $\emptyset$ - $\acute{i}$* )  
c. NOT ATTESTED:  $\sqrt{\quad}$   $-\alpha$   $-\emptyset$

The explanation for this asymmetrical distribution of zeroes follows from a theory where such zero exponents arise as a consequence of non-terminal spell out, where a single lexical item may realise multiple positions in the syntactic/morphological structure (see e.g. Williams 2003, Siddiqi 2006, Starke 2009, Bobaljik 2012, Haugen & Siddiqi 2016). In such a theory, the root may spell out a unit that corresponds to multiple terminals, including one or more of the comparative heads. If such an approach is adopted, the original structures with zeroes (on the left) would be updated as depicted on the right.

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<sup>5</sup>The reasoning developed here is valid for any language that use different exponents for the expression of C1 and C2 (or any other heads following these). With respect to Czech comparative adverbs in (13), we propose that the Czech adverbializing morpheme spells out part of the comparative structure, i.e. C2, in addition to an adverbializing functional head. For this reason, the adverbial markers do not fall under the text generalisation.





It is clear from the diagrams that if zeroes are the product of non-terminal insertion, then they will make the two comparative markers disappear inside out, rather than in any other fashion.

To sum up, we are proposing an account of the allomorphic variation in terms of a bi-partite structure (which explains why one allomorph is a reduced version of the other) and non-terminal spell out, which explains why ‘zeroes’ first appear close to the root and expand outwards.

The correct pairing of the three comparative ‘allomorphs’ with individual roots is accounted for by proposing different lexical entries for different classes of adjectival roots. The first class is the regular one, which merely spells out A, as shown in (20a). Adjectives that take only -š in the comparative spell out a larger structure, consisting of A and C1, see (20b). Finally, adjectives that spell out the entire A + C1 + C2 show no CMPR marker, and their entry is as in (20c). This way we dispense with diacritics that pair the right allomorph with the right root. The correct comparative allomorph simply corresponds to a residue that is not spelled out by a given root.

- (20)
- a. Root that combines with  $\check{e}j\check{s}-(i)$   $\Leftrightarrow$  [ A ]
  - b. Root that combines with  $\check{s}-(i)$   $\Leftrightarrow$  [[ A ] C1 ]
  - c. Root that combines with  $-(i)$   $\Leftrightarrow$  [[[ A ] C1 ] C2 ]

The last ingredient we need to introduce in this section is the Superset Principle, as formulated in Starke (2009).

- (21) *The Superset Principle:*  
 A lexically stored tree can be inserted at a syntactic node iff the lexically stored tree contains the syntactic node.

The Superset Principle make sure that these entries can appear also in the positive degree. This is particularly relevant for entries of the type in (20b) and (20c), as these are larger than the syntactic structure of the positive degree, and still they can occur in the positive degree. The Superset Principle ensures this: in the syntax, the positive degree corresponds only to the feature [A], which is contained in all the lexical entries in (21), and so any of these entries can be inserted in the positive degree. The Superset Principle also accounts for the adjectives of the third category, which show a syncretism between the positive and the comparative degree.

## 2.4 *Splitting up A*

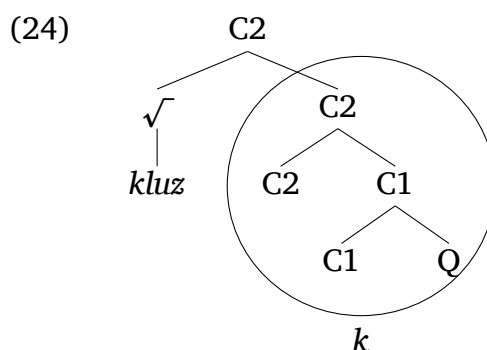
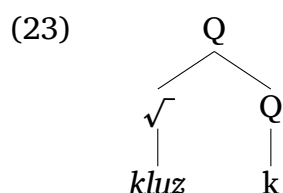
Recall from section 2.1 that there is a particular class of adjectives in Czech that seems to have a zero-marked comparative. In section 2.2, we provided a structure for the dialectal forms that correspond only to the root (see (19)). In this section, we turn to the standard-Czech forms listed in (22).

(22)	POS	CMPR	GLOSS OF A	BASE	GLOSS
	břit-k-ý	břit-č-í	‘sharp’	břit	‘edge’ (of a knife)
	hoř-k-ý	hoř-č-í	‘bitter’	hoř-e	‘sorrow’
	kluz-k-ý	kluz-č-í	‘slippery’	s-kluz	‘a slide’
	sliz-k-ý	sliz-č-í	‘slimy’	sliz	‘slime’
	vlh-k-ý	vlh-č-í	‘wet’	vláh-a	‘dew’
	ten-k-ý	ten-č-(í)	‘thin’	*ten	—

In the table, we suggest that the stem final *k* is a suffix and more in particular a derivational suffix, yielding the positive degree. We motivate this by showing in the table the roots which serve as the base to which the adjectiviser *-k* attaches. Note that in some cases (see ‘thin’), the root is just a cranberry morpheme and does not exist independently of the adjectival context.

Such morphologically complex bases require that we split up A into a

root feature and a functional head Q, which we take to be a head that contributes gradability (Bresnan 1973, Corver 1997, De Clercq 2017, De Clercq & Vanden Wyngaerd 2017a). This makes enough space in the positive degree (corresponding now to a constituent dominated by Q) for both the root and the *-k*, as shown in (23). Here we assume that the (verbal) root *kluz* ‘to slide’ spells out  $\sqrt{\quad}$ , the *-k*- suffix spelling out Q (in the positive degree, as in (23)), or the complex consisting of Q + C1 + C2 (in the comparative, as in (24)).<sup>6</sup>



The mechanism by which *-k* can spell out both Q (as in (23)) and the larger structure dominated by C2 (as in (24)) is again the Superset Principle: taking the lexical entry of *-k* to be the larger structure, as shown in (25), it can ‘shrink’ to spell out any node that it contains as a constituent.

(25) [ C2 [ C1 [ Q ] ] ]  $\Leftrightarrow$  /k/

A question that arises at this point is how these structures are created. In particular, looking at the structure in (25) and comparing it to earlier structure as in (19), we see that they contain quite different constituents: (25) has a constituent consisting of Q + C1 + C2 to the exclusion of  $\sqrt{\quad}$ , which precedes the rest of the terminals, whereas (19) has the adjectival root at the bottom of the hierarchy, and there is no constituent Q + C1 + C2 to the exclusion of the adjectival root. In the following section we turn to

<sup>6</sup>We leave it as an open question whether the root feature (represented as  $\sqrt{\quad}$ ) is at the bottom of the hierarchy, or needs to be further decomposed into functional heads all the way down (comparable to the way V is decomposed into a series of functional heads in Ramchand 2008). If the latter perspective is adopted,  $\sqrt{\quad}$  should be read as a mere shorthand for a series of functional heads.

the details of how these structures are derived from a common underlying functional sequence.

### 3 Getting technical: the spellout algorithm

In this section, we make explicit our assumptions concerning the details of how lexical insertion works. While our proposal for splitting the comparative into two heads is to a large extent independent of these assumptions, they will be crucial as the discussion gets more involved. They are also useful for readers to fully understand how in our approach the universal hierarchy of heads is transformed into a language-specific structure with a particular order of the elements. We adopt here the general Nanosyntax approach as developed in recent years by Michal Starke (Starke 2009 et seq.), and specifically we will draw upon the latest additions to the framework as described in Starke (to appear). At the same time, we shall also propose some nontrivial modifications to the framework, the most important one of which is the elimination of the Elsewhere Principle.

#### 3.1 *Merge F, Move complement of F*

The first assumption is that structures are built by merging one feature at a time. Every time a new constituent is created by merging a feature, the structure must be lexicalised. A ‘lexicalised’ structure is one where all its meaningful elements are realised (cf. Fábregas 2007). Still following Starke’s work, we adopt here the proposal that only non-terminal nodes can be spelled out (i.e. there is no insertion at a terminal).

Suppose, for instance, that syntax has produced an XP and merged it with the feature F, as in (26a). The lexicon is then consulted, and if it contains a lexical entry which contains the newly formed FP, then the structure is successfully lexicalised. (26b) is an example of such an entry.

- (26) a.  $[_{FP} F [ XP ]]$   
b.  $[_{FP} F [ XP ]] \Leftrightarrow / \alpha /$

The spell out at FP ‘overrides’ the spell out of XP; in other words, whatever lexical item was selected for insertion after syntax had constructed XP is no longer considered. This is called ‘Cyclic Override’ in the Nanosyntactic

literature.<sup>7</sup>

Suppose now that the lexicon does not contain (26b), but instead two separate entries, one for XP, and another one for F and its projection:

- (27) a. XP  $\Leftrightarrow$  / $\beta$ /  
b. [<sub>FP</sub> F ]  $\Leftrightarrow$  / $\gamma$ /

When the lexicon is accessed to see how (26a) can be spelled out, there is no way to spell out FP, since neither (27a) nor (27b) contain the whole FP (including the XP that FP contains), which is required by the Superset Principle. However, since every feature must be lexicalised at every cycle, a repair mechanism is set in motion. Repair mechanisms correspond to various types of movement operations which alter the structure, hoping that lexicalisation will succeed. We will now introduce the various types of movement one by one, and then explain the logic behind their choice.

The first possibility is to move the complement of F out of FP, as shown in (28). This movement option is called rollup or snowball movement, since it takes along anything that is contained in XP.

- (28) [<sub>FP</sub> XP [<sub>FP</sub> F t ]]

In this new ‘repaired’ configuration, all the features may be spelled out. XP is realised by (27a), and the lower FP can be lexicalised using (27b) (we assume that traces do not count).<sup>8</sup>

These two abstract scenarios (direct lexicalisation in (26) and complement movement in (28)) correspond precisely to the two derivational options that we need for Czech comparatives. Direct lexicalisation takes place when we merge C1 with the positive adjective (QP), as in (29a), and we lexicalise them at once, using an adjective of the size C1P, see (29b).

- (29) a. [<sub>C1P</sub> C1 [<sub>QP</sub> Q [ <sub>$\sqrt{P}$</sub>   $\sqrt{\quad}$  ]]  
b. [<sub>C1P</sub> C1 [<sub>QP</sub> Q [ <sub>$\sqrt{P}$</sub>   $\sqrt{\quad}$  ]]  $\Leftrightarrow$  /star/

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<sup>7</sup>A way to think about this is that Cyclic Override exists because there is a difference between ‘accessing the lexicon’ (looking into it and seeing which entries may apply at a given stage of the derivation), and actual insertion (which sends the relevant phonological information at PF). With that distinction in mind, what happens at each cycle is ‘lexical access’, but the actual insertion only happens when the derivation is finished.

<sup>8</sup>Various proposals have been made in the literature as to the precise mechanism from which this follows. The by far simplest assumption is that the movement in (28) does not leave a trace. For concreteness, we keep the trace in the representation for now.

However, suppose that we only have a QP-size root; then we cannot lexicalise (29a) directly. We must move QP across C1, as in (30):

$$(30) \quad [_{C1P} \text{QP} [_{C1P} \text{C1 } t \text{ }]]$$

In the configuration (30), all features can be lexicalised. QP is spelled out by the root (with the entry in (31a)), while the lower C1P is spelled out by *-ěj* (its entry is in (31b)). Note as well that the movement of QP across C1 also derives the correct suffixal order of exponents, which is the mirror image of the underlying functional hierarchy.

$$(31) \quad \begin{array}{ll} \text{a. } [_{QP} \text{Q} [_{\sqrt{P}} \sqrt{\quad} \text{ }]] & \Leftrightarrow \text{/bujar/} \\ \text{b. } [_{C1P} \text{C1} \text{ } ] & \Leftrightarrow \text{/ěj/} \end{array}$$

Suppose now that we add C2 on top of C1. Once again, two derivational options arise. Direct lexicalisation (by a root that can spell out C2P) derives zero comparatives:

$$(32) \quad \begin{array}{ll} \text{a. } [_{C2P} \text{C2} [_{C1P} \text{C1} [_{QP} \text{Q} [_{\sqrt{P}} \sqrt{\quad} \text{ }]]] & \\ \text{b. } [_{C2P} \text{C2} [_{C1P} \text{C1} [_{QP} \text{Q} [_{\sqrt{P}} \sqrt{\quad} \text{ }]]] & \Leftrightarrow \text{/ostř/} \end{array}$$

If a root is not large enough, the snowball movement of C1P across C2 is triggered, and C2P is spelled out as *-š*:

$$(33) \quad \begin{array}{ll} \text{a. } [_{C2P} [_{C1P} \dots \text{ } ] [_{C2P} \text{C2 } t \text{ }]] & \\ \text{b. } [_{C2P} \text{C2} \text{ } ] & \Leftrightarrow \text{/š/} \end{array}$$

The spellout of C1P is marked by three dots in (33a), because it is variable (as has already been discussed). Specifically, C1P may either be lexicalised directly by a root like *star* ‘old,’ in which case we derive the *-š-(t)* comparative. Alternatively, there may be movement inside C1P (see (30)), in which case we derive the *-ěj-š-(t)* comparative.

Notice finally that if a given root has a lexical entry that allows it to spell out C1P directly, then it will always do so. This suggests a hierarchy of operations, where movement is a last resort: only if direct lexicalisation fails does movement apply. Without such a hierarchy, the system would be able to spell out C1P as *\*star-ěj* instead of *star* ‘old’, clearly an undesirable result. Therefore, the two derivational methods discussed so far must be ranked in a spellout algorithm as follows:

$$(34) \quad \text{Merge F and}$$

- a. Spell out FP
- b. If (a) fails, move the complement of F, and retry (a)

The spellout algorithm, combined with the lexical entries in (35), allows us to derive the three Czech allomorphy patterns observed, namely *bujar-ěj-š-* ‘merrier’ *star-š-* ‘older’, and *ostr-š-* ‘sharper’.

- (35)
- a.  $[_{QP} Q [_{\sqrt{P}} \sqrt{\quad} ]]$   $\Leftrightarrow$  /bujar/
  - b.  $[_{C1P} C1 [_{QP} Q [_{\sqrt{P}} \sqrt{\quad} ]]]$   $\Leftrightarrow$  /star/
  - c.  $[_{C2P} C2 [_{C1P} C1 [_{QP} Q [_{\sqrt{P}} \sqrt{\quad} ]]]]$   $\Leftrightarrow$  /ostrš/
  - d.  $[_{C1P} C1 ]$   $\Leftrightarrow$  /ěj/
  - e.  $[_{C2P} C2 ]$   $\Leftrightarrow$  /š/

### 3.2 Move spec-to-spec

However, to derive the full range of examples, we must introduce spec-to-spec movement. This yields the extended spellout algorithm in (36):

- (36) Merge F and
- a. Spell out FP
  - b. If (a) fails, attempt movement of
    - (i) [NEW!!] the spec of the complement of F, and retry (a)
    - (ii) the complement of F, and retry (a)

We will comment on the ordering of the operations shortly, but first we want to show how the new derivational option works on its own. Let us then go back to (28), which represents the stage of the derivation where XP extracts out of FP. Suppose we now continue the derivation by adding a new feature, F2 (for clarity, we rename F to F1):

- (37)  $[_{F2P} F2 [_{F1P} XP [_{F1P} F1 t ]]]$

Suppose now that we have a lexical entry like in (38), i.e. one that spells out both F1 and F2:

- (38)  $[_{F2P} F2 [_{F1P} F1 ]]$   $\Leftrightarrow$  /δ/

This lexical entry cannot spell out (37), since (38) does not contain (37). Hence, movement must take place. In this particular case, what is needed in (37) is to move the XP (i.e. the highest Spec of the complement of F2)

out of F2P, as shown in (39). Here the XP has been cyclically moved from the complement of F1 to its Spec, and then further on to Spec,F2P:

(39)  $[_{F2P} XP [_{F2P} F2 [_{F1P} t [_{F1P} F1 t ]]]]$

F2P can now be spelled out as /*δ*/ using (38), since the structure is identical to the lexical entry (ignoring traces).

A concrete example of this strategy is the derivation of *-k* adjectives. Recall that the lexical entry for *-k* is as follows:

(40)  $[_{C2P} C2 [_{C1P} C1 [_{QP} Q ]]] \Leftrightarrow /k/$

When deriving the QP (the positive degree of such adjectives), we combine the Q head with the  $\sqrt{P}$ , see (41a). For those roots that are not adjectival (do not spell out QP), we cannot spell out (41a) without movement. We thus move the  $\sqrt{P}$  across Q, as shown in (41b), and spell out QP by *-k*. The derivation now continues by merging C1, as in (40c). This structure cannot be spelled out without movement, and hence,  $\sqrt{P}$  moves on by spec-to-spec movement, yielding (40d).

(41) a.  $[_{QP} Q \sqrt{P} ]$   
 b.  $[_{QP} \sqrt{P} [_{QP} Q t ]]$   
 c.  $[_{C1P} C1 [_{QP} \sqrt{P} [_{QP} Q t ]]]$   
 d.  $[_{C1P} \sqrt{P} [_{C1P} C1 [_{QP} t [_{QP} Q t ]]]]$

Here the remnant C1P is spelled out by *-k*, which has thereby pronounced the projection of C1 that would, on its own, be pronounced as *-ěj*. This is the correct result, since the comparative of the *-k* derived adjectives definitely lack this marker, regardless of whether they do or do not have the comparative *-š*.

This derivation also gives us reasons to rank the spec-to-spec movement higher than the movement of the whole complement. Suppose that instead of moving spec-to-spec as shown in (41d), we first moved the complement of C1, producing (42) as the first attempt after failing to spell out (41c):

(42)  $[[[_{QP} \sqrt{P} [_{QP} Q t ]]] [_{C1P} C1 t ]]$

In this structure, C1P can be spelled out by *-ěj*, which would follow in the string after the root and the *-k* suffix. If this was the first attempt at a repair structure, this would block the correct output, and therefore, we have to



rank spec-to-spec movement above complement movement. This result provides an empirical support for the proposal in Starke (to appear), who considers spec-to-spec movement more economical on the grounds that it carries less material.<sup>9</sup>

### 3.3 *Merge (X,Y)*

One last derivational option remains. So far we have only seen how various movement options give rise to suffixal marking. But languages also have prefixes, and these correspond to the absolute last option in the derivation, which is tried when nothing else works. Prefixes correspond to complex feature structures that are constructed in a separate workspace (Starke to appear). Only after they are constructed are they attached to the main derivation line, in a way which is similar to specifiers. Because of the need to construct the prefix as a specifier in a separate derivational workspace, Starke proposes that prefixes only arise if all other options fail.

In introducing the technical implementation of this idea, let us start from the fact that all suffixes arise through a movement of their complement, and therefore their lowest projection always corresponds to an FP and its head F; the complement of F has moved to the left, indicated by the dots in (43), leaving just a single branch inside the phrase. Recall from footnote 8 that we assume that spellout driven movement leaves no traces. However, even in the absence of a trace, one can see that movement must have occurred in the structure in (43), since without movement, there would be no reason to have FP present (Chomsky 1995a).

(43)    [ ... [ <sub>FP</sub> F ] ]

In addition, a lexical entry can also correspond to a syntactic object created by the merger of two features, as in (44):

(44)    [ <sub>F2P</sub> F2 F1 ]

Such an entry could never be suffixal, since the syntactic derivation needed to create suffixal order will always be as in (43), and the lexical item (44) does not contain the structure in (43). The only way a syntactic structure as in (44) can be created is through First Merge, taking an item from the

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<sup>9</sup>We will later modify this for specifiers that are externally merged.

inventory of features and merging it with another item, which is selected on the basis of the functional sequence. First Merge can apply either at the bottom of the main tree, or when a new derivation is started in a separate workspace. The latter is what happens in the creation of what Starke calls PRE material. This includes prefixes, but also auxiliaries and complementisers that occur to the left of their complement. These involve the creation of a complex constituent in a separate workspace, which is subsequently merged in the main spine in the manner of a specifier.

In contrast to the specifiers that arise through movement, however, these specifiers project. That is, a specifier which is a raised complement (like the XP in (45a)) does not project, since it moves to enable spellout, not to supply a feature required by the functional sequence. In contrast, a specifier that is constructed to meet the needs of the functional sequence does project, as shown in (45b) (see Starke 2004 on projecting specifiers):

- (45) a.  $[_{FP} XP [_{FP} F ]]$   
 b.  $[_{FP} FP [_{YP} Y Z ]]$

A final comment about First Merge is in order, which has an effect on the minimal content of complex specifiers. Given the spellout algorithm as formulated in (36), a derivation will always start with an application of Merge, before spellout is attempted. We take Merge to be an operation that combines two syntactic objects  $\alpha$  and  $\beta$  into a new syntactic object  $\{\alpha, \beta\}$  (Chomsky 1995b:226). The net effect of this is that specifiers contain minimally two features, since the first attempt at spellout applies after the first application of Merge.<sup>10</sup>

Let us illustrate this with an example of a concrete prefix, namely the Czech prefixal marker of the superlative *nej-* (see (2) above). Suppose we have reached the stage of the derivation where the comparative *bujář-ej-š* has been spelled out in the manner outlined above. We now proceed to merge the next feature in the functional sequence, SPRL, as shown in (46a).

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<sup>10</sup>Adger (2013) argues that Self Merge exists, i.e. that an element  $\alpha$  can Merge with itself. Merge ( $\alpha, \alpha$ ) then yields the singleton set  $\{\alpha\}$ . He claims that this possibility follows from the formulation of the Merge operation, and that preventing it would need a stipulation to the effect that the two elements merged be distinct. However, we believe that this requirement follows from a different requirement, namely that Merge operations need to respect the order imposed by the functional sequence. That is, an operation that Merges F1 and F2 is subject to the requirement that F1 and F2 be successive elements of the functional sequence. This will plausibly rule out Self Merge.

The assumed lexical entry of the superlative marker is given in (46b).

- (46) a.  $[_{SPRLP} SPRL [_{C2P} [_{C1P} [_{QP} \textit{bujar} ] ] [_{C1P \Rightarrow \textit{ej}} C1 t ] ] [_{C2P \Rightarrow \textit{š}} C2 t ] ] ]$   
 b.  $[_{SPRLP} SPRL C2 ] \Leftrightarrow /nej/$

As it is, (46b) cannot spell out (46a), so movement must be attempted. Neither snowball nor spec-to-spec movement will lead to spellout, however, since neither will yield (46b) or a substructure of (46b). So a new derivation is spawned that will, minimally, provide *Spri* and the preceding feature in the functional sequence, *C2*. This will spell out as *nej*, as its structure is identical to that of (46b). Then, the complex specifier is merged with the *C2P* of (46a), providing the *SPRL* feature as well as its label to the whole structure:

- (47)  $[_{SPRLP} [_{SPRLP \Rightarrow nej} SPRL C2] [_{C2P} \textit{bujar-ej-š} = (46a) ] ]$

Note that we get a kind of a ‘feature doubling’: what we really want is to add *SPRL*, but we first have to merge it with *C2* in a way that the feature *C2* is present twice: both in the specifier, and also in the main spine.

One last thing relating to prefixes is that once a separate derivational space is activated, then this new workspace is used as long as this specifier can be spelled out directly; only after the addition of a particular feature fails to spell out, the *Spec* is merged in the main spine and the main-spine derivation is resumed.

In order to see how this works, consider the proposal (by De Clercq & Vanden Wyngaerd 2017a) that also *SPRL* splits into *S1* and *S2*, for reasons that are similar to those discussed here (i.e. there are languages where superlatives are bi-morphemic). If that is so, the prefix *nej* has to be specified as in (48a). In such case, what happens is that once the separate workspace is opened, features are being added to the *Spec* for as long as it spells out directly, and only after the separate derivational workspace is used up (*S2* is the highest feature in (48a)), the *spec* is merged back into the structure, as shown in (48b).

- (48) a.  $[_{S2P} S2 [_{S1P} S1 C2 ] ] \Leftrightarrow /nej-/$   
 b.  $[_{S2P} [_{S2P} \mathbf{S2} [_{S1P} \mathbf{S1 C2} ] ] [_{C2P} \dots ] ]$

All of this is incorporated into the spellout algorithm in (49). (49a) says that direct spellout is always preferred. (49b) is a condition that regulates what happens when direct spellout fails in a separate workspace: it leads

to the closing off of that workspace. (49c) describes the two types of evacuation movements that take place when direct spellout fails in the main workspace. (49d) is responsible for the creation of a new workspace when everything else fails.

- (49) Merge F and
- a. Spell out FP
  - b. If (a) fails in the second workspace, undo merge F, and close the workspace by merging it with the main derivation; retry Merge F.
  - c. If (a) fails in the main space, attempt movement of
    - (i) the spec of the complement of F, and retry (a)
    - (ii) the complement of F, and retry (a)
  - d. If (c) fails, spawn a new derivation by merging F with the last successfully spelled out feature, i.e.  $F^{-1}$ , and retry (a).

This spellout algorithm applies recursively, i.e. after each successful spell-out, the entire procedure in (49) is repeated. The procedure as given in (49) is essentially a recapitulation of Starke (to appear).<sup>11</sup> With the technology in place, we turn to some new data.

## 4 English comparatives

In this section, we show that the approach developed for Czech allomorphy can be extended to English with interesting consequences for suppletion (to be explored in the next section). English has a morphological comparative (with the suffix *-er*), and a syntactic one (with *more*). Following Corver (1997), Bobaljik (2012), we will analyze *more* as a complex marker, since it is the comparative form of *much*. From this perspective, the contrast between *-er* and *more* pertains not only to their affixal vs free status, but encompasses also the complexity of the marker. Building on this observation, we can establish the following (tentative) Czech-English correspondence table, where we draw a parallel between the Czech complex marker *-ěj-š* and the English *more*, as well as a parallel between the

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<sup>11</sup>We note already here that we will be forced to update the formulation in (49) by introducing a distinction between projecting and non-projecting Specs.

simplex comparatives:<sup>12</sup>

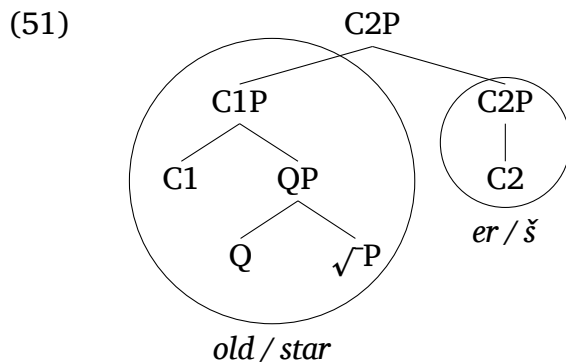
(50)

$\sqrt{\quad}$	Q	C1	C2
rychl		ěj	š
star			š
intelligent	mo		re
smart			er

In the table, we have literally decomposed *more* into two pieces (because it is a comparative of *much*), but it may also be considered an opaque piece of morphology realising both C1 and C2. The proposal we are about to develop is independent of the surface decomposability of *more*, and we will in fact adopt the proposal that *more* is a portmanteau for C1 and C2.

The crucial thing about the table is that it entails that in English as well, there is a distinction between two types of roots: those that spell out QP and those that spell out C1P, with the remainder of the comparative heads spelled out by the comparative morphology.

Below, we depict this parallel between Czech and English in the form of tree representations. What we are proposing here is that English comparatives also involve two comparative heads. In comparatives expressed by *-er*, the suffix spells out a single feature (C2), and the whole class is thus analogous to *š-í* comparatives in Czech. In order to bring out the parallel, we have simply placed the Czech lexical items for the comparative ‘old-er’ alongside the English lexical items.



<sup>12</sup>Beyond their bi-componential nature, the Czech *-ěj-š* comparative and the English *more* comparative obviously differ in position (POST vs PRE), and their status (affix vs separate word). Naturally, we will also want to capture the differences (not only the similarity).

We are again assuming that the trees are derived via spellout driven movements. First, we add features all the way up to C1P and spell out at every step by the root, without the need to move anything. This is because a root like *old* will be specified for the whole C1P, exactly as in the case of the Czech *star* ‘old’ discussed above:

$$(52) \quad [_{C1P} C1 [_{QP} Q [_{\sqrt{P}} \sqrt{\quad} ] ] ] \Leftrightarrow /old/$$

C2P is, however, not contained in the lexical entry of such roots, hence repair strategies are triggered after the merger of C2. Ultimately, snowball movement moves C1P across C2, and lexicalisation of C2P by the suffix *-er* is successful. The entry for *-er* is given in (53), which reflects the analysis presented in (51).

$$(53) \quad [_{C2P} C2 ] \Leftrightarrow /-er/$$

Due to the Superset Principle (21), the lexical entry in (52) can also spell out the positive degree, i.e. a syntactic structure which only corresponds to QP, and lacks C1.

For the English syntactic comparatives, a slightly different structure is needed. The starting point of our analysis is the proposal that roots which combine with the comparative marker *more* are simple gradable adjectives, i.e. they spell out QP:

$$(54) \quad [_{QP} Q [ \sqrt{P} ] ] \Leftrightarrow /intelligent/$$

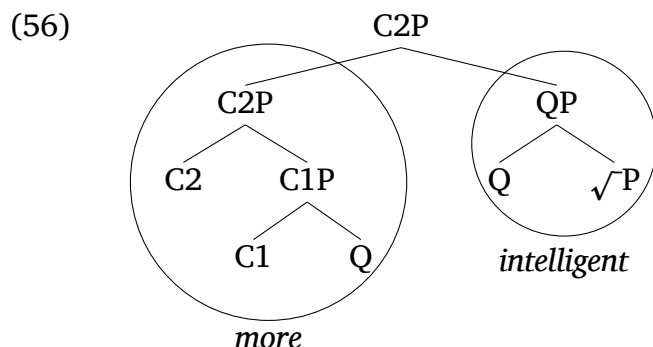
The entries in (53) and (54) correctly encode the fact that the root *intelligent* cannot combine with *-er* to form a comparative, since neither the root nor the suffix spell out C1. In the analysis we propose, the C1 feature is present in the lexical entry for *more*. What does this entry look like beyond having C1?

Recall that in the theory of spellout driven movement that we have highlighted above, PRE-markers have to have a specific shape of their lexical entry, which at its bottom contains both the feature to be spelled out (i.e. C1), but also an overlapping feature to which C1 is added in order to form a left-branch Spec. This has to be the Q feature, which is the top-most feature of an adjective like *intelligent*. In addition, *more* also spells out C2, and its lexical entry must then be as follows:

$$(55) \quad [_{C2P} C2 [_{C1P} C1 Q ] ] \Leftrightarrow /more/$$

Including the Q in the lexical entry is not only theoretically required, but it is also necessary in order to express the suppletion relation between *more* and *much*, where *much* is a Q marker (rather than a C1 marker), as argued in De Clercq & Vanden Wyngaerd (2017a) and Caha (2017a). We will say more about suppletion in the next section.

With the lexical entries in place, let us turn to how the derivation proceeds. Suppose we construct QP and spell it out by *intelligent*. We then go on to merge C1. However, *intelligent* cannot spell out C1, since its lexical entry does not contain it. Therefore, rescue operations are triggered. These fail to deliver the right configuration for *more* (or any other item) to apply, and so the derivation ultimately has to continue by creating a complex Spec in a separate workspace, merging C1 with Q. Since the Spec spells out directly, the feature C2 is merged with the specifier in the separate workspace. Once the Spec is integrated with the main projection line, the final product looks as follows:



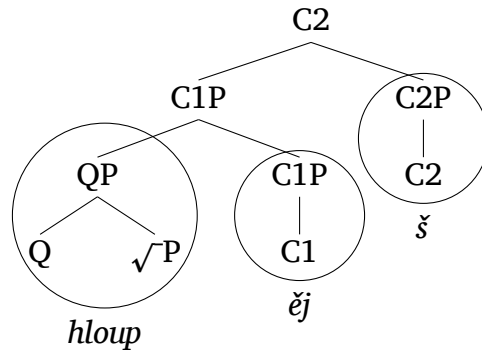
This is (obviously) a different derivation compared to what happens to Czech gradable adjectives specified as QP. In Czech, when C1 is added, the derivation is steered in a different direction since the lexicon contains the suffixal C1 marker *-ěj*, whose entry looks as in (57a).

- (57)
- a.  $[_{C1P} C1 ] \Leftrightarrow /ěj/$
  - b.  $[_{C2P} C2 ] \Leftrightarrow /š/$

Due to the existence of such a marker, a snowball movement of the QP succeeds in producing a remnant C1P that can be lexicalised by (57a) (see the C1P in (58)). This feeds into the next cycle where C2 is added, first as a feature to the left of the structure spelled out as *root + ěj*. But then again, due to the fact that there is a suffixal lexical entry for *-š* (shown in

(57b)), a second snowball movement produces a configuration that can be lexicalised. The result of the derivation is shown in (58):

(58) The *-ějš-*comparative



Ultimately, the relevant difference between the different kinds of structures is triggered by the fact that roots and affixes vary in their size and shape. Roots can be either small (just the root, as with the *-k* derived adjectives), medium (QP), large (C1P) or extra large (C2P). Because of the way spellout proceeds, the roots always spell out as much structure as possible, and the rest is left for post-markers (suffixes) or pre-markers (*more*). In effect, we observe a tradeoff between the root and the affixes with respect to the amount of the functional sequence they spell out: as the root becomes larger, the affixes get to spell out less, and conversely. This approach does away with the zero morphemes, and does not need any *ad hoc* diacritics to express how a root selects the right allomorph. The correct structures simply arise as the result of an interaction between the spellout algorithm with the size and shape of the lexical items.<sup>13</sup>

<sup>13</sup>A lexical approach to the distinction between morphological and periphrastic comparatives in English is also taken by Bobaljik (2012), Gouskova & Ahn (2016), among others. This is not to deny that there might be certain phonological regularities governing the choice for either option. There is in fact an extensive literature on this issue, which has identified a rangel of factors relevant to the choice, such as the frequency of the adjective, as well as a variety of phonological factors (see e.g. Jespersen 1954, Aronoff 1976, Quirk et al. 1985, Culpeper & Leech 1997, Graziano-King 1999, Mondorf 2003, Graziano-King & Smith Cairns 2005, LaFave 2005, Hilpert 2008, Mondorf 2009, Bobaljik 2012, Matushansky 2013, Enzinna 2017).



## 5 Suppletion

### 5.1 Portmanteau suppletion and contextual suppletion

The approach to allomorphy of the comparative in Czech and English provides us with the possibility to explore a new—more restrictive—approach to suppletion in comparative formation than standardly assumed. In order to show that, we first consider the Distributed Morphology (DM) approach to this phenomenon, in particular the one developed by Bobaljik (2012).

In this approach, there are two different kinds of suppletion, portmanteau suppletion and (what we will call) contextual suppletion. The first kind is instantiated by such pairs as *bad-worse*. Bobaljik proposes that the suppletive form is a portmanteau for a complex node containing the A node and the CMPR feature.<sup>14</sup> The Vocabulary Items for this case are shown in (59). They are an intuitive way of encoding that *worse* conveys the meaning of both the root meaning BAD and the meaning of CMPR.

- (59) a.  $\sqrt{\text{BAD} \oplus \text{CMPR}} \Leftrightarrow \textit{worse}$   
b.  $\sqrt{\text{BAD}} \Leftrightarrow \textit{bad}$

However, for pairs such as *good-better*, Bobaljik proposes that *-er* spells out the (non-split) CMPR node, which only leaves the A node for spellout by the root. Hence, there must be a second road to suppletion, which is that of contextual allomorphy, as given by the set of rules in (60).

- (60) a.  $\sqrt{\text{GOOD}} \Leftrightarrow \textit{be(tt)-} / \text{ \_\_\_\_\_\_ ] CMPR ]}$   
b.  $\sqrt{\text{GOOD}} \Leftrightarrow \textit{good}$

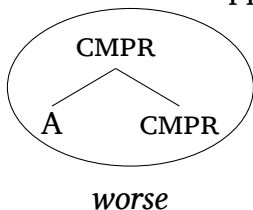
- (61)  $\text{CMPR} \Leftrightarrow \textit{-er}$

These rules say that the form of the root GOOD is *bett* in the context of CMPR, and *good* elsewhere. These Vocabulary Items correspond with structures such as (62) and (63), where the circle in (62) indicates that *worse* is the spellout of two features or heads, and the arrow in (63) indicates that insertion under A is sensitive to the presence of CMPR.

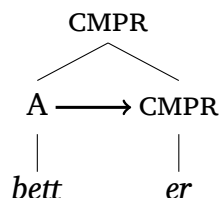
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<sup>14</sup>Bobaljik is noncommittal about the question how this complex node arises, either through fusion of two heads under a new (complex) terminal, or through spellout of a nonterminal node that dominates both heads.

(62) Portmanteau suppletion



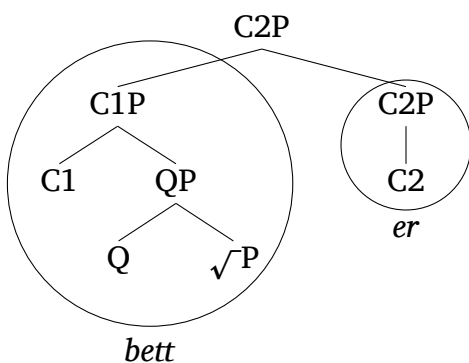
(63) Contextual suppletion



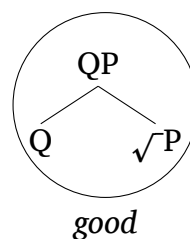
### 5.2 Contextual suppletion as portmanteau suppletion

The strongest argument for maintaining a dual system (where some suppletion is due to portmanteau and some to context sensitivity) is that sometimes, suppletion apparently co-occurs with overt marking. For instance, Embick (2016:275) criticizes phrasal-spellout theories precisely for the empirical inadequacy of their prediction that ‘[s]pecial stem allomorphs of a Root triggered by a feature [X] should not co-occur with an independent realization of [X].’ The comparative *bett-er* can be considered as a case in point, since suppletion co-occurs with an overt comparative marker. However, once CMPR is decomposed into C1 and C2, the portmanteau analysis captures the facts straightforwardly. Specifically, we can say that *bett* spells out only the root plus C1, and that *-er* spells out C2. This is shown in (64), where the circles indicate how the syntactic constituents map onto spellouts. For clarity, we also show the tree for *good*.

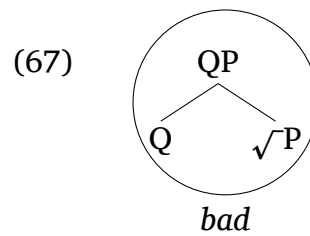
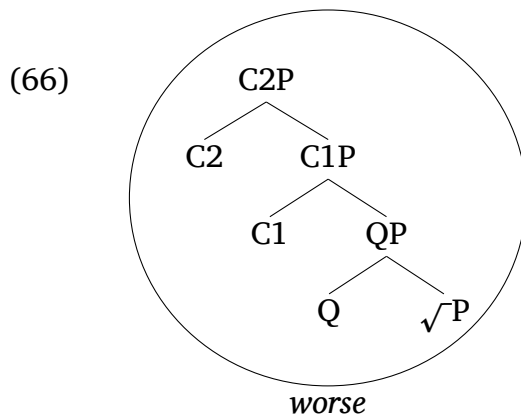
(64)



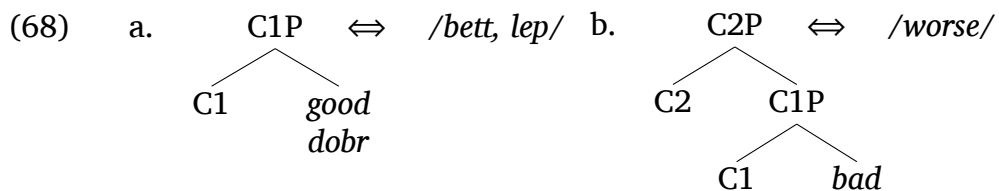
(65)



This approach also allows us to capture cases like *bad—worse*, where there is no apparent double marking, see (66) and (67).



In our theory, suppletive roots like *bett-* (or the Czech equivalent *lep-*) are rather similar to roots like *old* (which also spell out C1P, recall (51)). Roots like *worse* are in turn similar to roots like *ostr-*, recall (19). However, they differ in that they entertain a lexical relation with another lexical item. We may represent the lexical relatedness of the *good-bett* pair by assuming that the lexical item *bett-* contains a reference (a pointer) to an existing lexical item, *good*, as in (68a). Similarly, *worse* contains a pointer to *bad*. Non-suppletive items do not contain such pointers.



Items with pointers like *bett-* are read as follows: C1P can be spelled out as *bett-* only if in the previous cycle, QP has been spelled out as *good*. This means that if the syntax builds QP, only *good* is a candidate for insertion. *Bett-* only becomes a candidate after C1 is merged with *good*. The insertion of *bett-* at C1P will prevent the pronunciation of *good* in the comparative because of the principle of Cyclic Override: a successful spellout of C1P will override any earlier spellout of material contained inside C1P.

Nonsuppletive roots with a morphological comparative (like *old*) spell out C1P exactly like *bett-* in (64), but lack a lexically related counterpart which they point to; as a result, they will be inserted both in the positive degree (as QPs) and the comparative degree (as C1Ps).

At this point, we have rephrased Bobaljik's contextual allomorphy rule in terms of portmanteau suppletion, while at the same time we avoided the problem of apparent double marking. Such a reduction of two mechanisms for suppletion in favour of a single mechanism is theoretically attractive. In addition, it makes our theory also more empirically predictive, as we argue below.

### 5.3 *The Comparative Suppletion Generalization*

In order to see the prediction which arises when contextual suppletion is abandoned, consider the following reasoning. We start from the fact that under the portmanteau-based approach to suppletion, we get a suppletive root pair only when we have two entries for a root. The positive degree entry spells out a QP, and the suppletive comparative entry adds either C1 (*bett-*) or C1 and C2 (*worse*). From this setup, it follows that suppletive roots cannot leave both comparative heads C1 and C2 available for insertion. This predicts that a bi-partite comparative marker (which necessarily spells out both C1 and C2) is incompatible with suppletion (which spells out minimally QP + C1). We state the prediction below.

(69) *The Comparative Suppletion Generalisation (CSG)*

When the comparative is expressed by two overt markers in addition to the root (or when the comparative marker is a portmanteau that expresses the content of these two markers), there is no suppletion.

The CSG, when applied to English, predicts that syntactic comparatives with *more* never trigger suppletion: since *more* spells out both C1 and C2, it is predicted to be incompatible with suppletive roots. This prediction is borne out, and has been observed independently in Bobaljik's study. However, he proposes to subsume it under a different generalisation, namely the *Root Suppletion Generalisation* (RSG) (Bobaljik 2012:3):

(70) *Root Suppletion Generalisation*

Root suppletion is limited to synthetic (i.e. morphological) comparatives.

Bobaljik proposes to derive the RSG as a consequence of a locality restriction, which prevents contextual suppletion between items separated by a

word boundary (or, more specifically, by a phrasal projection of the head). What we have seen, however, is that the facts which the RSG derives for English can also be derived by the CSG. In order to see where the predictions of RSG and CSG differ, we would like to turn back to the Czech data, which provide an interesting test case for the two approaches.

#### 5.4 *Suppletion in Czech*

Recall that in Czech, there is a productive bi-morphemic comparative marker *-ěj-š-(í)*, and two reduced comparative markers (*-š-(í)* and the zero marker). In section 2, we have provided an account of these facts by proposing a split comparative structure, where the roots spell out different sizes of structure, leading to differences in the number of features to be spelled out by comparative morphology. The important difference with English is that *-ěj-š-* is a word-internal comparative marker, and so the approach based on Bobaljik’s RSG and contextual suppletion makes no predictions about this case. In particular, there is no reason to expect that *-ěj-š-* comparatives should be incompatible with suppletion. However, if we restrict suppletion to portmanteau suppletion, we predict that there should be no suppletion in *-ěj-š-* comparatives, because these spell out two different heads, and should therefore block suppletion by the CSG (69). This section explores this prediction and argues that it is in fact borne out.

Czech descriptive grammars vary as to how many forms are considered suppletive, since the phenomenon is known to be gradual and there is a fuzzy boundary between ‘pure’ suppletion, irregularity (e.g., irregular lengthening or reduction of the root) and full concatenativity. With this in mind, let us turn to the actual descriptions. Dokulil et al. (1986:379) and Ziková (2016) list five suppletive adjectives which are considered ‘fully irregular’; these are given in (71). Osolsobě (2016) considers the first four suppletive, while the last one of them is ‘irregular, but not suppletive’.<sup>15</sup>

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<sup>15</sup>We consider both of these cases suppletive, as we endorse a theory without morphologically triggered readjustment rules.

(71)	ADJECTIVE		ADVERB		
	POS	CMPR	POS	CMPR	
a.	dobr-ý	lep-š-í	dobř-e	lép-e	‘good’
	špatn-ý	hor-š-í	špatn-ě	hůř-e	‘bad’
	mal-ý	men-š-í	mál-o	mén-ě	‘small’
	velk-ý	vět-š-í	hodn-ě	víc-e	‘big’
b.	dlouh-ý	del-š-í	dlouz-e	dél-e	‘long’

For completeness, (71) also lists the forms of the corresponding adverbs, in the final two columns. These show the same suppletive root as the adjective (though subject to palatalisation and vowel lengthening), but crucially lack the *-ěj* just like their adjectival counterparts. Non-suppletive forms mostly have *-ěj* both in adjectives and adverbs, as in (72).

(72)	ADJECTIVE		ADVERB		
	POS	CMPR	POS	CMPR	
	rychl-ý	rychl- <b>ej</b> -š-í	rychl-e	rychl- <b>ej</b> -i	‘fast’
	červen-ý	červen- <b>ěj</b> -š-í	červen-ě	červen- <b>ěj</b> -i	‘red’
	hloup-ý	hloup- <b>ěj</b> -š-í	hloup-ě	hloup- <b>ěj</b> -i	‘silly’
	bujar-ý	bujar- <b>ej</b> -š-í	bujar-e	bujar- <b>ej</b> -i	‘merry’

The implication, however, goes only one way: it is possible for a root to spell out C1P (and hence lack *-ěj*) without being suppletive, i.e. without having a lexically related competitor for the spellout of the positive degree (QP). Therefore, the theory predicts that some non-suppletive roots may also lack *-ěj*. One case confirming it is given in (73).

(73)	ADJECTIVE		ADVERB		
	POS	CMPR	POS	CMPR	
	drah-ý	draž-š-í	dráz-e	dráž-e	‘expensive’

All facts considered, we conclude that all the suppletive adjectives listed in Dokulil et al. (1986:379) and Ziková (2016) belong in the class that lacks the C1 marker *-ěj*. This fact can be seen as nothing but an instance of the CSG, repeated below for convenience:

- (69) *The Comparative Suppletion Generalisation (CSG)*  
 When the comparative is expressed by two overt markers in addition to the root (or when the comparative marker is a portman-

teau that expresses the content of these two markers), there is no suppletion.

### 5.5 Some potential counterexamples

In this section we take a closer look at some potential counterexamples to the CSG as formulated in (69) above. The most serious challenge to the CSG is posed by the adjective *brz-k-ý* ‘early’, which has the suppletive comparative *dřív-ěj-š-í* ‘former/earlier’, with the two comparative suffixes, in apparent contradiction of the CSG. The pair is treated as suppletive in Křivan (2012:26).

However, the overview article Osolobě (2016) designates the suppletive relation as ‘controversial’. The reason for this is that there is a plausible alternative analysis of the comparative *dřív-ěj-š-í*, namely as an adjective derived from the comparative adverb *dřív-e* ‘earlier’. This analysis is adopted also in Dokulil et al. (1986:382).

The basic idea of these approaches is that the meaning ‘early’ is encoded in the Czech grammar primarily through temporal adverbials. This holds both for the positive, where the adverb *brz-o* ‘early’ seems to be the basic form, and the adjective *brz-k-ý* is derived from this adverb by the adjectival *k*, which we have already discussed above (section 2.4). This is similar to English, where the adjective *early* also (at least historically) contains an adverb, specifically the adverbial suffix *-ly* attached on top of a cranberry type of root *ere-*.

The same derivational relationship carries over (for Czech) to the comparative. The idea is that the comparative adverb is again the base from which the adjective is derived; this is depicted below in (74). The arrows depict the proposed derivational relations between the adverbs and the adjectives, and also an assumed (suppletive) relation of gradation between the adverbs. No direct relation holds between the adjectives.

(74)

	POS		CMPR	‘early’
ADV	brz-o	↔	dřív-e	
	↓		↓	
ADJ	brz-k-ý		dřív-ěj-š-í	

Under this view, there is indeed a suppletive relation between the roots *brz-* and *dřív-*, but only in the adverbs. And crucially, here the CSG (69) is

obeyed: the form *dřív-e* indeed lacks the overt C1 marker *-ěj*, and behaves like all suppletive adverbs, recall (71).

The only suspicious part of the analysis (74) is the fact that the marker which derives the adjective *dřív-ějš-í* from the adverb is the same as the comparative marker. This gives the impression that the form is actually composed of a suppletive root and the regular bi-morphemic comparative marker on top. However, the *-ějš-(í)* suffix independently turns adverbs into adjectives, as in the following cases, treated as analogous to the problematic form *dřív-ějš-(í)* in Dokulil et al. (1986:382):

(75)	ADVERB	ADJECTIVE
	zítr-a ‘tomorrow’	zítr-ějš-(í) ‘tomorrow’s’
	včer-a ‘yesterday’	včer-ějš-(í) ‘yesterday’s’
	zd-e ‘here’	zd-ějš-(í) ‘local’
	vn-ě ‘outside’	vn-ějš-(í) ‘outside’
	vedl-e ‘beside’	vedl-ějš-(í) ‘neighbouring’
	tam ‘there’	tam-ějš-(í) ‘the N there’
	nyn-í ‘now’	nyn-ějš-(í) ‘present-day’

The table shows that there is indeed a suffix *ějš-(í)*, homophonous with the comparative marker, which derives adjectives from adverbs. The resulting forms are incompatible with any regular comparative modifier, like measure phrases, *than*-phrases, etc. All summed up, the adjective *dřív-ěj-š-í* ‘earlier’ has been (for reasons independent of CSG) analysed as an adjective derived from a suppletive adverb. Once this analysis is adopted, the form is fully consistent with CSG; in fact, the suppletive adverb *dřív-e* adds another piece of evidence in its favour.

The second problematic example is in (76) (Janda & Townsend 2000:25).

(76)	POS	CMPR	SPRL
	svat-ý	(??)svět-ější	nej-svět-ější ‘holy’

The first reason to be suspicious about this example is that according to native-speaker judgements, the comparative (given as such in Janda & Townsend 2000) is marginal at best, which we indicate by the question marks. The superlative is well-formed, but it only has an absolute or ‘relative’ meaning (‘holy to a very high degree’) and it lacks the relative meaning ‘holier than all others’. To express the relative meaning, the ‘regular’ series would have to be used:



(77)	POS	CMPR	SPRL	
	svat-ý	svat-ější	nej-svat-ější	‘holy’

Elative superlatives can be independently shown not to conform to the principles that govern the form of regular comparatives and superlatives. This has been argued by Bobaljik (2012), who shows that elatives display ABA patterns, as in Italian *buono-migliore-buonissimo* ‘good-better-excellent’. Therefore, we set this example aside.

The final potential counterexample is the adjective ‘white’ (Janda & Townsend 2000:25). The comparative is either completely regular, or shows a change of the root vowel. The latter pattern is problematic, since this irregular shape is accompanied by the *-ěj-š-(í)* marker.

(78)	POS	CMPR	SPRL	
	bíl-ý	bíl-ějš-í	nej-bíl-ějš-í	‘white’
	bíl-ý	běl-ějš-í	nej-běl-ějš-í	‘white’

The pattern could be captured in two ways. The first one would be to say that *bíl* is an elsewhere form, and that *běl-* is specifically comparative (which automatically leads to its emergence also in the superlative). However, there is a problem with this idea, namely that the variation between *bíl* and *běl* extends to property denoting nouns like *stupid-stupidity*. Such nouns are derived in Czech by the suffix *-ost* ‘-ness’, and with suppletive adjectives, we can see that this suffix attaches to the positive root:

(79)	ADJECTIVE		NOUN		
	POS	CMPR	POS-BASE	CMPR-BASE	
	špatn-ý	hor-š-í	špatn-ost	*hor-ost	‘bad(ness)’
	mal-ý	men-š-í	mal-ost	*men-ost	‘small(ness)’
	nízk-ý	niž-š-í	nízk-ost	*niž-ost	‘low(ness)’

With this in mind, it is surprising that the noun for ‘whiteness’ can be both *běl-ost* (the preferred choice) and (more marginally) *bíl-ost*. This makes the characterisation of *běl-* as a comparative form suspicious, because *-ost* otherwise never attaches to comparative stems. This leads us to suggest that there are actually two different roots, *běl* and *bíl*, each specified as a regular positive degree adjective, i.e. QP, and each with its own (almost) full paradigm. This idea, where each of the relevant forms is expected to have two shapes, is depicted below:

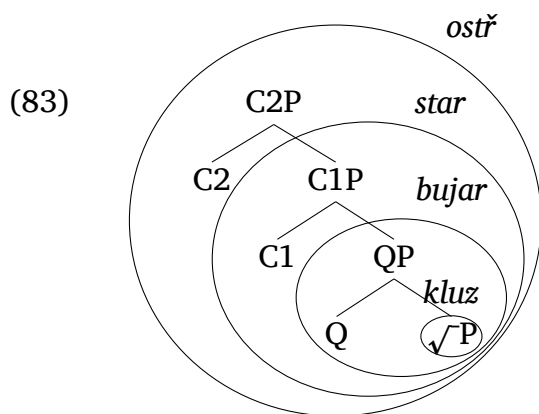
	ADJECTIVE		NOUN	
	POS	CMPR	POS-BASE	
ROOT 1	bílý	bílejší	bíl-ost	'white'
ROOT 2	*bělý	bělejší	běl-ost	'white'

The gap in the positive degree is still to be explained, but this cannot be done so by reference to degree, because of the appearance of *běl-* in the nominalisation. In sum, we conclude that there are good reasons to assume that the CSG holds without exception, and constitutes a strong generalisation that teaches us something about how suppletion works.

## 6 Faithfulness

At this point we need to address two different, but related, problems with our assumptions so far. Both of these problems will be solved by introducing a Faithfulness Restriction on the principle of Cyclic Override. To see them, recall that we have assumed the existence of adjectives of varying sizes, as in (81), which are represented arboreally in (83). The two comparative suffixes of Czech are repeated in (82):

- (81) a.  $[\sqrt{P} \sqrt{ } ] \Leftrightarrow /kluz/$   
 b.  $[_{QP} Q [_{\sqrt{P}} \sqrt{ } ] ] \Leftrightarrow /bujar/$   
 c.  $[_{C1P} C1 [_{QP} Q [_{\sqrt{P}} \sqrt{ } ] ] ] \Leftrightarrow /star/$   
 d.  $[_{C2P} C2 [_{C1P} C1 [_{QP} Q [_{\sqrt{P}} \sqrt{ } ] ] ] ] \Leftrightarrow /ostř/$
- (82) a.  $[_{C1P} C1 ] \Leftrightarrow /ěj/$   
 b.  $[_{C2P} C2 ] \Leftrightarrow /š/$



Now suppose that the syntax merges  $\sqrt{P}$  and consults the lexicon for spell-out, as per the spellout algorithm.<sup>16</sup> All the lexical items of (81) now qualify for insertion in virtue of the Superset Principle. Two problems arise at this point: the first is how to make a choice between those four candidates. Intuitively, what we want is for the choice to be free, depending on what one wants to express. But this intuition is incompatible with the Elsewhere Principle, which in the case of multiple candidates for spellout selects the one that is the closest match with the syntactic structure, and discards all others. This would in effect allow only the insertion of adjectives of the *kluz*-type at  $\sqrt{P}$ , i.e. the ones with the smallest lexical trees, and rule out insertion of all the other types of adjective. If we go on to merge Q creating QP, consulting the lexicon finds adjectives of that size and will insert one of them, to the exclusion of all adjectives of different sizes. As a result, a root like *star* ‘old’ (lexically specified as C1P) will not be allowed to surface in the positive degree, corresponding to a QP. We shall call this problem the problem of Free Choice: free lexical choice is severely restricted by the system set up so far, in a way that is undesirable.<sup>17</sup>

The second problem is even more serious, and is in a way the mirror image of the first. We shall call it the problem of Faithfulness. Suppose we found a way to spell out QP as *bujar* ‘merry’, and proceeded to merge C1. To derive the correct *bujar’ej*, spellout driven movement has to apply (as explained in section 3 above). But given (82), there is not just one but two different types of lexical items that could spell out C1P without movement, namely adjectives of size C1P, like *star* ‘old’, and adjectives of size C2P,

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<sup>16</sup>To be consistent with our earlier assumptions about First Merge, this would require that  $\sqrt{P}$  be binary, i.e. composed of at least two even smaller heads. Since the argument we develop is independent of this issue, we ignore this complication for now.

<sup>17</sup>The free choice problem was noted, in a different but related context, by Marantz (1995, 1996, 1997). Marantz observes that allowing competition at the level of root insertion will have the effect that a suppletive root will win the competition from all others (since it is more specific), preventing their insertion, and thus Free Choice. Marantz (1997) proposes to solve the problem by claiming that root suppletion does not exist (and that apparent counterexamples like *go-went*, *bad-worse* instantiate the functional vocabulary). Harley (2014) argues against Marantz’ position, claiming instead that roots are individuated in the syntax, i.e. prior to vocabulary insertion, by means of a numerical index (following Pfau 2000, 2009, Acquaviva 2009). Insertion rules then eliminate the competition between roots (except the suppletive ones, which have the same index) by making reference to these indices. The solution we shall present to the Free Choice problem is close in spirit to Harley’s, but without needing the assumption that the syntax works with individuated roots.

like *ostř* ‘sharp’. Given the fact that the spellout algorithm favours non-movement over movement derivations, and given the principle of Cyclic Override, at C1P the ‘unfaithful’ spellouts *star* ‘old’ and *ostř* ‘sharp’ could override the earlier spellout of *bujar* ‘merry’, and the form *bujar-ěj* would never be derivable. We call these spellouts unfaithful because they do not preserve the lexical choice made at the lowest level of insertion. This forced spellout of items which are unfaithful to the original lexical choice results from the following three factors: (i) the spellout algorithm (which favours spellout without movement), (ii) the principle of Cyclic Override (which allows unfaithful spellouts), and (iii) the way we have set up the structure of the lexical items.

The solution to both of our problems (i.e. the Free Choice and the faithfulness problem) lies, we believe, in restricting the applicability of the mechanism of Cyclic Override by imposing a Faithfulness Restriction. A first formulation of the restriction is given in (84) (which we shall have reason to modify below):

- (84) *Faithfulness Restriction (FR)* (to be modified)  
 A spellout  $/\alpha/$  may override an earlier spellout  $/\beta/$  iff  $/\alpha/ = / \beta/$

The FR entails that a lexical item may be overridden at a higher level only if the ‘overrider’ is the same lexical item. In the example we just discussed, *bujar* ‘merry’ could never get overridden by *star* ‘old’ or *ostř* ‘sharp’ at C1P, since they are not the same lexical items. In contrast, if  $\sqrt{P}$  were spelled out as *star*, this spellout can (and will) be overridden by *star* both at QP and C1P, since the overrider is the same lexical item.

As it stands, the FR is overly restrictive, however. If we think back of the way suppletion works, an adjective like *good* is of size QP and gets overridden by *bett* at C1P. This is a kind of an override that we want to allow. However, the FR as given in (84) blocks it, since *good* and *bett-* are not the same lexical item. But there is a sense in which this case is different from the ones where over-riding should be blocked. Specifically, there exists a suppletive relationship between *good* and *bett-*, which is expressed by the pointer to *good* in the lexical entry of *bett-*. Building on this, we can now bring in the suppletive cases by allowing override by lexical items which are either identical, or lexically related by means of a pointer:

- (85) *Faithfulness Restriction (FR)*  
 A spellout  $/\alpha/$  may override an earlier spellout  $/\beta/$  iff
- a.  $/\alpha/ = / \beta/$
  - b.  $/\alpha/$  contains a pointer to  $/\beta/$

In the case where  $/\alpha/ = \textit{bett}$  and  $/\beta/ = \textit{good}$ , the former will be allowed to override the latter, and so for suppletive spellouts in general. In sum, the FR requires us to be faithful, i.e. to stick to a particular spellout as long as we can, once we have made a Free Choice to insert it at the lowest level of spellout.

Let us now turn to the second problem, namely how to allow for a Free Choice among lexical items. Currently, Free Choice at  $\sqrt{P}$  is unavailable because of the Elsewhere Principle (EP), which governs competition between lexical items, and restricts the choice to roots of the *kluz* class, to the exclusion of adjectives that spell out QP, C1P, or C2P. With the FR in place, we have even limited the options further, since once a lexical entry of the size  $\sqrt{P}$  (like *kluz*) has been selected, the FR prevents us from overriding this later by any other adjective than the one originally inserted. The solution to this conundrum, we propose, is to give up the EP: at  $\sqrt{P}$ , Free Choice applies (see also Harley 2014), and the subsequent derivation must be faithful to the original choice. This means that any of the four types of adjectives listed in (81) can be inserted at  $\sqrt{P}$ . This will steer the derivation in the right direction, with (last resort) movement derivations for smaller roots (like *kluz*), or nonmovement ones for larger types of roots.

Does the EP have a role to play in the rest of the derivation? We will argue that the answer is no. To see where the EP has traditionally been relevant, consider the competition between lexical items like *good* and *bett-*. Imagine, for instance, that *good* was specified as QP, and *bett-* as C1P, but without a pointer. In such case, *good* and *bett-* would both be candidates for the spellout of QP, and we would need the EP to select *good* and rule out *bett-*. The EP does that by choosing the candidate which is more specific, i.e. has fewer superfluous features; this prefers *good* and rules out *bett-*. Can we do without the EP here as well? The answer to this question is already in place. Recall that earlier we suggested an interpretation of pointers which implies that a lexical item with a pointer is only a candidate for spellout if the item pointed to has been spelled out at the lower cycle. This will in fact eliminate *bett-* from the set of candidates for spellout at QP, since *good* needs to be spelled out first. Only after C1 is merged, can



In sum, we have put in place a system where the EP is dispensed with. This allows Free Choice for roots at the bottom of the derivation, depending on ‘free will’, i.e. what one wants to talk about. Further derivations are restricted by the syntactic shape of the root one has chosen: if it is big, it can grow larger than if it is small. In either case, when the structure available in the root is all ‘used up’ by the syntactic structure, a number of things can happen as the syntactic tree grows further. The first possibility is that the current spellout is overridden by a suppletive form. The second is that snowball movement applies, and the newly merged feature is spelled out by an additional lexical item (i.e. a suffix). This will now be allowed despite the FR, since snowball movement does not lead to Cyclic Override, but the agglutination of exponents. The third possibility is that a new derivation is started in a separate workspace, and merged as a prefix later on. This will also respect the FR in that no Cyclic Override takes place (except internal to the prefix, but this is then subject to the FR).

## 7 Suppletion meets negation

### 7.1 The data

In this section, we discuss some data from Czech comparatives, which will lead to a further refinement of the theory presented so far. The data pattern we want to explain is given in (89). It concerns the interaction of root suppletion with negation.

(89)	POS	CMPR	
	dobr-ý	<b>lep-š-í</b>	‘good-better’
	mal-ý	<b>men-š-í</b>	‘small(er)’
	ne-dobr-ý	*ne- <b>lep-š-í</b>	‘bad-worse’
		ne-dobř-ej-š-í	
	ne-mal-ý	ne- <b>men-š-í</b>	‘not small(er)’
		*ne-mal-ej-š-í	

We focus here on the adjectives *dobr-ý* ‘good’ and *mal-ý* ‘small,’ which both show root suppletion in the comparative, as shown on the first two rows. Both adjectives may be preceded by the negative prefix *ne-* in their positive degree, but a puzzling asymmetry arises in the comparative. With *ne-dobr-ý* (literally ‘NEG-good’), comparative suppletion is impossible, and

the comparative is formed entirely regularly, i.e. with the nonsuppletive root; see the middle two rows. With *ne-mal-ý* ‘NEG-small,’ on the other hand, the suppletive root continues to be used in the comparative.

The allomorphs of the comparative marker are well-behaved in the sense that a suppletive root (where available) is only compatible with a single marker (-š-), whereas the non-suppletive root combines with both markers (-ěj-š-). In this section, we show that an account of this complex set of contrasts is possible using the various ingredients concerning suppletion and allomorphy that we presented above.

## 7.2 *The analysis of Neg-good-er*

As a first step in our explanation of the pattern in (89), we need to consider the question of the internal structure of NEG + *adjective* + CMPR. Since the affixes occur on either side of the head, two bracketings are in principle possible, as shown in (90).<sup>18</sup>

- (90) a. [[ne-dobř-]ejš]  
 b. [ne-[dobř-ejš]]

These bracketings correspond to the two different readings in (91): in the first one, the comparative has scope over the negation, in the second, negation has scope over the comparative.

- (91) a. [ MORE [ NOT good ] ]  
 b. [ NOT [ MORE good ] ]

The two readings are semantically distinguishable in contexts where A and B are equally good/bad, in that only (91b) can describe such a situation. The bracketing (91a), on the other hand, necessarily requires that there be a difference in the level of badness of the individuals compared. Now consider (92):

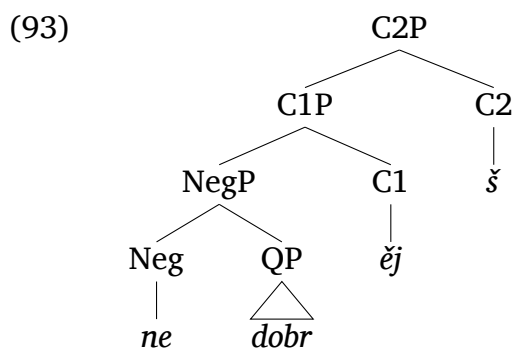
- (92) Mé jídlo bylo nedobřejší než vaše.  
 my meal was worse than yours  
 ‘My meal was worse than yours.’

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<sup>18</sup>We ignore the possibility here that *ne* structurally intervenes between C1 and C2 (but see the discussion of *unhappier* below).



The sentence (92) is incompatible with a situation where both meals are equally bad. This shows that the structure (91a) is the correct semantic bracketing for *ne-dobř-ejší* ‘un-good-er.’ We take this to indicate that the functional sequence provides a position for negation between QP and C1 (which marks the beginning of the comparative domain). Translating these findings into a simplified tree representation is straightforward:



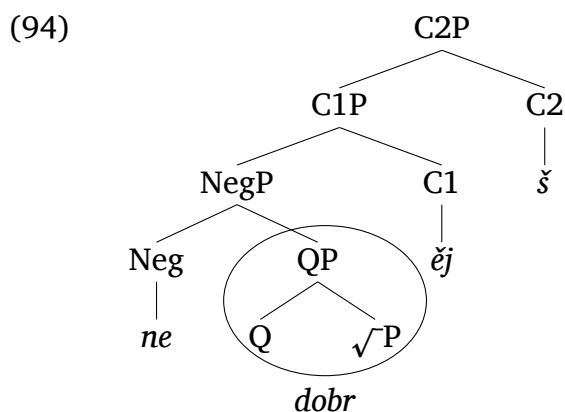
We will get back to the step-wise derivation of such a tree below, once a couple more observations are in place. For now, we want to point out that when a negation intervenes structurally between the root and the comparative, suppletion is blocked. This effect has been traditionally attributed to the so-called Adjacency Condition (Siegel 1978, Allen 1978, Bobaljik 2012), which restricts allomorphic variation to items that are structural neighbours (see Moskal & Smith 2016 for an alternative approach with a similar effect). With the negation intervening, the C1 head (which triggers root suppletion) is not structurally adjacent to the root, and suppletion becomes impossible. For us, this effect falls out from the Superset Principle: the lexical entry for *lep-* does not contain Neg, and hence, it cannot spell out a C1P which contains such a head. The difference between the traditional approach and our model is that our approach yields the Adjacency Condition as a theorem: if comparative suppletion is a by-product of phrasal spellout, it follows that when there is a marker which is structurally located in between the root and one of the comparative heads, the root cannot be suppletive. There is no need to state the ‘Adjacency Condition’ over and above the theory we have developed up to now.

In addition, we observe that when the root of an adjective that normally shows suppletion is not suppletive, and defaults to the positive degree shape, C1 and C2 become available for insertion, leading to the pro-

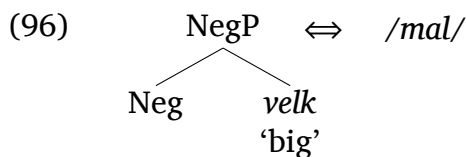
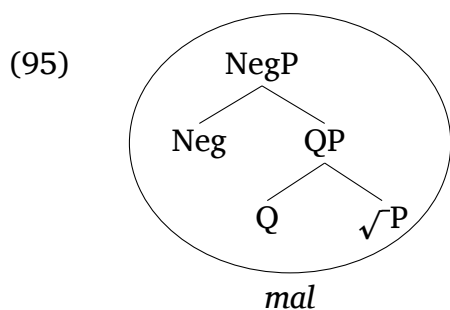
ductive, bi-componential *-ěj-š-* marker. This highlights the correlation between suppletive roots (like *lep-*) and the absence of marking for the head C1, a fact that directly falls out from an analysis where suppletion is the result of portmanteau spellout of C1P.

### 7.3 The analysis of *Neg-small-er*

We now proceed to the suppletive pair *ne-mal-ý/ne-menší* ‘not small(er)’. We start the discussion with tree for the form *ne-dobř-ěj-š-í* from (93), but adjusted to reflect the fact that *dobr* is the phrasal spellout of QP:



An option allowed by our system is that there could be lexical items which spell out the NegP of (94) in one piece. We will claim here that such items indeed exist, and that they correspond to the so-called negative adjectives, such as *mal-(ý)* ‘small’, which we will analyse as a negative counterpart to ‘big’ (similarly to Bobaljik 2012:ch.7). The full structure such adjectives spell out is thus shown in (95), but technically, we will analyse them as related to their positive counterparts via a pointer, as in (96).

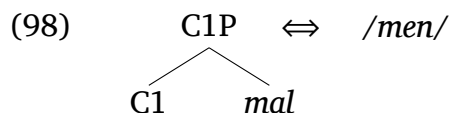


Aside from its conceptual plausibility, we believe that there are also empirical arguments supporting this idea. The empirical argument is the well-known observation that *un*-prefixation is systematically impossible with negative adjectives, as opposed to positive ones (Jespersen 1942:466, Zimmer 1964; Horn 1989:275; Horn 2005).<sup>19</sup>

(97)	POS A	NEG A
	unhappy	*unsad
	unwise	*unfoolish
	unclean	*undirty
	unfriendly	*unhostile
	unhealthy	*unsick
	unkind	*unrude
	untrue	*unfalse

This asymmetry shows that there is a distinction between positive and negative adjectives, which we believe can be accounted for by assuming that negative adjectives spell out a Neg feature. The same feature being spelled out by the negative prefix, the items in the second column are ruled out because the same Neg feature would need to be spelled out twice (see De Clercq & Vanden Wyngaerd 2017b for extensive discussion of this and related cases).

Importantly, treating *mal-ý* ‘small’ as a negative adjective will give us a handle on the contrast in (89). Suppose then that the adjective *mal-ý* is lexically specified as in (96), and that its suppletive comparative counterpart *men-* spells out an additional C1 head. Since it is suppletive for *mal-*, we assume that its lexical entry contains a pointer to *mal*, as in (98):

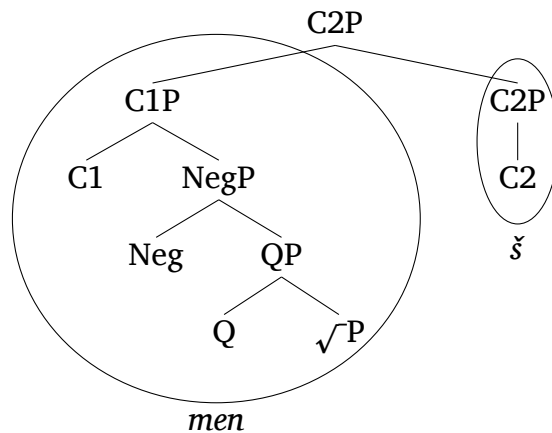


Putting this all together, we get the structure in (99) for the suppletive comparative form *men-š* ‘smaller’:

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<sup>19</sup>We present English data here because this has been discussed most widely in the literature, but the facts are the same for a wide range of languages, including Czech.

(99)



Given this proposal, the negative prefix in *ne-menší* ‘not smaller’ cannot be in the same position that it occupies in *ne-dobřejší* ‘worse’, since in *ne-menší* the relevant Neg head is already spelled out by the root *men-*. The obvious alternative is that the negative prefix in *ne-menší* ‘NEG-small-er’ should scope over the comparative, thereby contrasting with *ne-dobřejší*:

- (100) a. [[ne-dobř]ejš] = [MORE [NOT GOOD]] (i.e. ‘worse’)  
b. [ne-[men-š]] = [NOT [MORE SMALL]] (i.e. ‘not smaller’)

This prediction is indeed borne out: *ne-menší* means ‘not smaller’, and is compatible with a situation where the items being compared are equally big. For instance, the following sentence is compatible with a scenario where Jan and Petr donate an equally large sum of money.

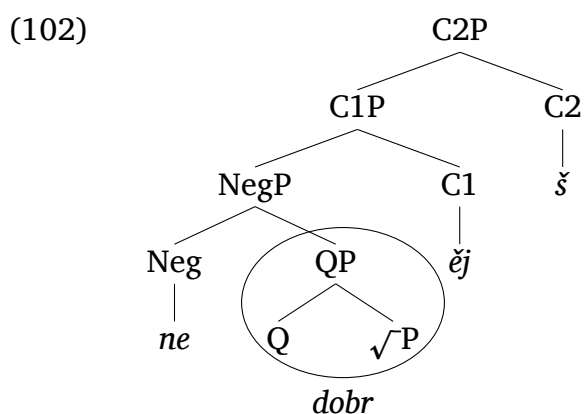
- (101) Jan věnoval velkou částku a Petr ne-men-ší.  
Jan donated large sum and Petr NEG-small-CMPR  
‘Jan donated a large sum of money and Petr the same or more.’

In sum, the negative marker with positive adjectives spells out a Neg feature that takes scope below the comparative, and therefore, blocks suppletion. Negative adjectives, on the other hand, spell out the same Neg feature inside their root. As a result, an overt negative marker with a negative adjective like *mal-ý* ‘small’ must spell out a Neg feature that takes scope over the comparative, and consequently, does not interact with suppletion. The differing scope relations are reflected also in the meanings of the relevant comparative forms: one form (*ne-dobřejší* ‘un-good-er’) is a (regular) comparative of a negative adjective, the other form (*ne-menší*)

‘not-smaller’) is the negation of a comparative.

#### 7.4 Revising the spellout algorithm

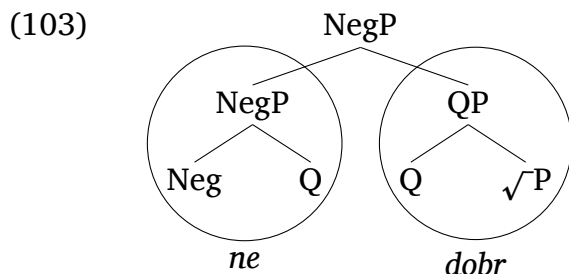
After we have shown what the structure of *nemenší* ‘not-smaller’ looks like, let us present some more interesting details about the derivation of *ne-dobř-ej-š-í* ‘un-good-er.’ The structure we presented in the previous section looked as follows:



What we now want to show is that this structure—which we believe to be essentially correct—poses an interesting challenge for our theory of spellout driven movement as formulated in section 3.

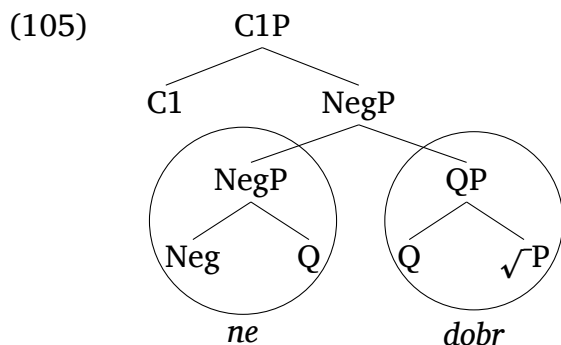
In order to show that, let us go step by step through the derivation. We first merge features all the way to QP without moving anything, since QP can be spelled out by the root *dobr* ‘good.’ Once Neg is introduced, *dobr* cannot be extended to spell out NegP, since its entry does not contain Neg. Movement operations are triggered in order to save the derivation: first trying to move the highest feature (i.e., Q) across Neg, then QP across Neg, but these both fail. As a last resort, a complex Spec is constructed, merging Neg with Q and adding this to the main derivation. We assume that this is the (minimal) structure that the negation marker in Czech lexicalises, as shown in (103), with the actual lexical entry in (104).<sup>20</sup>

<sup>20</sup>There is a note of caution to be made here. In principle, we expect that an adjective such as ‘bad’ (with the entry [Neg good]) would apply at NegP without any movements. While we want to maintain the idea that ‘bad’ may actually block ‘un-good’ (as we think it does in English), this blocking must allow for some exceptions, because both *ne-dobr-*



(104)  $[_{\text{NegP}} \text{Neg Q}] \Leftrightarrow ne$

When C1 is added, the first attempt is to put it in the Spec, but this combination fails to be lexicalised. Therefore, the specifier workspace is closed, and the whole structure (103) is embedded under C1, as shown in (105).



There is no lexical item that spells out the whole C1P, and rescue movements take place. Recall the spellout algorithm from (49), repeated here:

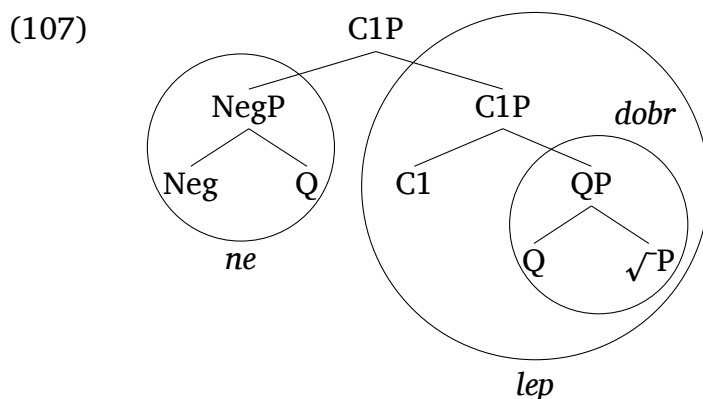
- (106) Merge F and  
 a. Spell out FP

---

‘un-good’ and *špatn-* ‘bad’ exist side by side in Czech (compare similar English pairs like *false-untrue*). There are several technical ways to achieve this, and we are not sure at the moment which of these is correct. One option would be that the Czech lexicon contains a redundancy that the English lexicon does not. Concretely, ‘bad’ in Czech (but not in English) would be related to a positive adjective which would be very similar to ‘good’, but differ from it in never surfacing (e.g. in virtue of lacking a phonology). Its only purpose would be to set the stage for ‘bad’ (so that ‘bad’ would arise as a negative version of this particular adjective and not of ‘good’). Another option would be to say that for reasons to be understood, speakers may vary the size of their lexicon depending on the occasion. If ‘bad’ could be suppressed from the lexicon on a given occasion, this would lead to the rescue scenarios we are describing in the main text. We leave this issue open for future research.

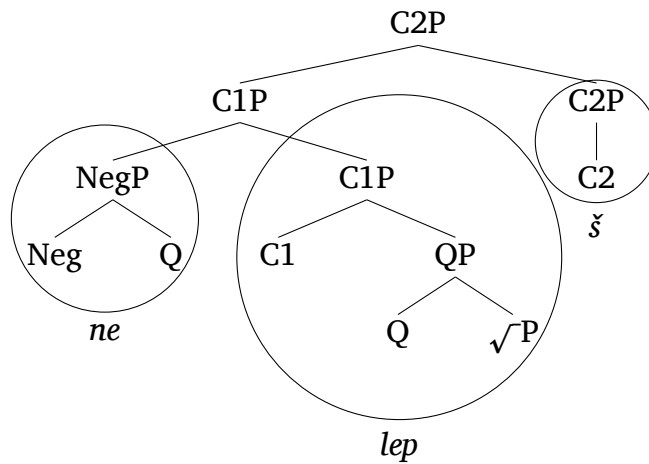
- b. If (a) fails in the second workspace, undo merge F, and close the workspace by merging it with the main derivation; retry Merge F.
- c. If (a) fails in the main space, attempt movement of
  - (i) the spec of the complement of F, and retry (a)
  - (ii) the complement of F, and retry (a)
- d. If (c) fails, spawn a new derivation by merging F with the last successfully spelled out feature, i.e.  $F^{-1}$ , and retry (a).

Since (106a) fails, rescue movements in (106c) take place. First we try spec-to-spec movement (106c-i), which moves the spec of the complement of C1, i.e. NegP, above C1, creating the structure (107), where the remnant C1P can spell out as *lep-*, which overrides the earlier spellout *dobr-*:



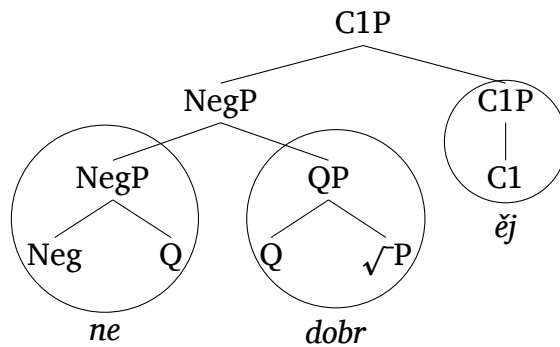
However, this ultimately gives the wrong result. After C2 is added on top of (107), there is no single item for the whole structure. Hence, once again, we try to move out NegP ('the node inserted at the previous cycle'), but now there is no entry for the whole C2P (recall that *lep-* is specified as C1 + QP). Hence, we snowball the whole complement of C2P, which yields the structure (108). This structure can be lexicalised, with the remnant C2P spelled out by *-š*. In other words, on the basis of the spellout algorithm given in (106), we wrongly expect the form *ne-lep-š-í*:

(108)



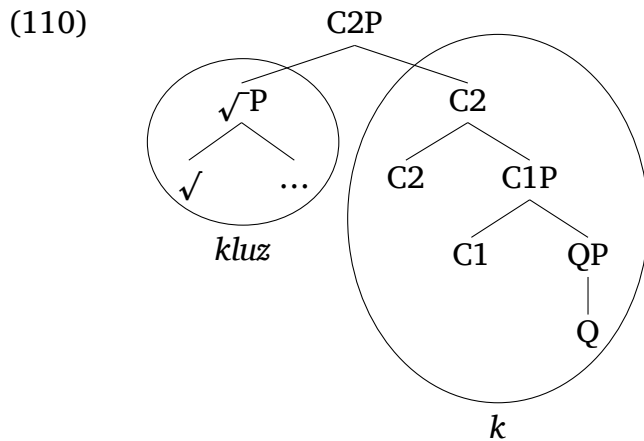
The derivation that leads to the correct result would take (105) as a starting point, and instead of moving the Spec (i.e., NegP), it would move the whole complement, as in (109). This derivation lexicalizes as *ne-dobř-ej*, which then ultimately yields the correct form *ne-dobř-ej-š-í* (after merging C2 and applying unsuccessful spec-to-spec movement of NegP, followed by successful rollup movement of C1P).

(109)



This correct outcome could be achieved if we simply switched the order of various repair strategies in (106)/(49), and complement movement (i.e., snowball) took precedence over spec-to-spec movement. However, that cannot be so, for in section 3.2 we have concluded that the derivation of *-k* adjectives requires spec-to-spec movement to precede complement movement. We repeat the relevant structure in (110):





What we need here is that the root moves cyclically spec-to-spec from the complement of Q position all the way above C2. If complement movement was preferred over spec-to-spec in this case, we would expect agglutinative comparatives of the sort *kluz-č-ěj-š-í*, which are not found. The solution to this conundrum is that there are actually two slightly different scenarios that we have conflated under the label of spec-to-spec movement. Specifically, while the  $\sqrt{P}$  which moves in (110) starts as a complement and it never projects as a specifier, the NegP in (105) is a projecting specifier; i.e., a specifier that provides the label to the whole tree. If we separate these two different instances of spec-to-spec movement also in the spellout algorithm, the problems disappear. Specifically, if the movement of a non-projecting Spec takes preference over complement movement, we can still maintain the derivation in (110). At the same time, if complement movement takes precedence over the movement of a projecting specifier, then we can also encode the preference for the derivation in (109) over (105). The full algorithm is given below, and it delivers the correct result for all the cases we have discussed up to now. The new thing is the separation of the two types of Spec movement:

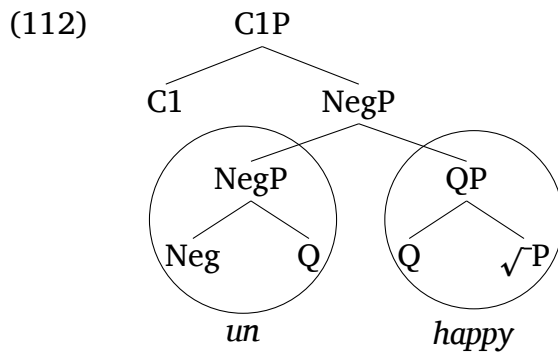
- (111) Merge F and
- a. Spell out FP
  - b. If (a) fails in the second workspace, undo merge F, and close the workspace by merging it with the main derivation; retry Merge F.
  - c. If (a) fails in the main space, attempt movement of
    - (i) the non-projecting spec of the complement of F, and

- retry (a)
- (ii) the complement of F, and retry (a)
- (iii) the projecting spec of the complement F, and retry (a)
- d. If (c) fails, spawn a new derivation by merging F with the last successfully spelled out feature, i.e.  $F^{-1}$ , and retry (a).

### 7.5 The derivation of *un-happy*

In this section, we detail the working of the algorithm on negative adjectives in English. The discussion will provide evidence for the projecting spec movement, i.e. (111c-iii) (which we did not need in Czech). The presence of this movement in English correlates with an empirical difference between Czech and English: while in Czech, *un-* prefixation changes the allomorphy of the comparative marker, we find a ‘bracketing paradox’ in English, where *un-* moves (as we will argue), and appears to attach to the whole comparative.

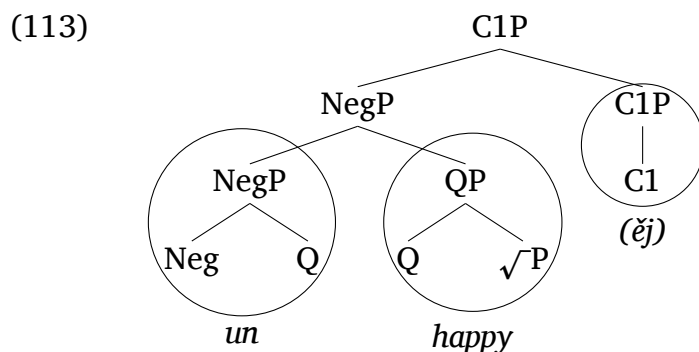
We start the discussion at the stage of the derivation where we have derived the negative adjective *un-happy*, and we add the first comparative head C1. This stage is common to English and Czech, because their lexical items for adjectives and the negative marker have the same shape, with negation a prefix on the adjective. The actual phonology is of course different.



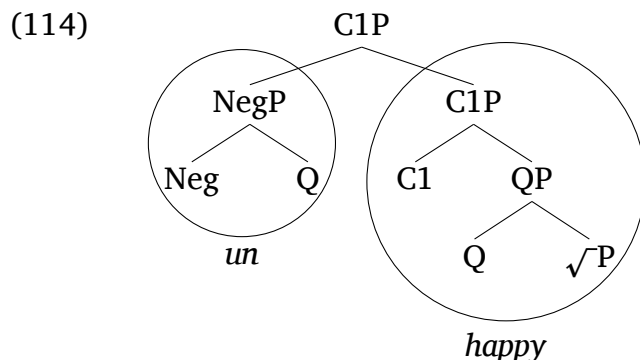
There is no single entry to spell out this structure. Although English *happy* can spell out C1P given that it has a morphological comparative (see the discussion in section 4 above), its entry cannot spell out C1P in (112) because of the intervening NegP. Now ordinarily, we would expect this to lead to the formation of a syntactic comparative, as in the case of *intelli-*

*gent*, which spells out only QP, so that *more* is needed to spell out C1 + C2. But this is not what in fact happens, and the reason is that there is a derivational option which moves the NegP out of C1P, so that *happy* spells out C1P and *-er* the remaining C2 feature. Let us go through this derivation in detail.

The first option we must try according to (111) is to move a non-projecting Spec. However, there is no such spec in (112), so this option is skipped. The next repair attempt is to move the complement, which leads to the structure in (113). Lexicon is then searched for items that match C1P (circled), but there is no such item in English (recall that *-er* spells out C2 only). Czech has the marker *-ěj* here, which spells out C1P, as already shown in (109).

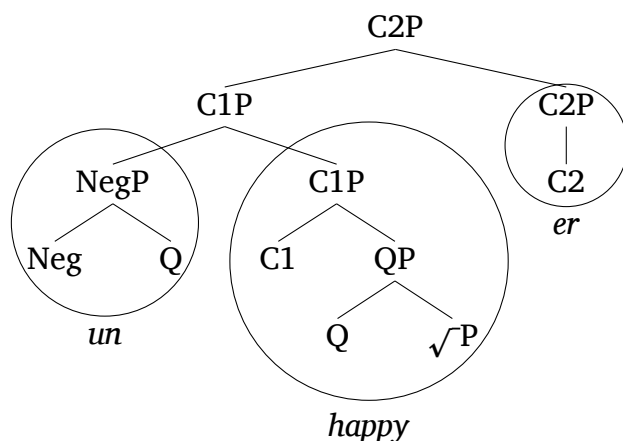


The final movement strategy is to move the projecting Spec, leading to the structure in (114). This yields a successful spellout of C1P by *happy*, with *un-* pushed out. A bracketing paradox is created:



When C2 is added, the derivation ultimately leads to the structure in (115):

(115)



This is the same structure that we have already considered for Czech, recall (108). Interestingly, while this structure was incorrect for Czech, it is the correct structure for English. The difference is caused by the fact that in English, there is no spellout for the step in (113); as a consequence, the negation *un-* is ultimately pushed out from its base position, which leads to the result that in English, the prefix *un-* never influences the shape of the comparative. In Czech, on the other hand, there is a spellout for the step of the derivation shown in (113); as a consequence, the negation stays in its base position and acts as an intervener for phrasal spellout of C1P. This way, the difference between Czech and English (once again) falls out from the difference in the shape and size of the lexical entries.

## 8 Conclusion

In this paper, we proposed an articulated structure of the comparative in terms of two distinct heads, C1 and C2. We presented morphological evidence from Czech in support of these heads, and developed an analysis of root suppletion that makes crucial use of them. In particular, we proposed to reduce all forms of suppletion to portmanteau suppletion, and discussed a generalisation (the *Comparative Suppletion Generalisation*) which this move gives rise to. Our analysis heavily relied on the idea that adjectival roots come in varying sizes. This required us to introduce a Faithfulness Restriction, which takes over most of the work done by the Elsewhere Principle, which can consequently be dispensed with. We further investigated the interaction of negation with comparative morphology, arguing

that negative markers and negative adjectives contain a Neg feature. This allowed us to explain a remarkable pattern of comparative root suppletion in combination with a negative prefix that was found Czech. We were able to achieve all these results relying on the decomposed comparative structure and its interaction with the language particular shapes of lexical entries, which may influence the way derivations unfold via the mechanism of spellout driven movement.

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