

# Degree Morphology

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## Abstract

This chapter provides a chronological overview of the treatment of degree morphology in the generative literature from the 1970s until today. Starting out from Ultan's (1972) four basic degrees of comparison, it initially widens the scope to consider other types of degree morphology. It then hones in on the expression of the positive, comparative and superlative degrees, and the way these are related to one another. It is shown how the functional superstructure of the adjective became increasingly fine-grained, with the earliest proposals (Bresnan 1973, Corver 1997) involving a partitive layer (QP) with a degree determiner (DEG) on top of the lexical adjectival core. It is then shown how DEG is split up into CMPR and SPRL in the work of Bobaljik (2012), which is based on attested and unattested patterns in root suppletion in the triplet positive-comparative-superlative. Nanosyntactic treatments are discussed, which decompose Bobaljik's heads even further, on the basis of evidence from Czech comparatives and Latin superlatives. Finally, the particular position of the positive degree is discussed, in particular its relation to the comparative, both with respect to their morphological marking and their underlying structural and semantic relationship.

# 1 Setting the scene

This section aims at providing a broad overview of the land of degree morphology, starting from one of the earliest formal treatments of adjectival degree comparison, Ultan (1972). We then widen the perspective to all types of degree marking, finally honing in again on degree morphology.

Ultan (1972: 120) distinguishes four ‘degrees of predicative comparison’:

- (1) a. POSITIVE           The Matterhorn is **high**.
- b. EQUATIVE        The chair is **as high as** the table.
- c. COMPARATIVE    The Weisshorn is **higher than** the Matterhorn.
- d. SUPERLATIVE    Mount Everest is **the highest** mountain.

All degrees involve a subject (SUBJ) and a dimension (DIM); the degrees other than the positive add a degree marker (EQD, CMPR, and SPRL), a marker of the standard (STM), and the standard (STD) itself, as shown in (2).

- (2) a. The chair is as high as the table.  
     SUBJ           EQD DIM STM STD
- b. The Weisshorn is high -er than the Matterhorn.  
     SUBJ                   DIM CMPR STM STD
- c. Mount Everest is the high -est of all mountains.  
     SUBJ                   DIM SPRL STM STD

Semantically, the equative marks parity of degree, whereas comparatives and superlatives mark disparity. The comparative makes a binary comparison between two individuals, whereas the superlative (implicitly) involves the conjunction of a binary comparison with each member of the standard class (Ultan 1972). Ultan raises the question whether the positive is really a degree, since it is, according to him, never overtly marked. At the same time, he notes that the positive degree semantically always involves an implicit comparison with respect to the members of a standard class as a whole. That is, the positive degree may be characterised as a covert comparative, the meaning of (1a) being paraphrasable as in (3).

- (3) The degree of the Matterhorn’s height is bigger than [<sub>STD</sub> some contextual standard].

Before moving on to other types of degree marking, we wish to point out two special types of comparison, the cross-scalar comparison on the one hand, and the metalinguistic comparative on the other. The first type is illustrated in (4) (examples from Bresnan 1973: 322 and Kennedy 2001: 37, respectively):

- (4) a. The table is longer than the door is wide.  
b. The table is as long as it is wide.  
c. The space telescope is longer than it is wide.

In (4a-b), the degree of the table on the length scale is compared with a degree on the width scale. Although these look, at first blush, like different scales, for the comparison to be possible at all, they must, at some level of abstraction, involve scales that refer to the same dimension. This type of comparison is limited to the comparative and equative degrees.

The metalinguistic comparative is illustrated by the example in (5a) (from Bresnan 1973: 275). Such examples are special in that they do not permit morphological marking (5b), and the analytic marker may follow the adjective (5c).

- (5) a. I am more angry than sad.  
b. \*I am angrier than sad.  
c. I'm sad more than angry.

Also, nongradable adjectives like *financial* do not allow regular comparatives, (witness (6a)), but they may occur in metalinguistic comparison, see (6b), (from McCawley 1998: 673):

- (6) a. \*Your problems are more financial than mine.  
b. Your problems are more financial than legal.

In languages like Dutch or French, the (analytic) comparative marker can translate with an adverb meaning 'sooner' (the regular analytic marker of the comparative, respectively *meer* and *plus* 'more', are also possible, albeit only preceding the adjective):

- (7) a. Jouw problemen zijn **eerder** financieel dan juridisch.  
Your problems are sooner financial than legal  
b. Tes problèmes sont financiers **plutôt** que juridiques.  
Your problems are financial sooner than legal

‘Your problems are more financial than legal.’

Semantically, they do not involve a comparison of degrees, but of appropriateness, as pointed out by Embick (2007: 18): (7b) ‘is a metalinguistic comparative, one that means that it is more appropriate to call your problems financial than it is appropriate to call them legal’.

When semantics and modification of the positive are taken into account, more distinctions appear than those made by Ultan. Here are eight additional constructions, expressed by modifiers in English (see also the broader list of adjectival degree words in Bolinger 1972).<sup>1</sup>

- |     |    |               |   |
|-----|----|---------------|---|
| (8) | a. | SUFFICIVE     | The Karjiang is just <b>high enough</b> to be in the top 100 of highest mountains.      |
|     | b. | EXCESSIVE     | Mount Everest is <b>too high</b> to climb without oxygen.                               |
|     | c. | AUGMENTATIVE  | The outcome is <b>very/extremely/highly uncertain</b> .                                 |
|     | d. | DIMINUTIVE    | The claim is <b>a bit/slightly/somewhat exaggerated</b> .                               |
|     | e. | MEASURE       | Mount Logan is <b>5,959m high</b> .   |
|     | f. | DEMONSTRATIVE | The mountain is <b>so/that/this high</b> .  |
|     | g. | INTERROGATIVE | <b>How high</b> is the Annapurna?   |
|     | h. | RELATIVE      | The Weisshorn is higher than the degree <b>to which</b> the Matterhorn is <b>high</b> . |

The excessive and sufficive degrees resemble the comparative in that they compare two entities with respect to a degree on a dimension, with the infinitival clause the expression of the standard (Meier 2003, Hacquard 2005). They both imply that the entity in the subject position exceeds the standard. They are different in that the excessive tends to be evaluatively negative, whereas the sufficive is generally evaluatively positive. The augmentative and the diminutive degrees are also closely related, indicating high and low degree, respectively. As with the positive degree, they involve an implicit comparison with a standard. The measure and the demonstrative degrees, which specify a precise degree, may be viewed as covert equatives (‘The mountain is as high as this/5,959m’). The inter-

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<sup>1</sup>The terminology that we use in (8) to refer to the various degree types are in part taken from the literature, and in part of our own making.

rogative asks for a degree. The relative degree refers to the degree in the standard of the comparative and equative degrees. It can occur in a relative clause, as in (8h), but equative and comparative sentences with an overtly marked standard (as in (1)) have been argued to contain a relative degree as well, which is mostly invisible due to comparative deletion (Bresnan 1973). However, some languages mark it overtly with some form of relative marker, as in the English example with overt relative clause structure in (8h). In Italian, for example, the relative degree marker is syncretic with the interrogative degree marker, as shown in (9) (E. Cavirani, p.c.). In Afrikaans, the relative degree marker *wat* is syncretic with the relative pronoun, as (10) shows (Den Besten 1981).

- (9) a. **Quanto** è alta Maria?  
How is.3sg tall.F Maria  
'How tall is Maria?'
- b. Maria è più alta di **quanto** è alto Giovanni.  
Maria is.3SG more tall.F than how is.3SG tall.M Giovanni.  
'Maria is taller than Giovanni.'
- (10) a. die vrou **wat** so kwaad is  
the woman that so angry is  
'the woman that is so angry'
- b. Sy het vinniger geloop as **wat** ek gehardloop het.  
she has faster walked than what I run have  
'She walked faster than I ran.'

In Hungarian, the relative degree marker is based on the interrogative marker, but adds the prefix *a-*, which regularly derives relative pronouns from interrogative ones (examples taken from Bacskai-Atkari 2018: 85; 7):

- (11) a. **Milyen** magas volt Péter?  
how tall was.3SG Peter  
'How tall was Peter?'
- b. Mari magasabb, mint **a-milyen** magas Péter.  
Mary taller than how REL-tall Peter  
'Mary is taller than Peter.'

Based on this discussion it must be clear that from the point of view of the semantic characterisation of degrees, Ultan's list in (1) can be ex-

panded on substantially.

Returning to the topic of degree morphology, morphology plays a part in more than just the four degrees of comparison of Ultan. It is common in the literature to distinguish synthetic (or morphological) marking of degree from analytic (or syntactic) marking. Both forms are obviously available for the comparative and superlative degrees, where the distinction analytic-synthetic is well-known from the literature (see e.g. Bobaljik 2012, Caha 2017b).

As far as the equative degree is concerned, Haspelmath & Buchholz (1998: 283) show that adjectival equative marking can be analytic or synthetic (see also Cuzzolin & Lehmann 2004). Languages that have synthetic marking of the equative include Megrelian (Kartvelian), Old Irish, Welsh, Estonian, Tagalog, Indonesian, and Greenlandic Eskimo. An example from Estonian is given in (12) (Haspelmath & Buchholz 1998: 283).<sup>2</sup>

- (12) Minu õde on minu pikk-une.  
my sister is me.GEN tall-EQD  
'My sister is as tall as me.'

Synthetic marking of the excessive degree occurs in Slovenian with the prefix *pre* (Bobaljik 2012: 2; L. Marusič, p.c.; see (13a)). Czech has what looks like a morphologically zero-marked excessive degree in the morpheme *moc* 'too much', as shown in (13b).

- (13) a. Peter je pre-debel, da bi bil jamar.  
Peter is EXC-fat that COND be caveman  
'Peter is too fat to be a caveman.'  
b. Jak moc je moc?  
how much is too.much  
'How much is too much?'

The zero nature of the Czech excessive is apparent from the comparison of the two instances of the syncretic marker *moc*, which can either mean 'much', or 'too much.' In the first instance, it follows the question word *jak* 'how', and represents the interrogative degree (which is identical to the positive). In the second instance, the same morpheme has an excessive reading.

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<sup>2</sup>For more discussion of the equative, we refer to Henkelmann (2006), Treis & Vanhove (2017), Haspelmath & the Leipzig Equative Constructions Team (2017), Rett (2020).

The augmentative and diminutive degrees have obvious syntactic markers, but many languages also employ morphological means. The morphemes involved in the augmentative degree (sometimes also called elative) can be diachronically related to superlative markers, those involved in the diminutive degree can be related to nominal markers of the diminutive.

An example of a morphological augmentative is Italian *buon-issim-o* ‘very good’. Historically a marker of the superlative in Latin (see section 4), the *-issim* morpheme no longer marks the superlative in Italian. The superlative is now analytically expressed for most adjectives (e.g. *la piú bella* ‘the most beautiful’), but *buono* ‘good’ has a suppletive form in the comparative, which also appears in the superlative (*il migliore* ‘the best’). Russian has a series of augmentative markers, like *-(j)učš*, *-enn*, and *-ajš/-ejš*:<sup>3</sup>

- |      |    |           |               |                    |
|------|----|-----------|---------------|--------------------|
| (14) | a. | žadn-ij   | žadn-jučš-ij  | ‘extremely greedy’ |
|      | b. | tolst-ij  | tolst-učš-ij  | ‘extremely fat’    |
|      | c. | širok-yj  | široč-enn-yj  | ‘extremely large’  |
|      | d. | tiažel-yj | tiažel-enn-yj | ‘extremely heavy’  |
|      | e. | kratk-ij  | kratč-ajš-ij  | ‘very short’       |
|      | f. | dobr-yj   | dobr-ejš-yj   | ‘very kind’        |

The last one of these markers (*-ajš/-ejš*) is historically a comparative marker, too, cf. the Old Church Slavonic comparative *star-ěiš-i* ‘older, FEM’ from *star-ъ* ‘old’ (Lunt 2001: 78; see also the discussion of Old Church Slavonic in Caha et al. 2019a).

Other languages with morphological augmentative markers include Turkish (Türk 2020) and Modern Greek (Efthymiou 2015). Ancient Greek is also the source of the augmentative prefix *mega-*, which is a morphological marker of the augmentative in many languages of Europe (comparable to *ultra-*, which has a Latin origin).

Diminutive degree morphemes are also found in Russian, like *-en’k/-on’k* and *-ovat/-evat*:

- |      |    |          |               |                   |
|------|----|----------|---------------|-------------------|
| (15) | a. | tolst-yj | tolst-en’k-ij | ‘slightly fat’    |
|      | b. | xud-oj   | xud-en’k-ij   | ‘slightly thin’   |
|      | c. | sladk-ij | sladk-ovat-yj | ‘slightly sugary’ |
|      | d. | sux-oj   | sux-ovat-yj   | ‘slightly dry’    |

<sup>3</sup>For help with the Russian data, we are grateful to A. Vyshnevska (p.c.).

Modern Greek also features a series of diminutive markers (Efthymiou 2015).

The Czech diminutive marker *-in/oun* has a primarily emotive function when it occurs with proper names.<sup>4</sup> The same marker can also occur with adjectives, where it has, among others, an endearing function, reflecting a positive sentiment towards the addressee. They can be appropriately used, e.g., in a parent–small child conversation (e.g. (16a-b)). Such emotive meanings are, in fact, common with the kinds of diminutive and augmentative markers under discussion here. In addition, *-in/oun* shows sensitivity to the polarity of the adjective. With negative adjectives, it has an augmentative sense, as shown in (16c-d), which is absent with positive adjectives such as those in (16a-b).

- (16)
- |    |          |                 |              |
|----|----------|-----------------|--------------|
| a. | tepl-ý   | tepl-oun-k-ý    | ‘warm, cosy’ |
| b. | slad-k-ý | slad-oun-k-ý    | ‘sweet’      |
| c. | krat-k-ý | krať-oun/in-k-ý | ‘very short’ |
| d. | mal-ý    | mal-in-k-ý      | ‘very small’ |

Such sensitivity to the polarity of the adjective, or to properties of the scale with which the adjective is associated, is also common in other degree markers (see e.g. Rotstein & Winter 2004, Kennedy 2007, Bylinina & Zadorozhny 2012, De Clercq & Vanden Wyngaerd 2019 for discussion and examples).

A potential candidate for a morphologically marked measure and/or interrogative degree is the zero interrogative degree found in Northern Norwegian, as described in Svenonius & Kennedy (2006). In the dialects they discuss, a polar question can be interpreted as asking for a degree, as in the following examples:

- (17)
- |    |                                    |
|----|------------------------------------|
| a. | Er du gammel?                      |
|    | are you old                        |
|    | ‘How old are you?’                 |
| b. | Er det langt til Nordkapp?         |
|    | is it far to north.cape            |
|    | ‘How far is it to the North Cape?’ |

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<sup>4</sup>For instance, the Czech name *Luc-k-a* (a diminutive-hypocoristic of the female name *Luci-e*) has a special endearing form *Luc-in-k-a*. Kinship terms also follow this pattern, *mam-k-a* (a diminutive of *mám-a* ‘mother’) has an endearing form *mam-in-k-a*.



Since this type of zero-marking is only possible with adjectives that allow measure phrases (e.g. *5 years old*, but not *\*2kg heavy*), they postulate a zero *Meas* head with them, as well as a null interrogative operator. A similar kind of zero marking is frequently found with the relative degree (recall the discussion of comparative deletion above).

As a final issue in this section, we want to briefly comment on a matter that will become relevant in the next section in particular, where we shall distinguish several types of degree marking. This concerns the way these different types of degree marking combine with one another. As a first approximation, we may state that no two types of degree marking stack onto each other. This suggests that they belong to the same category, which in the early literature has given rise to the postulation of a syntactic degree head inside the AP, which can host at most one degree marker (e.g. Bresnan 1973).

- (18)
- a. \*The Weisshorn is **(too) higher (enough)** (than the Matterhorn) (to VP).
  - b. \*The chair is **as higher as/than** the table.
  - c. \*Mount Logan is **very/a bit 5,959m high**.
  - d. \*Mount Everest is **that the highest**.
  - e. \*The Karjiang is **7,221m high enough** to be in the top 100 of highest mountains.

Bresnan also observed, however, that a theory with single degree head is too simple. In English, for example, measures and diminutives can stack onto comparative and excessive degrees, as shown in (19).

- (19)
- a. The Weisshorn is **28m/a bit/slightly/somewhat higher** than the Matterhorn.
  - b. The girl is **10cm/a bit/slightly/somewhat too tall** to play the part of the evil witch.

Such facts as these have given rise to the split degree hypothesis (Corver 1997), which we return to in greater detail in the next section.

Summarising, we have seen that, apart from Ultan's four degrees of comparison, there are other types of degrees, almost all of which lend themselves to morphological expression. In the remainder of this paper, we shall provide a chronological sketch of the treatment of adjectival degree marking in the history of generative grammar, showing how the

functional superstructure of the adjective became increasingly more fine-grained and detailed (sections 2 and 3). This sketch provides the backdrop to our in-depth analysis of the morphology of positive, comparative, and superlative degree marking in sections 4 and 5.

## 2 Decomposing AP

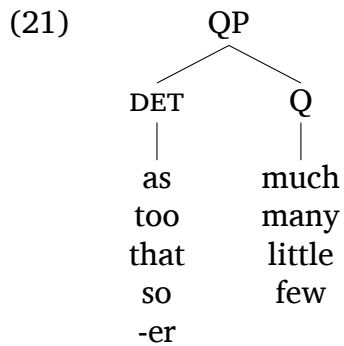
In this section we discuss how adjectival degree marking of the type discussed in examples (2) and (8) above, and in particular the comparative marker, gave rise to the decomposition of AP.

### 2.1 Bresnan (1973)

Within generative grammar, Bresnan (1973) was the first to argue for functional structure within the extended AP. In regard to the equative, excessive, demonstrative and comparative degrees discussed in (8) above, Bresnan (1973: 277) presents the data in (20) pertaining to degree comparison in the nominal domain (from Selkirk 1970):

- |      |    |      |      |        |    |      |        |        |
|------|----|------|------|--------|----|------|--------|--------|
| (20) | a. | as   | much | bread  | b. | as   | little | bread  |
|      |    | too  | much | bread  |    | too  | little | bread  |
|      |    | that | much | bread  |    | that | little | bread  |
|      |    | so   | much | bread  |    | so   | little | bread  |
|      |    | -er  | much | bread  |    | -er  | little | bread  |
|      | c. | as   | many | people | d. | as   | few    | people |
|      |    | too  | many | people |    | too  | few    | people |
|      |    | that | many | people |    | that | few    | people |
|      |    | so   | many | people |    | so   | few    | people |
|      |    | -er  | many | people |    | -er  | few    | people |

These data lead Bresnan to propose the structure in (21), with the comparative morpheme in the same slot as other degree elements, i.e. as a determiner in a QP, which in (20) is itself a subpart of the NP, but which can also occur inside VP and AP (as we shall see below).



In addition to capturing the patterns in (20), the structure in (21) also accounts for certain restrictions on the stacking of multiple degree markers, such as those in (22).

- (22)
- |            |            |
|------------|------------|
| *as more   | *as less   |
| *too more  | *too less  |
| *that more | *that less |
| *so more   | *so less   |

These facts follow on the assumption (i) that elements under the same head (either DET or Q) cannot be combined with one another, and (ii) that elements like *more* and *less* are portmanteaus combining both a DET and a Q element, as follows:

(23)

$$-er + \begin{pmatrix} \text{much} \\ \text{many} \\ \text{little} \\ \text{few} \end{pmatrix} = \begin{pmatrix} \text{more} \\ \text{more} \\ \text{less} \\ \text{fewer} \end{pmatrix}$$

The comparative forms *more* and *less* (as well as, more visibly, *fewer*) thus underlyingly consists of a partitive or quantifier-like element like *much*, *many*, *little*, or *few*, and the morpheme *-er*.

Not only is *more* derived from *much/many* and the morpheme *-er*, Bresnan's proposal also suggests that quantifiers and partitives are part of the functional superstructure of all gradable adjectives and adverbs, and not only of nouns. Under this view, the comparative forms in (24) are derived from (25).

- (24)
- a. She has more independence.
  - b. She is more independent.

- c. She is happier.
- (25)
- a. [[-er much] independence]
  - b. [[-er much] independent]
  - c. [[-er much] happy]

For Bresnan, *much* thus occurs at some point in the derivational process of both (24b) and (24c).

However, in the case of (25c), this raises the question of what happens to *much* in (24c). The same question arises for (26a), which Bresnan proposes to model by analogy with nominal degree phrases such as (26b).

- (26)
- a. \*They think she is too much happy.
  - b. They think she has too much independence.

To deal with this issue, Bresnan proposes that in APs a rule of *Much Deletion* applies, explaining why (26a) never appears at the surface.

- (27)  $much \rightarrow \emptyset / [_{AP} \dots \_\_\_ A ]$

Obviously, this rule should only apply after formation of *more*, otherwise it would be impossible to form degree phrases such as *more independent*. After cliticizing onto *much*, *-er* intervenes between *much* and the adjective and the rule in (27) will not apply.

Some problems for Bresnan's analysis, noted by Jackendoff (1977), are the fact that *much* hardly ever appears in front of adjectives, and that even though the *Much Deletion* rule captures the surface facts, this does not lead to an explanatory theory. Moreover, the strongest empirical support for the appearance of an underlying Q in adjectives, namely the optional presence of *much* with the adjectives *different* and *alike* in (28), leads to a complication of the *Much Deletion* rule, making it compulsory in most cases and optional for cases like (28) (Corver 1997: 122).

- (28)
- a. A tangerine isn't [as (much) different from an orange as I'd thought].
  - b. You and I are [as (much) alike as a horse and a cow].

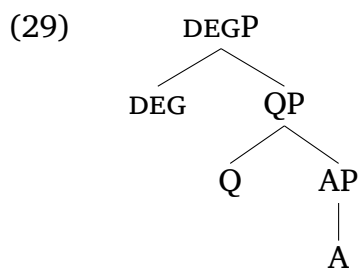
Another problem for Bresnan's account, according to Jackendoff (1977: 142), is the ungrammaticality of *\*little intelligent*. A rule of *Little Deletion* is not an option in this case for semantic reasons, because *intelligent* cannot be interpreted as 'intelligent to a little degree'. Because of these problems

Jackendoff (1977: 146-147) proposes a uniform degree hypothesis with all degree elements, including *less* and *more*, in DEG (see also Neeleman et al. 2004). He thus abandons the derivational approach for the comparative morphemes, which are the most interesting forms for the present purpose. The data in (28) should under Jackendoff's approach be regarded as having an exceptional subcategorization scheme in optionally allowing for QPs.

An alternative line of inquiry is represented by the proposal developed by Caha et al. (2019a) and De Clercq & Vanden Wyngaerd (2017), who keep the spirit of Bresnan's derivational approach for *more* and *most*, while attempting to eliminate the pitfalls of Bresnan's approach by taking recourse to a further decomposition of AP, and phrasal spellout. This line of inquiry will be informally presented and discussed at the end of section 2.2.

## 2.2 Corver (1997)

Corver (1997) challenges aspects of both Bresnan's and Jackendoff's approach. He argues that the functional degree structure of the adjectival domain is split into determiner-like degree elements, which he argues are in DEG, and quantifier-like degree elements, like *more* and *less*, which he argues are base-generated in Q. Corver sides with Jackendoff in arguing for nontransformationally derived comparative forms (because he base-generates *more* in Q), but sides with Bresnan in arguing for what he refers to as a split degree hypothesis. In addition, he also adopts a more recent version of the functional head hypothesis, which locates the lexical shell inside the functional shell, as in (29).



Crucial evidence for Corver's decomposition of the AP-domain comes from *so*-pronominalisation. The first observation is that pronominal *so* can replace an entire adjective phrase and stand on its own, as in (30).

- (30) a. John seems **fond of Mary**, and Bill seems **so** too.  
 b. John seems **too tall to serve on a submarine**, and Bill seems **so** too.

At the same time, *so* can also appear with the quantifier-like elements *less*, *more*, *enough*, as in (31) (Corver 1997: 126).

- (31) a. John is **fond of Mary**. Bill seems [**much less so**].  
 b. Of all the **careless** people, no one is [**more so** than Bill].  
 c. John is **good at mathematics**. He seems [**enough so** to enter our graduate program].  
 d. The police searched the big room **carefully**, but the small room [**less so**].

Crucially, in the presence of a subset of the degree elements, namely *too*, *as*, *so*, *how*, and *that*, *so* cannot replace the adjective in the same way as in (31), see (32).

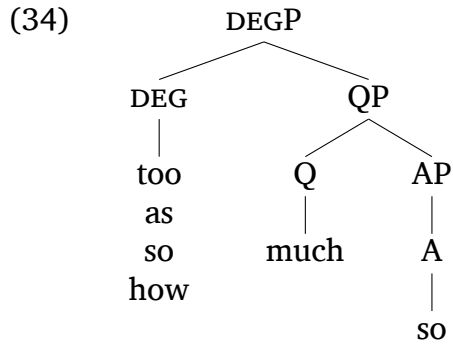
- (32) a. John is **fond of Mary**. \*Maybe he is [**too so**].  
 b. John is **fond of Mary**. \*Maybe he is [**as so** as Bill].  
 c. \*The weather was **hot** in Cairo - [**so so**, that we stayed indoors all day].  
 d. \*John told me he was **afraid of spiders**, but I wonder [**how so**] he really is.  
 e. \*John is **wild about Madonna**, but I am not really [**that so**].

Surprisingly, however, these examples become grammatical when the degree element is followed by the quantifier *much* (33) (Corver 1997: 127).

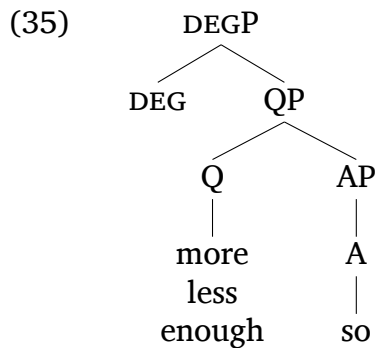
- (33) a. John is **fond of Mary**. Maybe he is [**too much so**].  
 b. John is **fond of Mary**. Maybe he is [**as much so** as Bill].  
 c. The weather was **hot** in Cairo - [**so much so**, that we stayed indoors all day].  
 d. John told me he was **afraid of spiders**, but I wonder [**how much so**] he really is.  
 e. John is **wild about Madonna**, but I am not really [**that much so**].

These facts strongly confirm Bresnan's proposal that gradable adjectives have an underlying quantifier *much* in their structure. Corver's account

of the facts in (33) is shown in (34), where *so* replaces the AP only, *much* appears in Q, and *too*, *as*, *so* and *how* occupy DEG.

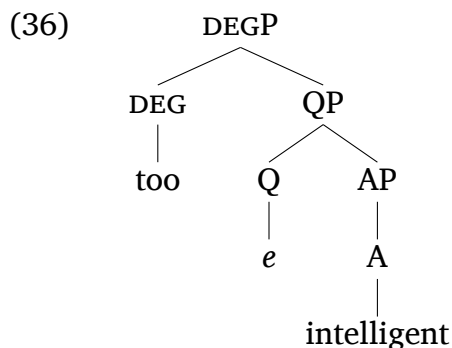


Corver's proposal captures the fact that those degree words that sit in Q, i.e. *more*, *less* and *enough*, as depicted in (35), are in complementary distribution with *much*, while the presence of a degree-like element like *too*, *as*, *so* and *how* presumes the presence of an overtly filled Q as well (cf. the data in (32)).



In sum, on the basis of *so*-pronominalisation facts Corver rehabilitates Bresnan's 'split degree hypothesis' and argues for two projections, DEG and Q, within the extended functional structure of the AP.

The absence of *much* in the presence of the adjective is explained as a consequence of economy principles under Corver's proposal. The structure for a string like *too intelligent* is as in (36), with *e* a lexically empty position.



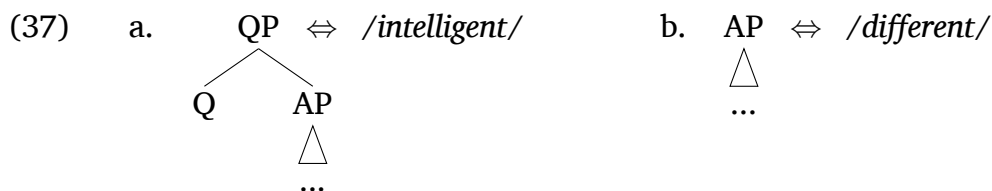
As such, unlike Bresnan, Corver does not argue for the presence of *much* at an underlying syntactic level, but he does argue that Q needs to be lexically supported at some point in the derivation for the derivation to converge at LF. Q can be lexically supported either (i) by being overtly filled (as in (35)), or (ii) by head-movement of the adjectival predicate from A to Q (36), or (iii) by insertion of dummy *much* as a last resort (34).

For a string like *too intelligent*, head-movement, which is a universal rule and therefore less costly, will apply, as opposed to *much*-support, which is a language-specific property, just like *do*-support is in the verbal domain. The trigger for movement of the adjectival predicate has to do with the predicate's internal structure, i.e. its  $\theta$ -grid. In line with Higginbotham (1985), Corver argues that gradable adjectives like *tall* have two argument positions, a theme argument and a referential argument. The reference of the adjective can only be restricted if the open variable, G(grade), is bound by a functional head in a local configuration, triggering movement of the adjective to Q. However, if no lexical adjective is available but a pro-form *so*, as is the case in (33), the trigger for movement, i.e. the theta grid and its concomitant need for thematic discharge, is absent. This will result in activation of the last resort principle of *much*-insertion, since the Q head needs to be filled.

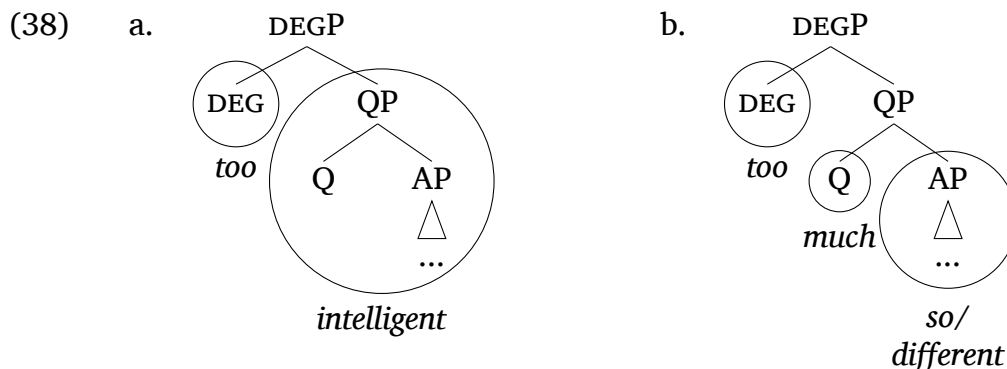
To conclude this section, we want to briefly sketch a way in which the phenomenon of *Much Deletion* can elegantly be dealt with in the system of Nanosyntax, which assumes that lexicalisation does not happen under terminal nodes, but is a property of phrasal nodes. In such a system, a common adjectival root like *intelligent* can be taken to lexicalise the (Corver style) QP node, as shown in (37a). In contrast, adjectives that do not require *Much Deletion* (like *different*, *alike*) have a different lexical entry,



where they can only lexicalise AP, as shown in (37b).<sup>5</sup>



Jackendoff's objection against *Much Deletion* and its optionality is now straightforwardly dealt with. A (syntactic) QP can be lexicalised by an adjective like *intelligent*, as shown in (38a), whereas it cannot be by an adjective like *different*, whose lexical specification is too small to lexicalise QP. Such adjectives will therefore only be able to lexicalise the Q-head by means of *much*. The phenomenon of *much*-support illustrated in (33) above can be dealt with in the same way, if *so* is taken to lexicalise AP. Since it is the same type of lexicalisation as for an adjective like *different*, *so* can also co-occur with *much*. This is shown in (38b).

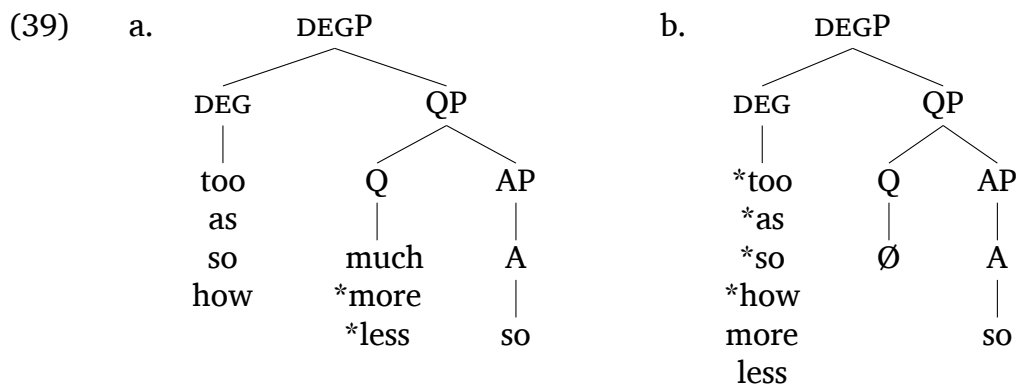


In both cases, the feature Q is without lexicalisation, and *much* appears in order to support it.

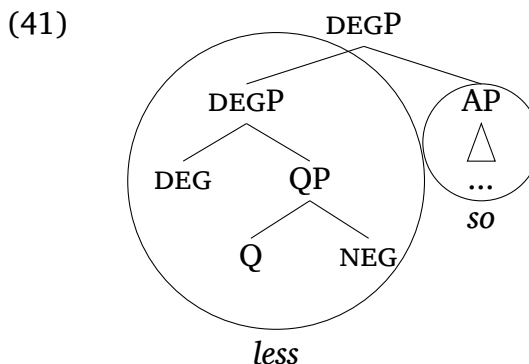
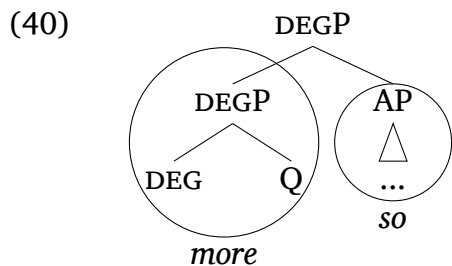
A further advantage of a nanosyntactic analysis is that it provides a natural position for the adjectival modifiers *more* and *less*, which already featured in Bresnan's analysis above. In Corver's analysis, we arrive at the conclusion that these elements cannot be in Q nor in DEG. If they were in Q, we would expect them to alternate with *much*, which they do not (as

<sup>5</sup>The triangle below the AP in these representations indicates further internal structure, of which we provide more detail in section 5.

shown in (39a)). If they were in DEG, we expect them, incorrectly again, to be unable to occur with *so* with Q empty. This is shown in (39b).



These distributional facts can directly be accounted for by assuming, in the spirit of Bresnan’s analysis, that *more* and *less* are portmanteaus for a set of features, as follows:



The fact that *more* and *less* lexicalise both DEG and Q explains why they are incompatible with other DEG elements (see (39a)), and why they can occur with *so* in the absence of other DEG elements, as shown in (39b).

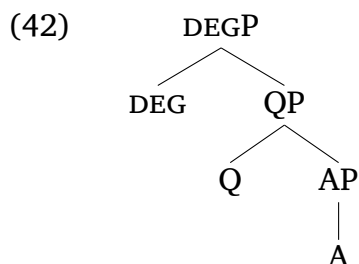
In what follows, we will focus on the DEG projection that sits above QP in (29), and specifically on the position of the comparative and the superlative in the degree system. Somewhat surprisingly perhaps, neither Bresnan nor Corver discuss the superlative at all. Corver is also noncommittal on the position of the marker of the morphological comparative, which he situates in a functional head F above AP (Corver 1997: 124), which makes abstraction of his split degree system. Bresnan does put the

comparative marker in DET (Cover’s DEG), as shown in (21) above. The following section discusses how the DEG head can be further decomposed into a CMPR and SPRL head to deal with certain important generalisations about the comparative and the superlative.

### 3 Splitting DEG

#### 3.1 Evidence from root suppletion and \*ABA

The structure (29), repeated below, has a single DEG head above Q.



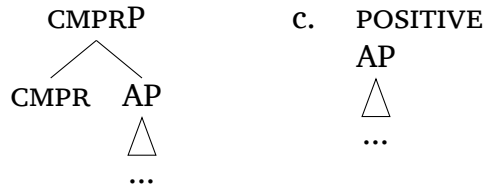
Recall, however, that there is a relatively large number of different degrees (see (2) and (8) above). It is not *a priori* clear whether all the different degrees are fully symmetric and occupy the same DEG head, or whether they exhibit some asymmetries that would justify postulating a richer and a more articulate morphosyntactic representation.

A seminal work in this area is Bobaljik’s (2012) treatment of root suppletion in the positive, comparative and superlative. The main observation is that across various languages, we do not find all logically possible patterns of root suppletion, but only a subset of them. In order to provide a quick overview of the facts, let us turn to Table 1.

The table lists all the logically possible patterns of root distribution. These patterns are defined by sequences of letters, which serve as variables over root shapes. For example, the AAA pattern on the first row represents a case where all the forms have the same root. The ABB pattern represents a situation where we have one root for the positive, and a different root for the comparative and superlative.

The main finding of Bobaljik’s work is that two of the five logically possible patterns are absent. These are the ABA patterns and the AAB





To see how the \*ABA generalization follows from the proposal in (45), let us actually try to encode an ABA pattern using these structures. We shall see that this turns out to be impossible. This then means that the \*ABA generalization is derived, because it is impossible to encode a pattern that violates it.

Suppose that we have one shape of the root in the positive (A) and a different one in the comparative (B). Using contextual specifications for root allomorphs, this can be captured by the rules in (46). The idea is that when AP is on its own (as it is in the positive, see (45c)), it is realized by a context free rule as /ey/. When the same AP is placed under the CMPR head, it is realized as /bee/. So the rules in (46) generate an AB pattern.

- (46) a. AP  $\Leftrightarrow$  /ey/  
 b. AP in the context of CMPR  $\Leftrightarrow$  /bee/

At this point, the question becomes what is going to happen in the superlative. Is it possible that we get /ey/ again? The answer is no. Due to the proposal in (45), the superlative contains the CMPR head just like the comparative does. And since this head leads to the application of the /bee/ rule, the Vocabulary Items in (46) generate the ABB pattern and not the ABA pattern. The conclusion is that if the structures are as in (45), and if allomorphy works as depicted in (46), the ABA pattern cannot be encoded. Hence, the \*ABA generalisation is derived.

Suppose, however, that the degrees were symmetric, as in (47).

- (47) Symmetric structures  
 a. [[ A ] DEG:CMPR ]  
 b. [[ A ] DEG:SPRL ]

In such case, the set of rules in (46) would generate an ABA pattern. The reason is that the *bee*-triggering CMPR head is absent in the superlative, and therefore the superlative falls back on the ‘default’ shape of the root in (46a). Therefore, the \*ABA generalization provides evidence for the

asymmetric organization of degrees as depicted in (45).

An independent piece of support for the structure (45) comes from patterns of actual morphological containment. As Table 2 (from (Bobaljik 2012: 50)) shows, there are quite a few languages where the superlative degree is formed on top of the positive. This independently supports the structures in (45), where the superlative indeed contains the comparative.

Table 2: Morphological containment relations

		CMPR	SPRL
a.	Persian	X- <b>tær</b>	X- <b>tær-in</b>
b.	Lithuanian	X- <b>iau</b>	X- <b>iau-sia</b>
c.	Cimbrian German	X- <b>ar</b>	X- <b>ar-ste</b>
d.	Batsbi	X- <b>vx</b>	X- <b>vx-č</b>
e.	Latvian	X- <b>âk</b>	<b>vis</b> -X- <b>âk</b>
f.	Czech	X- <b>ší</b>	<b>nej</b> -X- <b>ší</b>
g.	Hungarian	X- <b>bb</b>	<b>leg</b> -X- <b>bb</b>
h.	Chukchi	X- <b>əŋ</b>	<b>ənan</b> -X- <b>əŋ</b>
i.	Cherokee	X- <b>ka/ya/...</b>	<b>w</b> -X- <b>kʌʔi/yʌʔi/...</b>
j.	Ubykh	<b>ç'a</b> -X	<b>a-ç'a</b> -X

### 3.2 Full-form syncretisms

An independent piece of support for containment among the degrees comes from patterns of full-form syncretism. Patterns of full-form syncretism are logically independent from patterns of root syncretism. To see that, consider the triplet *tall* — *tall-er* — *tall-est*. If we focus on roots, this is an AAA pattern (the root is *tall* in all three degrees). If we focus on the full form, it is an ABC pattern (each form is different).

Patterns of full-form syncretism are worth attention, because many current frameworks predict that if the structures of the degrees are indeed as in (45), the full forms should obey a \*ABA restriction. We shall look at the implementation of such expectations in Section 3.3, and we take up the empirical discussion first, showing that this prediction is in fact correct.

Let us briefly illustrate the facts, beginning with an AAA pattern. A potential example of this type is provided from Armenian in (48).



- (49) Persian: ABC (Parvaneh Danesh, p.c.)
- a. Reza                    **bolænd**                    = e  
    Reza                    tall    is  
    ‘Reza is tall.’
  - b. Reza *æz Javad* **bolænd -tær**                    = e  
    Reza from Javad tall                    CMPR                    is  
    ‘Reza is taller than Javad.’
  - c. Reza *æz hæme* **boland -tær -in**                    = e  
    Reza from all                    tall                    CMPR SPRL is  
    ‘Reza is the tallest of all.’

Regarding the expression of the standard of comparison, the syntax of these sentences is similar to the Armenian (48). However, an important difference is that the Persian adjective has a comparative-degree marker *-tær* in the comparative, and a complex marker *-tær-in* in the superlative. Persian is therefore an ABC language.

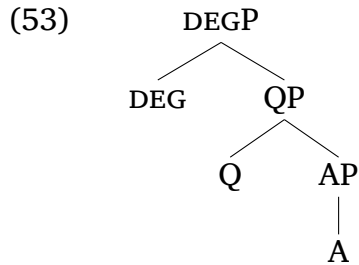
The ABB pattern is found in Gulf Arabic, see (50).

- (50) Gulf Arabic: ABB (Bobaljik 2012: 54, Holes [1995] 2004: 228)
- a. il-banaat **shaaTraat**  
    the-girls clever.F.PL  
    ‘The girl is clever.’
  - b. il-banaat **?ashTar**                    bi kathiir *min al-awlaad*.  
    the-girls clever.CMPR by much                    than the-boys  
    ‘The girls are much cleverer than the boys.’
  - c. haadha huwa (l-walad) il-**ashTar**                    *fi S-Saff*.  
    this                    he                    the-boy the-clever.CMPR in the-class  
    ‘This is the cleverest (boy) in the class.’

The same pattern as in (50) is also found in French, Romanian, Greek, Maltese, Livonian, Irish, Manx and other languages discussed by (Bobaljik 2012: 53-55). In these languages, it is generally possible to distinguish the comparative and the superlative due to the syntactic context, notably due to the presence of the definite article in the superlative, see (50c). However, the definite article is often found with superlatives also in languages that have a dedicated superlative form (Matushansky 2008), which suggests that the presence or absence of the definite article is independent of the superlative marker.



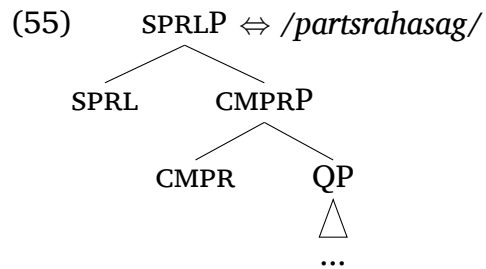
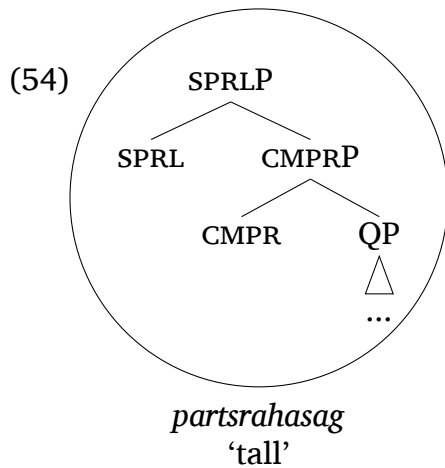




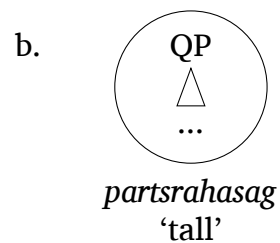
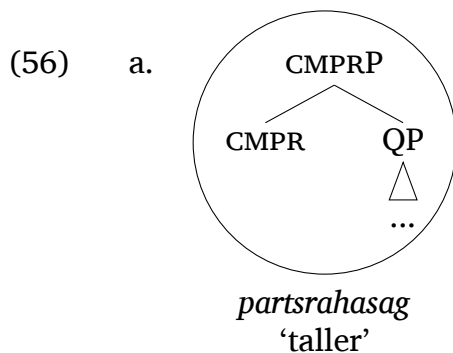
It is an open question for future research as to whether and how the non-classical degrees like excessives, augmentatives and others in (8) can be fitted into the structure (52).

### 3.3 A nanosyntactic implementation

Let us close this section by showing how patterns of full-form distributions have been treated in one of the current morphology frameworks, namely Nanosyntax (Caha 2017b, De Clercq & Vanden Wyngaerd 2018, 2019, Caha et al. 2019a, Vanden Wyngaerd et al. 2020), which we briefly touched upon in section 2 in our discussion of *Much*-support. In Nanosyntax it is proposed that when a form is to realize a particular feature set (e.g., the superlative), then this form must realise all the features of that form. We depict this in (54), where the Armenian form *partsrahasag* ‘tallest’ realises all the features of the superlative. The circle indicates successful lexicalisation of the syntactic structure. Such lexicalisation can happen because the Armenian lexicon contains the lexical item in (55), which links the superlative structure (as per the proposal in (45)) to the pronunciation *partsrahasag*.



Nanosyntax further assumes that when a particular form can pronounce a constituent of a given size, it can actually pronounce any constituent contained inside it. The consequence is that the lexical item *partsrahasag* can spell out also the comparative and the positive, since both are contained inside the lexical entry for *partsrahasag*. We show the spellout of the comparative and superlative in (56).



The fact that a lexically stored tree, as in (55), matches any syntactic tree that it contains, as depicted in (56), is often referred to as the Superset Principle, and defined as in (57) in the theoretical literature.

- (57) *The Superset Principle* (Starke 2009)  
 A lexically stored tree L matches a syntactic node S iff L contains the syntactic tree dominated by S as a subtree.

Arguably, (57) does not have to be stated as such, but is a side-effect of the following assumption:

(58) L can lexicalise S if L = S

where L is any constituent inside the lexicon, and S is built by syntax. In the case of the superlative, (58) applies straightforwardly, since S = L (compare (54) and (55)). But it also works for the Armenian comparative and positive degrees. For example, in a case like (56a), S = CMPRP, and since CMPRP exists in the Armenian lexicon in the entry for *partsrahasag* as given in (55), CMPRP can be lexicalised by *partsrahasag*. The same is true for the QP in (56b). When this approach to the lexicon is combined with the nesting structures proposed by Bobaljik, it provides a straightforward account of syncretism at the level of full forms, i.e. the AAA pattern described above.

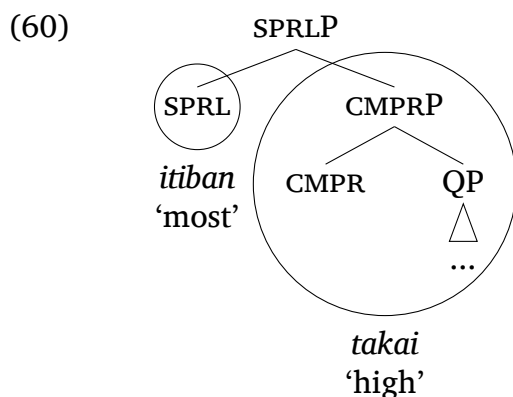
The type of marking that we find in individual languages is then dependent on lexical entries that are found in the language. For example, in the language of the Japanese type (AAB), the adjective *takai* ‘high’ is going to be lexically stored as CMPRP, see (59).

(59)

```

    graph TD
      A["CMPRP ⇔ /takai/"] --- B["CMPR"]
      A --- C["QP"]
      C --- D["△"]
      D --- E["..."]
  
```

This lexical entry will allow it to realise the comparative and the positive in the same way as in Armenian, since both of the structures depicted in (56) are also contained in the structure for *takai* ‘high’ in (59). However, the lexical entry cannot spell out the whole superlative, since the superlative structure is not contained in the entry (59). What happens in such case is that the SPRL feature has to be spelled out by some other lexical item, as shown in (60).



At this point, an aside on the suppletive cases is in order here. A classical question in late insertion models is how to regulate the distribution of suppletive roots and their nonsuppletive counterparts (see e.g. Marantz 1996, Haugen & Siddiqi 2013, Harley 2014). The way this issue is dealt with in nanosyntax is by using the so-called pointer. Pointer makes a reference within a lexical entry to another lexical entry. Concretely, a suppletive root like *worse* is analysed as containing in its lexical entry a pointer to its nonsuppletive counterpart *bad*, as shown in (61). The pointer thus literally encodes ‘lexical relatedness:’ according to this analysis, *worse* is the comparative of the lexical entry *bad*.



In a more technical sense, these entries should be understood as follows. The derivations starts off with *bad*, and this will be the root that appears in the positive, i.e. if the derivation does not extend beyond QP. In the comparative, the feature CMPR is merged on top of QP, and now the resulting structure can be spelled out by (61b). This lexical entry says that it lexicalises a structure that includes the head CMPR as one of its daughters, and where the other daughter corresponds to a structure that has been spelled out by the lexical item *bad* at the previous cycle. The comparative will therefore be lexicalised as *worse*. The way we conceive of the relation between suppletive roots and their nonsuppletive counterparts will again become relevant in Section 4.

To summarize: in this section, we have reported on the research by

Bobaljik (2012), who investigated root suppletion in comparatives and superlatives. He observes that when the comparative has a suppletive root with respect to the positive, then the superlative cannot fall back on the same root as found in the positive. Bobaljik accounts for this in terms of nesting structures given in (45). These structures gain further support from morphological containment patterns. Going beyond Bobaljik’s proposal, we have suggested that syncretism patterns among full forms also respect the \*ABA constraint, providing independent support for the containment relation among the degrees.

## 4 Splitting CMPR and SPRL

In the previous section we discussed how the absence of \*ABA in root suppletion patterns provided Bobaljik (2012) with a reason to decompose DEG into CMPR and SPRL. We also discussed how phrasal lexicalisation as used in Nanosyntax captures the suppletive patterns and naturally extends to full-form syncretism. In this section we will show how a detailed analysis of Czech and Latin morphology, again combined with facts from suppletion, provide support for a further decomposition of both CMPR and SPRL. We will first discuss evidence from Czech for the decomposition of the comparative, to then move on to Latin, which provides support for a similar decomposition of the superlative.

### 4.1 Comparatives in Czech

Czech is a clear example of a language that shows the containment of the comparative by the superlative, and hence provides support for Bobaljik’s proposal discussed in section 3. The relevant data are given in (62). We can see that the superlative is identical to the comparative plus the prefix *nej-*.

(62)	POS	CMPR	SPRL	
	červen-ý	červen-ějš-í	nej-červen-ějš-í	‘red’
	hloup-ý	hloup-ějš-í	nej-hloup-ějš-í	‘stupid’
	moudr-ý	moudř-ejš-í	nej-moudř-ejš-í	‘wise’

Let us now turn to the marking of the comparative. The final vowel in

each of these forms is an agreement marker, which we shall henceforth ignore. Once the final vowel is ignored, we can identify the comparative morpheme as *-ějš-*. This morpheme is productive, used also for newly coined adjectives, like for instance the adjective *benigní* ‘benign’ in (63).

- (63)      *benign-í*      ‘benign’  
             *benign-ějš-í* ‘more benign’

However, as described in traditional grammars (Dokulil et al. 1986, Karlík et al. 1995, Osolobě 2016), there are more ways to form the comparative. The table in (64) (from Caha et al. 2019a: 4) exemplifies a class of adjectives that form the comparative by means of *š*.<sup>13</sup> This type of formation is found with a sizable (but restricted) set of roots; Křivan (2012: 24) says that in his sample of gradable adjectives, there is about 1,3% of cases like this (72/5440).

(64)

POS	CMPR	gloss
<i>bohat-ý</i>	<i>bohat-š-í</i>	‘rich’
<i>star-ý</i>	<i>star-š-í</i>	‘old’
<i>slab-ý</i>	<i>slab-š-í</i>	‘weak’
<i>drah-ý</i>	<i>draž-š-í</i>	‘expensive’
<i>tich-ý</i>	<i>tiš-š-í</i>	‘silent’

The two morphological realisations of the Czech comparative, *-ějš* and *-š*, are obviously related in that the latter seems to be a subpart of the former. This suggests that CMPR *-ějš* consists of two pieces, namely *-ěj* and *-š*.

Further support for such a decomposition comes from comparative adverbs, which lack the *-š*, but have *-ěj*, as shown in (65) (Caha 2017a: 201).

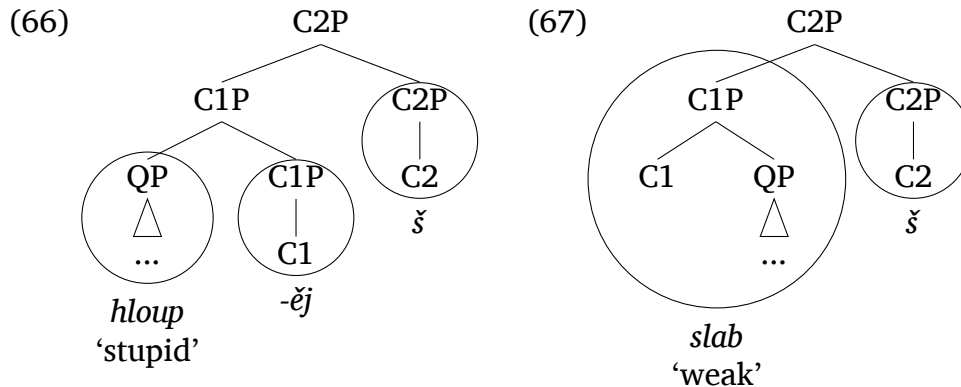
(65)

CMPR ADJ	CMPR ADV	
<i>rychl-ěj-š-í</i>	<i>rychl-ěj-</i>	<i>i</i> ‘faster’
<i>červen-ěj-š-í</i>	<i>červen-ěj-</i>	<i>i</i> ‘redder’
<i>hloup-ěj-š-í</i>	<i>hloup-ěj-</i>	<i>i</i> ‘sillier’
<i>bujař-ěj-š-í</i>	<i>bujař-ěj-</i>	<i>i</i> ‘merrier’

On the basis of these facts, Caha (2017b), De Clercq & Vanden Wyngaerd (2017), Caha et al. (2019a) have argued that just like morphologically

<sup>13</sup>Root-final velar consonants palatalise; we take this to be a purely phonological phenomenon, which does not affect the morphosyntactic representation of these roots.

complex superlatives in (62) provide support for a split DEG approach, morphologically complex comparatives suggest that the functional head CM<sub>PR</sub> is to be split in two functional heads. These are called C1 and C2 for the lack of a better term, with C1 corresponding to the suffix *-ěj*, and C2 to *-š*. We show this in (66).



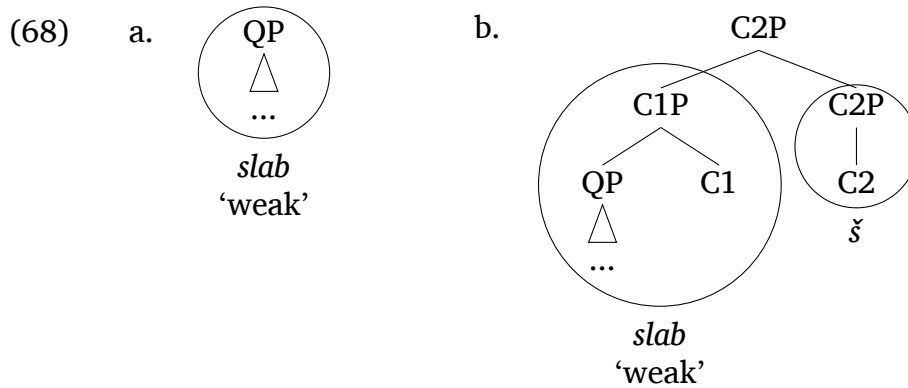
The structure (66) maintains the specifics of the original proposal put forth in Caha et al. (2019a). In their approach, the surface order (with C1 and C2 to the right) is considered to be a derived order. It arises by moving the QP first to the left of C1, specifically to its Spec. As a result, the lower C1P contains just a single daughter node. C1P then moves in a similar fashion to the left of C2. For our purpose, the important point is that the structure provides two positions (C1 and C2) that can accommodate *-ěj* and *-š* respectively. This is indicated by the circles.<sup>14</sup>

Let us now turn to the adjectives that only have *-š* in the comparative. This pattern is captured by proposing that the relevant roots (which form a restricted set) are lexically associated to a constituent of the size C1P. This allows them to lexicalize the C1P constituent in (67), thereby eliminating the need for *-ěj*.

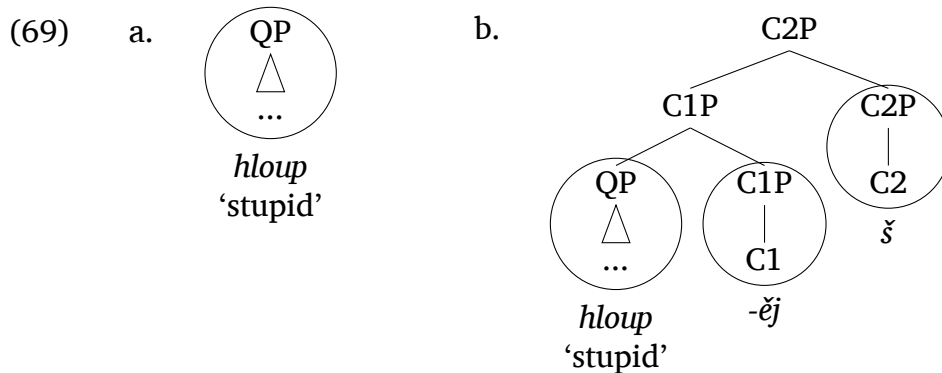
Note that due to the Superset Principle, such roots can also spell out any sub-constituent of C1P, and they can therefore also spell out the QP. Since QP in this approach corresponds to the positive, the positive-comparative pair in this class looks as in (68).

<sup>14</sup>In Caha et al. (2019a), the movement of the root is triggered by a specific spellout algorithm, which we do not discuss here for reasons of space. For more details concerning the spellout algorithm, we refer the reader to Starke (2018), Caha et al. (2019b), Vanden Wyngaerd et al. (2020).





As the trees (68a,b) make clear, adjectives of this class spell out different constituents in the positive (QP) and in the comparative (C1P). This is different from the productive class, shown in (69), where adjectives lexicalize the same constituent (namely QP) both in the positive and in the comparative.



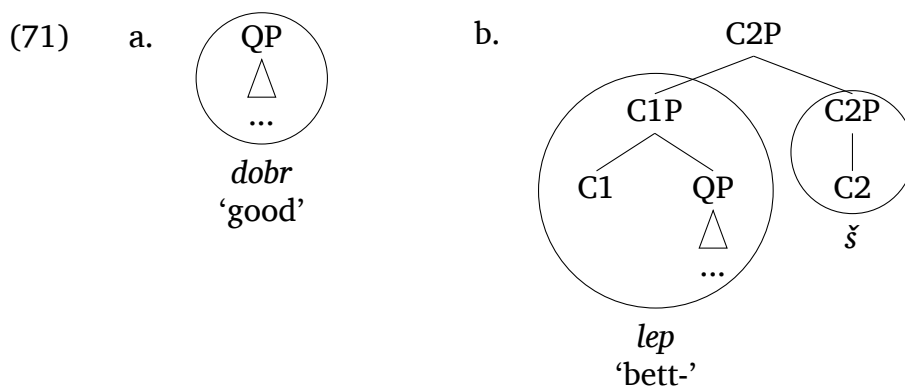
Caha et al. (2019a) argue that this type of analysis – with a decomposed comparative and phrasal lexicalisation – leads to two correct predictions in Czech.

The first prediction concerns root suppletion. It arises when the structures in (68) and (69) are combined with the assumption that suppletive roots always spell out constituents of different size, as required by the pointer analysis presented in Section 3. If this is so, then only the *-š* class of comparatives can give rise to suppletion. Adjectives with *-ejš* cannot show suppletion, because they lexicalise the same constituent in the positive and in the comparative. As Caha et al. (2019a) argue, this prediction

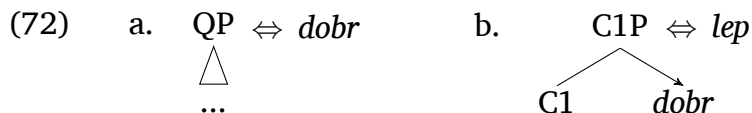
is borne out. The list of Czech suppletive adjectives is shown in (70) (from Caha 2017a: 201-204). We can see that all such adjectives are formed by -š.

(70)	POS	CMPR	SPRL	
	dobr-ý	lep-š-í	nej-lep-š-í	‘good’
	špatn-ý	hor-š-í	nej-hor-š-í	‘bad’
	mal-ý	men-š-í	nej-men-š-í	‘little, small’
	velk-ý	vět-š-í	nej-vět-š-í	‘big’

The analysis of these suppletive pairs in Caha et al. (2019a) proposes that the suppletive roots in (70) give rise to the same structures as all the other comparatives with -š. We show this in (71). The important point is that each root spells out a constituent of a different size.



We give the lexical entries for the pair *dobr-/lep-* ‘good’ in (72). The entry for *lep-* ‘bett’ contains a pointer to *dobr-* ‘good,’ recall the discussion surrounding (61b).



In sum, the analysis with two comparative heads explains not only the original fact (namely that Czech comparatives may be morphologically complex), it also yields a correct prediction about suppletion. The prediction arises from the idea that suppletion requires that each root lexicalises a slightly different structure. Such a difference only exists in the -š class,

and hence, only the *-š* class shows suppletion. In the *-ěj-š* class, suppletion is predicted to be impossible.

The second prediction is that there could exist roots in Czech that have no comparative marker whatsoever and use the bare root in the comparative. Such roots would spell out the full comparative structure, i.e., C2P. We have already proposed such entries for the English *worse* and for Japanese comparatives in general (recall (59) and (61b)).

Examples like that exist in the dialect of North-East Bohemia (Bachmannová 2007), and they are given in the table below, along with the standard forms.

(73)	St. Czech	N-E Bohemia	gloss
POS	CMPR	CMPR	
ostr-ý	ostř-ejš-í	ostř-ø-í	‘sharp’
mokr-ý	mokř-ejš-í	mokř-ø-í	‘wet’

The difference between the two sets of forms is not a matter of a difference in the application of phonological processes, but a consequence of the roots belonging to different morphological classes. The standard form takes the *-ějš* allomorph, but the dialectal forms have no overt marker; we only see the agreement marker after the root.<sup>15</sup>

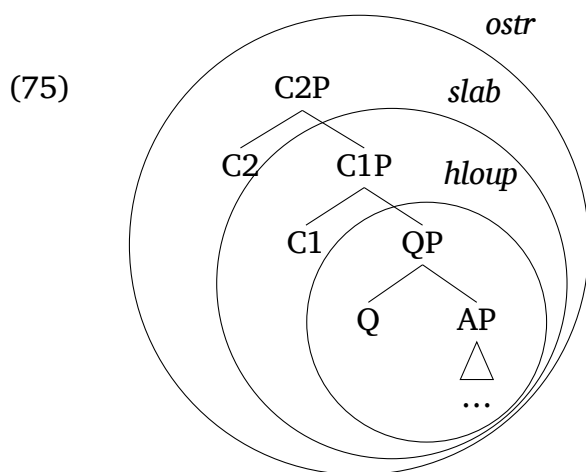
In sum, when we take the dialectal forms into consideration, there are three attested patterns in Czech, as summarized in (74a-c) ( $\alpha$  represents an overt suffix, while  $\emptyset$  represents an apparent zero). The point that Caha et al. (2019a) make is that the existence of precisely these three classes is predicted under the assumption that the comparative has two components (C1 and C2), and that the root spells out different sizes of structure, namely QP, C1P and C2P, producing the classes (74a-c) respectively.

(74)		root	C1	C2	
a.	ATTESTED:	<i>Type 1</i>	$-\alpha$	$-\beta$	( <i>hloup-ěj-š-í</i> )
b.	ATTESTED:	<i>Type 2</i>	$-\emptyset$	$-\beta$	( <i>slab-ø-š-í</i> )
c.	ATTESTED:	<i>Type 3</i>	$-\emptyset$	$-\emptyset$	( <i>ostř-ø-ø-í</i> )
d.	NOT ATTESTED:	<i>Type 4</i>	$-\alpha$	$-\emptyset$	

<sup>15</sup>The positive and the comparative are not identical, since they differ in the quality of the final consonant. This may be treated as suppletion, or as a regular phonological effect of the agreement marker in the comparative on the root. We leave this open here.

Importantly, the pattern (75d) does not occur and this is also expected. The crucial difference between the attested patterns in (74a-c) and unattested pattern (74d) is that only with the unattested pattern, the root is followed by an overt marker, which is followed by a zero suffix. If zero markers arise as a result of phrasal spell out by the root, this pattern is ruled out, since the root cannot spell out C2 without simultaneously spelling out C1.

Thanks to the system of phrasal spellout introduced in sections 2 and 3, these patterns can be nicely explained in terms of different root sizes for different lexical roots. The structure in (75) presents the different sizes of Czech adjectival roots in an arboreal configuration.



## 4.2 Latin superlatives

A similar argument for decomposition of the superlative in two distinct pieces, and therefore two separate heads, can be made on the basis of evidence from Latin (see De Clercq & Vanden Wyngaerd 2017). Table 3 provides an overview of relevant data that we shall discuss.

The regular marking of comparative and superlative is shown in line (a) of Table 3. In the table, we segment the regular superlative marking into five morphemes (following De Clercq & Vanden Wyngaerd 2017). The first morpheme is the root (*alt*), and the last one (*-us*) is agreement (NOM.M.SG). The reason for treating the three middle markers *-i*, *-ss* and *-im* as separate morphemes is that they can be missing in the irregular forms shown in lines (b-f) of Table 3. These represent an exhaustive list

Table 3: Latin degree morphology

	POS	CMPR	SPRL	gloss	marking in SPRL
a.	alt-us	alt-i-or	alt- <b>i-ss-im</b> -us	‘tall’	full marking
b.	mal-us	pe-i-or	pe- <b>ss-im</b> -us	‘bad’	SPRL lacks <i>-i</i>
c.	bon-us	mel-i-or	opt- <b>im</b> -us	‘good’	SPRL lacks <i>-i-ss</i>
d.	magn-us	ma-i-or	maks- <b>im</b> -us	‘big’	SPRL lacks <i>-i-ss</i>
e.	parv-us	min- or	min- <b>im</b> -us	‘small’	SPRL lacks <i>-i-ss</i>
f.	mult-us	plūs	plūr- <b>im</b> -us	‘much’	SPRL lacks <i>-i-ss</i>

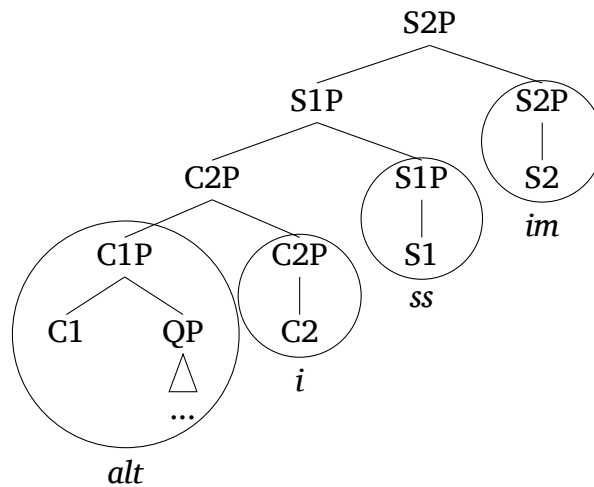
of the suppletive cases given by Gildersleeve & Lodge (1903: 46).

De Clercq & Vanden Wyngaerd (2017) analyse *-i* (the first of the post-root morphemes in *alt-i-ss-im-us*) as a comparative marker, i.e., as a morpheme identical to the *-i* of the comparative *alt-i-or*. They treat this *-i* in the same way as Czech *-š*, namely as the lexicalisation of C2. Consequently, *-or*, which follows *-i* in the comparative, is analyzed as an agreement marker. This is so because the masculine form *alt-i-or* ‘taller, M.SG’ alternates with the neuter *alt-i-us*. In sum, ignoring agreement, the superlative *alt-i-ss-im-* is based on the comparative *alt-i-*.

As a C2 marker, *-i* is compatible with suppletion. In line (c), for instance, the positive degree root *bon-* realises QP, the suppletive comparative root *mel-* realises C1P, and *-i-* is the marker of C2.

The remaining two morphemes mark the superlative, which is then split into S1 and S2, analogously to CMPR. The structure of *alt-i-ss-im(-us)*, after the application of several cycles of roll-up movement, thus looks as follows:

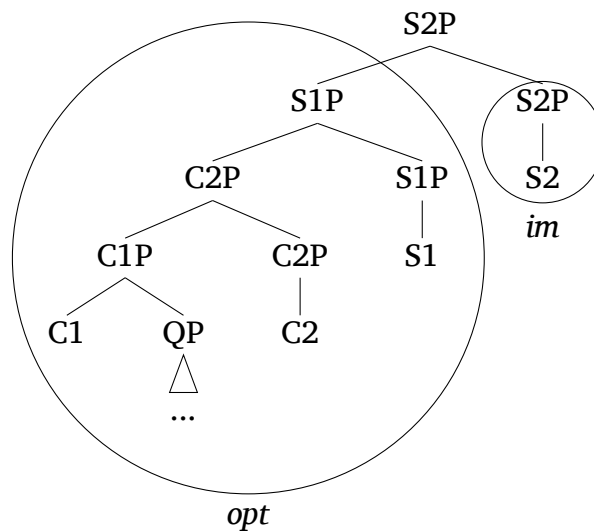
(76)



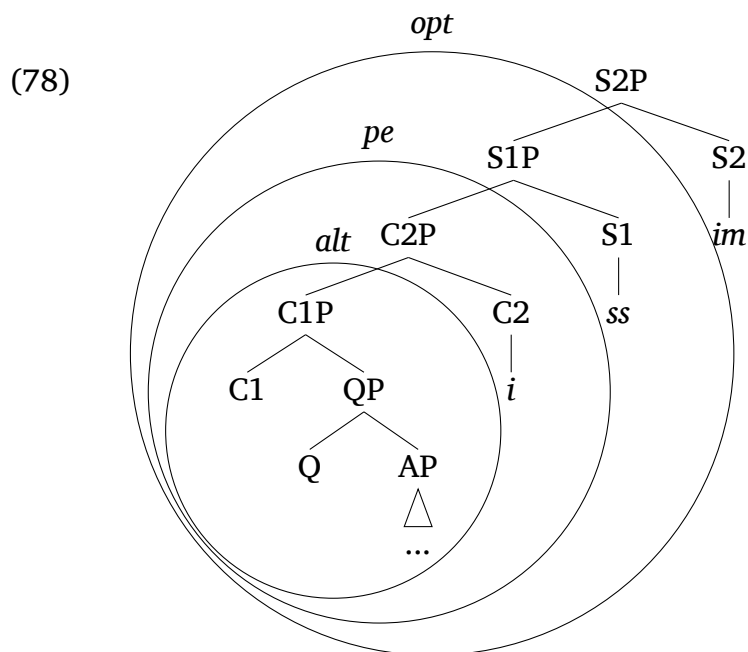
Against this background, consider the fact that the superlative marking with suppletive roots is always reduced (see Table 3, lines b-f). There is not a single suppletive root in Latin which keeps all the three pieces in place, as indicated in the final column of the table.

Specifically, we see two classes of suppletive roots. The majority of suppletive roots (c-f) lack the C2 *-i* as well as the S1 *-ss*, and we would thus analyse them as spelling out S1P. For example, a suppletive root like *opt* (in the superlative *opt-im-us* ‘best’) lexicalises S1P, thus eating up, as it were, part of the regular superlative marking, so that we only get *-im* instead of the regular *-i-ss-im*. This is shown in the tree in (77).

(77)



The second class is constituted by *pe-*, which only lacks the initial *-i* of the regular *-i-ss-im*. On the assumption that *-i* is C2, this leads to the analysis in (78).



Summarising, we can say that the interaction of regular comparative and superlative morphology with suppletive roots allowed for a decomposition of CMPR and SPRL into two heads each. This decomposition approach not only allow an account of the reduced morphological endings in the presence of suppletion, but it also explains suppletion as a consequence of a lexically stored portmanteau that does not only spell out the bare adjectival root, but also a part of the degree structure. Thanks to fine-grained empirical work on Czech and Latin, we showed that Corver’s DEG and Bobaljik’s CMPR and SPRL heads can be decomposed into several smaller units. In what follows, we will show that the deeper we dig into the morphological marking of degree, the more functional heads we will be able to unearth.

## 5 The positive degree

## 5.1 Two issues

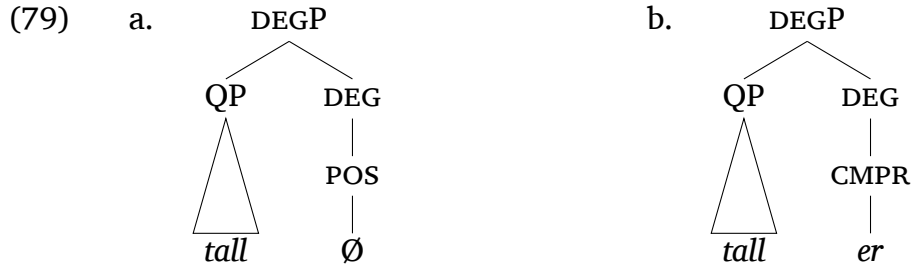
As amply exemplified in the previous sections, the expression of adjectival degrees is often rich and complex, suggesting a fine-grained morphosyntactic structure with several functional projections. However, one degree that has been so far suspiciously absent from the discussion is the positive degree. Two issues stand out with respect to the positive, one morphological and one semantic. The positive is special from a morphological perspective in that overt (let alone complex) marking for the positive degree is rare in the languages of the world. It is special semantically in that its meaning is not contained in that of the comparative.

The lack of morphological marking of the positive is often taken to reflect the fact that the positive corresponds to the basic form of the adjective, the other degrees being constructed by adding functional heads on top of the positive. This idea is quite intuitive, given the frequent morphological containment relation between the positive and the comparative, e.g., *nice–nice-er*. This morphological containment translates rather straightforwardly into a structural containment of the Bobaljik type, as illustrated in (45) above, i.e. the structural containment that characterises the pair comparative-superlative is often taken, without much discussion, to extend to the pair positive-comparative.

However, the proposal that the structure of the comparative contains the structure of the positive creates a tension with the semantics, since the meaning of the comparative does not contain the meaning of the positive in any obvious way. Semantic containment could be viewed as entailment, such that, for instance, the excessive degree (*Misha is **very old***) entails the positive degree (*Misha is **old***). However, the comparative does not entail the positive: *Misha is **older than Yana*** does not entail that *Misha is **old***. The positive does not entail the comparative either. From this perspective, it is dubious that the structure of the comparative contains the structure of the positive.

Therefore, in the semantics literature, a (silent) degree head POS is often assumed in the positive (e.g., Kennedy 2007). This is depicted in (79a). As the reader can easily see, the positive structure (79a) is of equal morphosyntactic complexity as the comparative structure (79b).





We will call this a symmetric structure, to distinguish it from the asymmetric or containment structure in (45) above. Importantly, the proposal (79) does not lead us to expect any entailment between the comparative and the positive, since the comparative structure does not contain the full positive structure; it only contains its proper sub-part of the positive (namely the QP).

In this section, we offer both empirical and theoretical arguments in support of a version of (79a), i.e. one where the positive is not fully contained in the comparative. Concretely, we shall defend the view that the positive is a comparative with a gap in the functional sequence, in a manner to be made more concrete below. To this end, we shall first consider the various morphological patterns of positive-comparative marking, starting out from a proposed candidate universal by Grano (2012), Grano & Davis (2018) (section 5.2). Next, we hone in on one of these patterns attested in Slovak, which is particularly problematic for the structural containment view of the pair positive-comparative. To account for this pattern, we adopt the proposal with the gapped structure developed in Vanden Wyngaerd et al. (2020) (henceforth VW) (section 5.3). We conclude the section by reviewing an inverse containment pattern in Mandarin (section 5.4).

## 5.2 Patterns of morphological marking

Table 4 lists five logically possible morphological relations between the positive and the comparative. The first column describes the type of morphological relation, while the other columns provide an example of each type.

The final column (labelled PCA) refers to a candidate universal proposed in the work of Grano (2012), Grano & Davis (2018), which runs as

Table 4: Patterns of positive-comparative relations

relation	language	POS	CMPR	gloss	PCA
a. containment	Irish	ard	ard- <b>a</b>	‘tall(er)’	✓
b. identity	Japanese	<b>takai</b>	<b>takai</b>	‘tall(er)’	✓
c. inverse containment	Mandarin	<b>hen</b> gao	gao	‘tall(er)’	✗
d. symmetric	Slovak	vys- <b>ok</b> -ý	vyš- <b>š</b> -í	‘tall(er)’	✗
e. suppletive	English	bad	worse		✗

in (80).

(80) *The Positive-Comparative Asymmetry (PCA)*

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

Of the five patterns of Table 4, the PCA only allows the first two, the containment and the identity pattern. The first one is well-known from many Indo-European languages (including English), while the second pattern recalls Armenian (48) and Japanese (51), discussed in section 3. These are the two most frequent types. If the PCA (80) is correct, the languages on lines (c-e) must turn out to be irrelevant for one reason or another (Grano 2012, Grano & Davis 2018 explicitly addresses some of the challenges).

Grano (2012), Grano & Davis (2018) take the PCA to support idea that the structure of the comparative contains the structure of the positive. Grano (2012: 513) further suggests that the absence of morphological marking of the positive holds, because “positive semantics is provided by a type-shifting rule that does not project in syntax.” This allows morpho-syntactic structures to be asymmetric (as per Bobaljik’s containment idea in (45)), and at the same time maintain the idea that the comparative does not contain the semantics of the positive.

However, as an empirical generalisation, the PCA has at least one robust counterexample, which is the symmetric pattern on line (d) of Table 4, and illustrated by Slovak. This pattern, in combination with the semantic observations discussed in section 5.1, will provide sufficient support to propose a noncontainment structural relation between the positive and the comparative. The Slovak data and their implications are the topic of the next section.

### 5.3 Comparatives in Slovak

In Slovak, comparatives are generally formed by attaching *-š* or *-ejš* to a base that corresponds to the positive, see (81).<sup>16</sup>

- (81) a. star *-ý*            star *-š*    *-í*  
          old -AGR        old -CMPR -AGR  
          ‘old, older’
- b. múdr *-y*            múdr *-ejš*    *-í*  
          wise -AGR        wise -CMPR -AGR  
          ‘wise, wiser’

However, a subset of morphologically complex adjectives shows a more interesting pattern of comparative formation. Such adjectives in the positive degree contain an extra morpheme (in addition to the root), called the *augment*. The most relevant observation is that with many such adjectives, the augment is missing in the comparative, see (82). As VW point out, such truncating examples counter-exemplify the Positive-Comparative Asymmetry (80).

- (82) a. hĺb *-ok*    *-ý*  
          deep -AUG -AGR  
          ‘deep’
- b. hĺb *-š*        *-í*  
          deep -CMPR -AGR  
          ‘deeper’

Truncating examples such as (82) co-exist with non-truncating examples like (83), where the augment is preserved, i.e. where the comparative morphologically contains the positive.

- (83) a. div *-ok*    *-ý*  
          wild -AUG -AGR  
          ‘wild’
- b. div *-ok* *-ejš*    *-í*  
          wild -AUG -CMPR -AGR  
          ‘wilder’

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<sup>16</sup>The two allomorphs *-š* and *-ejš* are clearly related to the ones discussed for Czech in section 4, Czech and Slovak being closely related languages. We do not address their distribution here, as this is an issue that is orthogonal to our concerns.

The very same difference between a truncation and a containment pattern in the comparative is replicated by another augment, namely *-k*. In (84), the *k* augment is dropped in the comparative, giving rise to a symmetric pattern: both the positive and the comparative are derived by an affix from a common base (the root *lah* ‘easy’).

- (84) a. *lah -k -ý*  
 easy -AUG -AGR  
 ‘easy’  
 b. *lah -š -í*  
 easy -CMPR -AGR  
 ‘easier’

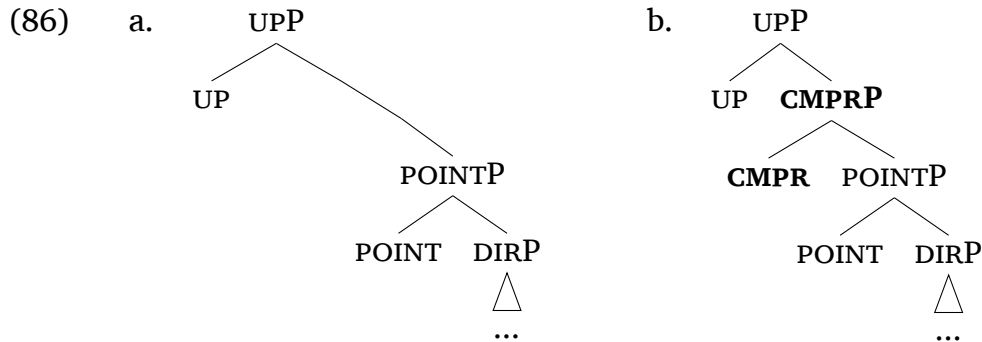
In (85), we show that a similar looking adjective keeps the augment, giving rise to the containment pattern, where the positive form (including the augment) is used as a basis of the comparative.

- (85) a. *kreh -k -ý*  
 fragile -AUG -AGR  
 ‘fragile’  
 b. *kreh -k -ejš -í*  
 fragile -AUG -CMPR -AGR  
 ‘ more fragile’

Two different augments therefore share the following properties: (i) the presence or absence of the augment in the positive is determined by the type of adjectival root, and (ii) also depending on the type of root, the augment may disappear or survive in the comparative.

VW propose that it is possible to capture all these patterns by adopting a gapped structure for the positive in relation to the comparative. This means that the positive is structurally smaller than the comparative (as in Bobaljik’s containment structures, and unlike in (79)), but still not fully contained in the comparative either. Instead, the positive is the comparative minus one functional head in the sequence, but this missing head is not the head that sits at the top of the comparative, but a lower head.

To make this concrete, consider (86), where (86a) gives the structure of the positive, and (86b) corresponds to the comparative. The ‘gap’ in the structure of the positive is the absence of the CMPR head, indicated in bold in the comparative structure (86b), and conspicuously absent in (86a).



In this proposal, gradable adjectives decompose into several layers, resulting in an even more fine-grained structure than the one proposed in section 2. The lower part of these structures (labelled DIRP) corresponds to a scale. Its ingredients are not directly relevant, and the DIRP is therefore simplified to just a triangle. What is important to keep in mind is that the DIRP semantically corresponds to a measure function that maps individuals onto degrees.<sup>17</sup>

As is customary in the semantics literature (recall (79)), we need to apply degree morphology to turn the measure function into a predicate. The heads that are found above DIRP serve this purpose. In the positive, there are two heads, namely POINT and UP. The two heads each perform one of the functions of the positive.

The first function is that positive degree morphology determines a particular STANDARD OF COMPARISON on the scale. This function corresponds to the head POINT in (86), since the STANDARD can be looked upon as a point on the scale. In the case of the positive degree, this point is left unspecified and its specific position is therefore filled depending on the specific context. This corresponds to the context-dependent nature of the positive degree.

The head UP is adopted from the work by Neeleman et al. (2004);

<sup>17</sup>Following much of the literature, VW propose that each scale decomposes into a particular DIMENSION (speed, intelligence, ...) and DIRECTION. The DIRP may also contain an optional NEG head (for negative adjectives). Further note that the two heads CMPR and UP cannot be interpreted the same as corresponding to C1 and C2, respectively, introduced in the previous section. Rather, the CMPR head in (86) must be understood as a shorthand for C1 and C2. The reason is that Slovak has the same two comparative markers *-ejš* and *-š* as Czech. For simplicity, VW treat them as non-decomposable expression of CMPR.

its role is to perform the second function standardly associated to POS, which is to turn the scale into a predicate. The predicate is true for those individuals whose value on the scale is UP from the contextual standard, represented by POINT.

In the comparative (86b), the POINT on the scale (that represents the standard) is not determined by context, but by a *than*-phrase. We take the feature CMPR to be responsible for this: it further operates on POINT, such that POINT + CMPR are responsible for setting the standard in accordance with an (overt or covert) *than*-phrase. After the value of POINT (representing the standard) is set in accordance with the *than*-phrase, the feature UP is added (as in the positive). Once added, this feature turns the measure function into a predicate. Once again, the predicate is true for those individuals whose value on the scale is UP from the standard of comparison, represented now by POINT + CMPR (where CMPR, rather than context, specifies the precise value of the POINT).<sup>18</sup>

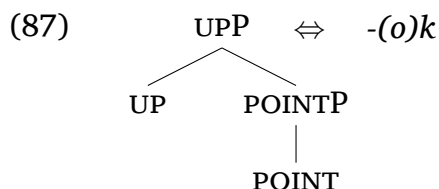
As we observed in Section 1, the positive degree is in fact a covert comparative. This is reflected in the structures in (86), which portray the difference between the positive and the comparative as one that essentially involves the standard of comparison: in the positive degree, the standard is supplied by the context and usually remains implicit, whereas in the comparative, the standard appears in a *than*-phrase, and is usually overt. This is the basic idea which the structures in (86) pursue.

The main interest of the proposal lies in the fact that it suggests a novel type of relationship between the positive and the comparative. Looking at (86), we can see that the positive is not a subconstituent of the comparative. This reflects our earlier observation that there is no entailment relation between the comparative and the positive. Instead, the positive equals the comparative minus the CMPR feature, which occupies a position in the sequence between the highest head UP and the lower head POINT.

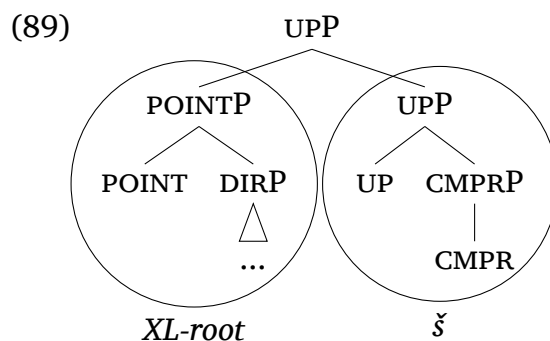
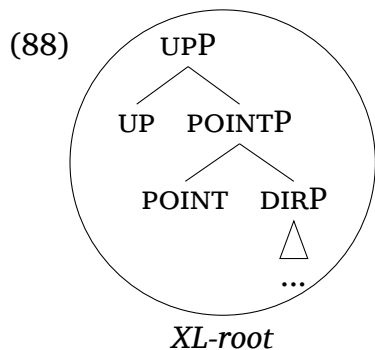
Let us now address the question how these assumptions derive the observed distributional patterns of the Slovak augments. The first assumption is that the augments are the realisation of the features POINT and UP, as in (87).

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<sup>18</sup>See also Kennedy & Levin (2008: 172-3), who propose the same type of structural relation between the positive and the comparative on semantic grounds.



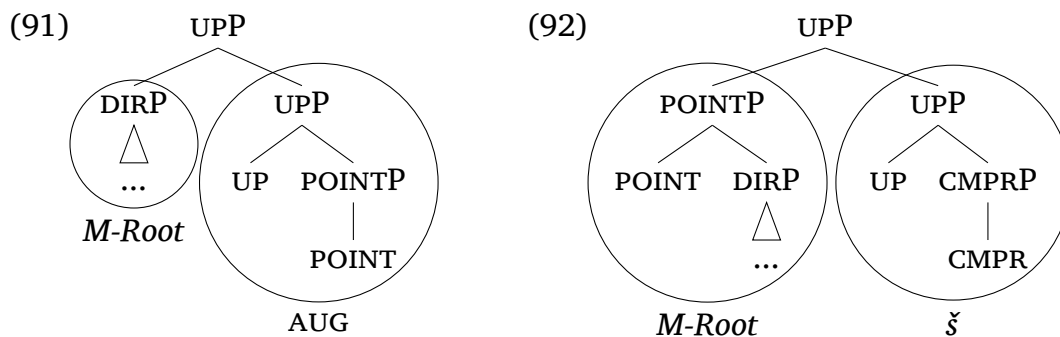
Now recall that some roots do not need an augment at all. These roots are called XL-roots in VW, and they are stored in the lexicon in a way that they can lexicalise both POINT and UP. They need no augment since they can lexicalise the full structure of the positive, as shown in (88). In the comparative, they spell out POINTP (in line with the Superset Principle in (57)), and the comparative marker spells out CMPR and UP (modulo the prior leftward movement of POINTP, a matter that we ignore here).



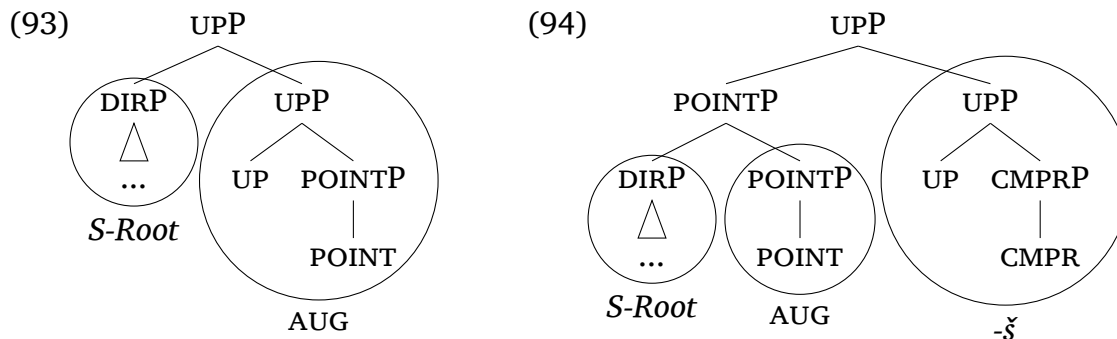
Roots that require the augment are lexically smaller than XL-roots, and fail to spell out some of the features of the positive. Therefore, they need the augment, minimally in the positive. Recall that such roots come in two classes. With some roots, the augment is maintained in the comparative (the containment pattern), whereas with other types of roots, the augment disappears in the comparative (the truncation pattern). VW propose that this bifurcation is again a consequence of root size. The idea is that some roots only fail to spell out the feature UP, while others fail to spell out both POINT and UP. For convenience we call these M-roots and S-roots respectively:

- (90)
- a. XL-roots: spell out all the features of the positive
  - b. M-roots: fail to spell out UP
  - c. S-roots: fail to spell out both UP and POINT

M-roots are of size POINTP: they only fail to spell out UP. Since UP needs to be lexicalised, they require an augment in the positive, as shown in (91).<sup>19</sup> However, in the comparative, the root lexicalises POINTP, and the comparative marker spells out CMPR and UP. Therefore, M-roots need no augment in the comparative, and the truncation pattern is derived. This is shown in (92).



Finally, S-roots lexicalise only DIRP. The augment is therefore needed in the positive (where it spells out both POINT and UP), see (93). Crucially, it is also needed in the comparative, where it spells out POINT, see (94). Neither the comparative marker or the root can spell out POINT.



For a more detailed discussion of the derivations involved, we refer the reader to VW.

In sum, this section has discussed data from Slovak that provide morphological support for the lack of entailment that can be observed between

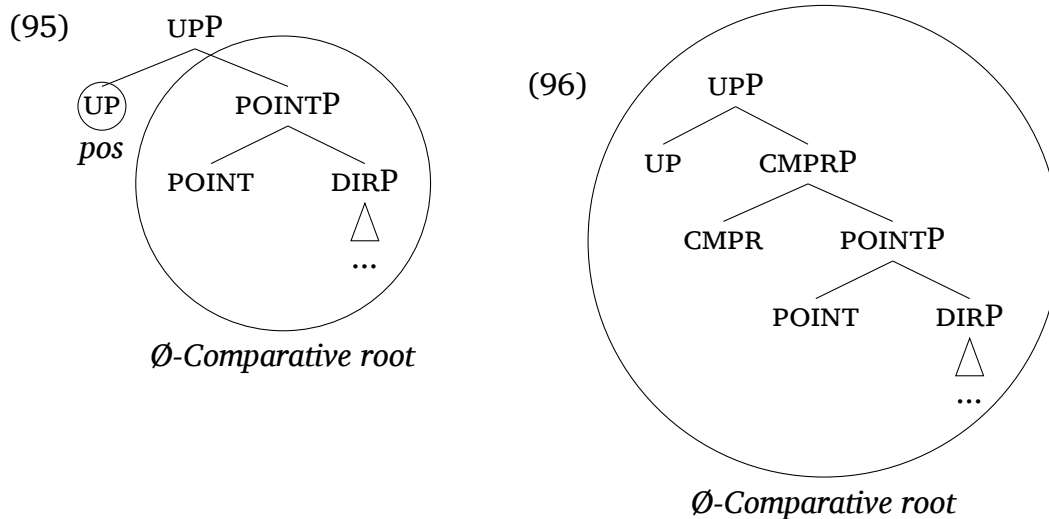
<sup>19</sup>Note that both the root and the augment could in principle lexicalise POINT, since both have the feature in their lexical entry. Since lexicalisation involves constituent matching between syntactic and lexical trees (recall (58) above), in actual fact only the augment will be able to lexicalise POINT, as shown in the tree (91).



the positive and the comparative. The combination of both morphological and semantic support for a non-containment relation between the positive and the comparative led us to adopt symmetric but gapped structures.

## 5.4 Inverse containment in Mandarin

In this final section, we briefly address inverse-containment patterns. In the typology proposed in Table 4, these correspond to cases where the positive would be derived by adding a morpheme to the comparative form. Grano & Davis (2018) correctly point out that this pattern is impossible to derive if the comparative contains the positive at the level of morphosyntax (unless a zero comparative marker is assumed). However, the non-containment structures proposed in VW actually do provide space for producing such patterns. We show this in (95). The idea depicted here is that in such languages, the root is not specialised for the positive degree (i.e. it does not lexicalise all the features of the positive), but rather for the comparative degree, lexicalising all the features of the comparative, see (96). We call this a ‘ $\emptyset$ -Comparative root’, to indicate that it does not need any morphological marking in the comparative.



Such a root cannot, however, lexicalise the full positive structure in (95), since *POINTP* has *UPP* directly above it, and for that reason the *UPP* of (95) is not a subtree of (96). The feature *UP* must be therefore spelled out by an independent ‘positive’ marker. Mandarin Chinese *hen* has been argued

to be an overt positive degree morpheme of this type (e.g., Sybesma 1999, Liu 2010), but see Huang (2006), Grano (2012), Zhang (2015) for some alternative views. We show the relevant data in (97).

- (97) Mandarin (Zhang 2015: 17,21)
- a. Dawei **hen** gao.  
David very tall  
'David is very tall.' (hen is stressed)  
'David is tall.' (hen is not stressed)  
Not: 'David is taller.'
  - b. Dawei **gao**.  
David tall  
'David is taller than others.'  
Not: 'David is tall.'
  - c. Zai quan-jia-ren dangzhong, Dawei **zui** gao.  
at whole-family-person in David most tall  
'Among the whole family, David is the tallest.'

If this pattern is taken at face value, it provides additional morphological evidence for a symmetric (or gapped) structural relation between the positive and comparative: data like this can be easily explained by the proposal in (95) and (96). Importantly, if this proposal is on the right track, the tension between the morphological marking of the positive degree and its meaning may only be apparent.<sup>20</sup>

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<sup>20</sup>The difficulty with Mandarin is that there are various environments where *hen* is missing, yet the bare adjective has the interpretation of the positive degree. One such environment is in the scope of negation (i).

- (i) Zhangsan bu gao.  
Zhangsan not tall  
'Zhangsan is not tall (the possibility of Zhangsan's being short is not excluded).'
- Not: 'Zhangsan is not taller.' (Liu 2010: 1019)

An account based on (95) would have to find ways of either having the negation *bu* pronounce UP, or somehow license its non-pronunciation. Needless to say, we are touching here on questions that are still the subject of ongoing research.

## 5.5 Summary

This section started out by looking at the typology of the morphological marking of the pair positive-comparative, arguing that all the five logically possible patterns of Table 4 are attested. We have looked at two patterns in particular, the symmetric pattern of marking (or truncation pattern) instantiated by Slovak, and the inverse containment pattern of Mandarin. Both of these patterns are problematic (each in their own way) for the standard theory depicted in (45), according to which the comparative contains the structure of the positive.

We have proposed a theory which holds that the positive is structurally smaller than the comparative, but in a gapped kind of way, i.e. the positive equals the comparative minus the feature *CMPR*, which does not sit at the top of the comparative sequence, but in a lower position, between *UP* and *POINT*. The proposed structures capture the semantic fact the positive and the comparative differ only in how the standard of comparison is determined (left vague in the positive, linguistically coded in the comparative). Apart from capturing the full set of morphological relations, these structures therefore also fit well with the semantics.

## 6 Conclusion

In this paper, we started off from the four basic degrees of Ultan (1972), which comprised the positive, the equative, the comparative, and the superlative. We argued that this basic classification can be expanded by looking at semantic distinctions as well. It turned out that for most of these semantic distinctions both morphological and syntactic realisations can be found across languages, suggesting that Ultan's four degrees do not suffice to capture the domain of degree morphology.

Section 2 discussed how Bresnan's (1973) seminal paper on comparative constructions led to the decomposition of the adjective into a lexical core and a partitive layer, labelled *QP* (itself containing both a *DET* and a *Q* head), whose head can be filled by *much*, and which combines with the comparative marker *-er* in its specifier to give rise to the formation of *more*, *less* and *fewer*. We next discussed the 'split degree hypothesis' defended in the work of Corver (1997), which takes there to be a *DEG* and a *Q* head in the functional superstructure of the adjective. We provided

a nanosyntactic analysis of the phenomena of *so*-pronominalisation and *much*-support with adjectives, as discussed by Corver. The analysis we proposed allowed for an elegant treatment of the facts discussed by Bresnan and Corver, while avoiding the pitfalls raised by their accounts.

Section 3 addressed the evidence presented in Bobaljik (2012) to the effect that Corver's DEG head needs to be split up into a comparative (CMPR) and superlative (SPRL) head. The evidence concerned patterns of suppletion in the triplet positive-comparative-superlative, which shows an absence of both AAB and ABA patterns. In addition, this section also considered syncretisms of the full forms, arguing that AAB patterns are attested, while ABA ones are absent.

Section 4 argued that both CMPR and SPRL need to be further decomposed into two heads. It did so on the basis of Czech comparative morphology, discussed in Caha et al. (2019a), and its interaction with suppletive adjectival stems. The same type of evidence from Latin superlatives, discussed in De Clercq & Vanden Wyngaerd (2017), allowed us to argue for the decomposition of SPRL.

Finally, section 5 considered the question whether the positive is always fully contained in the comparative. We argued that there are not only semantic, but also morphological arguments from Slovak comparative morphology (discussed in Vanden Wyngaerd et al. 2020) to argue for a type of structure where the positive is a 'gapped' comparative.

## **Authors' contributions**

The four authors have made an equal contribution to this paper.

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