

# Universals in Comparative Morphology



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Suppletion, superlatives, and the structure of words

Jonathan David Bobaljik

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# Abbreviations

1/2/3 S/P	first/second/third person singular/plural
A.SPRL	absolute superlative
ABL	ablative
ACC	accusative
ADD	additive
ADESS	adessive
ADJ	adjective
ADNOM	adnominal
ADV	adverb
Anc. Greek	Ancient Greek
<i>CGEL</i>	<i>Cambridge Grammar of the English Language</i> (Huddleston and Pullum 2001)
Cl. Greek	Classical Greek
CMPR	comparative
<i>COCA</i>	Corpus of Contemporary American English <a href="http://corpus.byu.edu/coca/">http://corpus.byu.edu/coca/</a>
CONV	converb
COP	copula
CSG	The Comparative-Superlative Generalization
CΔG	The Comparative-Superlative Generalization
DAT	dative
DECL	declarative
DEF	definite
DM	Distributed Morphology
DWB	<i>Das Deutsche Wörterbuch</i> (Grimm and Grimm 1854-1961)
ELAT	elative
EMPH	emphatic
FACT	factive
FS	feminine singular
GEN	genitive

INCEPT	inceptive
INFIN	infinitive
INST	instrumental
INTNS	intensifier
INTR	intransitive
LOC	locative
LV	linking vowel
MS	masculine singular
NEG	negative
NEU	neuter
NML	nominalizer
NOM	nominative
NPI	negative polarity item
NS	neuter singular
OBJ	object
OCS	Old Church Slavonic
<i>OED</i>	<i>Oxford English Dictionary</i>
PART	
U.R.	Underlying Representation
PIE	Proto Indo-European
PL	plural
POS	positive
PRD	predicator
PREF	prefix
PRES	present
PROG	progressive
PST	past
PTCP	participle
REFL	reflexive
REV	reverse
RSG	The Root Suppletion Generalization
Scand.	Scandinavian
SG	singular
SPRL	superlative
SSG	The Synthetic Superlative Generalization
SUBJ	subject
TOP	topic
TV KAREL.	Tikhvin Karelian

UG	Universal Grammar
v	verb
VIP	The Vocabulary Insertion Principle
VM	verb marker
WDG	<i>Wörterbuch der deutschen Gegenwartssprache</i> <a href="http://www.dwds.de/">http://www.dwds.de/</a>



# Chapter 1

## Introduction

### 1.1 Introduction

Morphology is sometimes characterized as the domain of the lawless, and among the miscreants, no process epitomizes irregularity more than suppletion — the wholesale replacement of one stem by a phonologically unrelated stem — as in the comparative and superlative degree of adjectives (*good* – *better* – *best*). I argue, based on a large, cross-linguistic survey (xx languages), that there are nevertheless strikingly robust patterns in this domain, robust enough to be solid contenders for the status of linguistic universals.

One goal of this study is to offer theoretical explanations for these generalizations. In the course of developing an analysis, I will argue that the assumptions needed bear on choices among theoretical frameworks, with the framework of *Distributed Morphology* having the right architecture to support the account. In addition to the theoretical implications of the generalizations, I suggest that the striking patterns of regularity in what otherwise appears to be the most irregular of linguistic domains provides compelling evidence for Universal Grammar (UG). The core theoretical claim will amount to saying that certain types of meaning cannot be expressed monomorphemically. A central example is the superlative, as in English *biggest*. I contend that no language has a true superlative morpheme that attaches to adjectival roots. Apparent examples, such as English *-est*, have in fact a richer structure, where the superlative-forming element always embeds a comparative, (roughly): [[[ ADJECTIVE ] COMPARATIVE ] SUPERLATIVE ]. This structure is transparent in many languages (see Chapter 3). The argument for UG here

constitutes in some ways a twist on the familiar logic of the poverty-of-the-stimulus. Within any one language, suppletion is far too scant a phenomenon for any patterns observed to emerge as significant. Thus, if there are universal generalizations to be had (as I contend there are), the significance of these can only be appreciated in their cross-linguistic scope. Thus a second goal of the book is a contribution to the search for the basic building blocks of grammatical meanings — morphological primitives.

Over the course of the book I contend that the following generalizations have the status of linguistic universals. Various clarifications are discussed as we proceed, and apparent counter-examples are addressed, with alternative accounts provided. The first generalization is the Comparative-Superlative Generalization (CSG), in two parts, extending observations in Ultan (1972).

- (1) The Comparative-Superlative Generalization, part I (CSG1):  
If the comparative degree of an adjective is suppletive, then the superlative is also suppletive (i.e., with respect to the positive).
- (2) The Comparative-Superlative Generalization, part II (CSG2):  
If the superlative degree of an adjective is suppletive, then the comparative is also suppletive (i.e., with respect to the positive).

The two parts of the CSG require that an adjective that is suppletive in gradation will be suppletive in both the comparative and superlative grades (relative to the basic, positive root). The CSG allows for patterns such as *bad – worse – worst*, with the a suppletive root common to both comparative and superlative, and for patterns such as Latin *bonus – melior – optimus* ‘good – better – best’, with distinct roots in all three grades. What is disallowed (and virtually unattested) is a pattern in which only the comparative *\*good – better – goodest* or only the superlative *\*good – gooder – best* shows suppletion. Two important terminological clarifications should be made here. First, by *superlative* here and throughout I refer only to *relative superlatives*, meaning ‘more X than all others’; the generalizations do not extend to what are sometimes called *absolute superlatives* (also called *elatives* in some traditions). These latter have the meaning ‘X to a very high degree’. For example, in Italian, there is a distinction between relative superlatives (formed by adding the definite article to the comparative): *il migliore* ‘the better’ = ‘(the) best’, and absolute superlatives (marked by the suffix *-issim-*) *buonissim-o* ‘very, extremely good’. Absolute superlatives are not subject to the generalizations laid out here, evidently because they lack the comparative component of meaning (and hence structure).

A second clarification regards the term *suppletion* itself. I take suppletion not to represent a point on a cline of irregularity (contrast Wurzel 1985), but instead see a categorial divide between suppletion (a relation holding among distinct exponents, or vocabulary items, as in *go – went*) and other forms of irregularity such as ablaut (which involve phonological changes to a single underlying exponent, as in *tell – told*). I return to these points in more detail below, in particular presenting arguments for a distinction between suppletion and readjustment rules in Chapter 5. For now, I simply mention these clarificatory points as they are important to understanding the scope of the generalizations under scrutiny. On suppletion generally, as well as differing uses of the term, see Mel’čuk (1994) and Corbett (2007).

Two further generalizations to be discussed are the following:

- (3) The Synthetic Superlative Generalization (SSG)  
No language has morphological superlatives (*X-est*), but only periphrastic comparatives (*more X*).
- (4) The Root Suppletion Generalization (RSG)  
Root suppletion is limited to synthetic (i.e., morphological) comparatives.

The SSG constitutes the claim, independent of suppletion, that no language shows a regular pattern analogous to *\*long – more long – longest*, in which the comparative is exclusively periphrastic, where the superlative is morphological. (The terms periphrastic and morphological in this sense are interchangeable with analytic and synthetic, respectively, and I will alternate among these at points below.)

The RSG adds to this the claim that no language shows suppletion of the root in periphrastic comparatives: *\*good – more bett*. There is a subtlety to the formulation of the RSG that should be mentioned here, in light of Modern Romance languages such as French and Italian, in which regular comparatives are all periphrastic, but which have a handful of suppletive forms. The key point to keep in mind is that suppletion, in the normal case, involves a substitution of roots, but leaves functional morphology intact. Thus *bett-er* in place of *\*good-er*, preserves the comparative affix *-er*, and this is characteristic of the significant majority of examples of suppletion. While suppletion does appear to compete or alternate with periphrastic constructions in some languages — thus Italian: *buon-o* ‘good’ may be compared periphrastically: *più buono* or suppletively *migliore* (both ‘better’) —

no language shows root suppletion with (obligatory) preservation of the comparative morpheme, when the latter is free standing. The introduction is not the place to explore the subtleties here, but I signal the point here since the examples are likely to be familiar to many readers (Romance superlatives are the focus of section 3.3.2).

Yet another generalization concerning the morphological expression of degree is the following.

- (5) Lesslessness  
 No language has a synthetic comparative of inferiority.

Comparison of superiority ('more X') is affixal in many languages, as in *long – long-er*, but comparison of inferiority ('less X') never is; schematically: *more X : X-er :: less X : \**. This last generalization is the most unquestionably robust of the lot.<sup>1</sup> For the generalizations in (1)-(4), there are apparent challenges which must be (and can be) addressed. But (5) is surface true without even a hint of a problematic case in the 300 languages examined for the present study. The generalization is discussed in Chapter 7.

The hypothesis that lies at the core of the proposals in this work can be phrased as the Containment Hypothesis, given in (6):

- (6) The Containment Hypothesis  
 The representation of the superlative properly contains that of the comparative

Subject to some qualifications, the central claim is that (7a) is a possible representation, but that (7b) is universally disallowed.

- (7) a. [ [ [ ADJECTIVE ] COMPARATIVE ] SUPERLATIVE ]  
 b. \* [ [ ADJECTIVE ] SUPERLATIVE ]

The Containment Hypothesis stands at the heart of the account of (1), (2) and (3). These generalizations are shown to follow from (6) on a small set of independently motivated, general theoretical assumptions. The most important among these are given in (8), discussed in more detail below:

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<sup>1</sup>This generalization is mentioned tentatively in Cuzzolin and Lehmann (2004, 1213), with no indication of the sample size they drew on. I have found no other mention of this in the literature (other than in the descriptions of individual languages), nor any systematic survey, though I imagine it is widely suspected.

- (8) a. **Late Insertion** — the (abstract) morpho-syntactic representation is the input to a morphological component, characterized in part by rules of exponence (vocabulary insertion) which assign phonological realizations to the terminal nodes.
- b. **Underspecification, Elsewhere Ordering** — the rules of exponence (vocabulary insertion) may be underspecified, and thus may compete to realize a given node; such competition is resolved by the Elsewhere (Subset, Pāṇinian) ordering, in which more specific rules take precedence over more general ones.
- c. **Locality** — morphological rules are constrained to operate under strict conditions of locality; in certain configurations, an erstwhile trigger of a given rule may be too far away to trigger that rule. Structural adjacency may be a condition on certain types of rule (rules of exponence, readjustment rules).

How these are to be made precise, and how they interact with the Containment Hypothesis to derive the generalizations given above, is the focus of Chapters 2-5.

An important further question addressed here is how (6) is to be formalized, and relatedly, why it should hold. Though somewhat tentative, I will suggest that the impossibility of (7b) is a consequence of a general limit on the complexity of individual morphemes. That is, at least for the functional or grammatical (as opposed to lexical) vocabulary, there are intrinsic limits on possible morpheme meanings. I suggest that the meaning ‘more than all others’ is, by this criterion, too complex to be expressed monomorphemically, and must therefore be split into (at least) a piece meaning ‘more’ and another meaning (roughly) ‘than all (others).’ The containment hypothesis in (6) and (7) is thus not itself a part of UG, but rather a consequence of a far more general condition. Some rather speculative remarks on this theme, including how it may underlie an account of (5), and how it connects to proposals regarding impossible morphemes in other empirical domains (see Kayne (2005), Bobaljik (2008), Hackl (2009)), occupy Chapter 7.

In addition to the generalizations just considered, the following emerges as a strong trend in the data, with surprisingly many (but not all) *prima facie* counter-examples readily accounted for in other terms.

- (9) The Comparative-Change of State Generalization (CΔG):

If the comparative degree of an adjective is suppletive, then the corresponding change-of-state verb is also suppletive (i.e., with respect to the positive adjective).

In a manner strongly reminiscent of the missing *\*good – better – goodest* patterns with superlatives, the more spotty domain of deadjectival verbs is well populated with patterns such as *bad – worse – (to) worsen*, but precious few examples show the corresponding verb derived from the positive root: *good – better – \*to gooden*. Though it is less robust than the other generalizations considered here, its formal parallel to (1) warrants consideration. I examine the CΔG in Chapter 6, considering in particular the implications of a parallel to the containment hypothesis (6) in this empirical domain, as against more traditional proposals for the lexical semantics of deadjectival degree achievements (cf. Dowty 1979).

The study itself begins in earnest in Chapter 2. In the following sections, I present some additional background remarks which some readers may find useful. Section 1.2 discusses some core theoretical assumptions that will come up in the course of the work. Section 1.3 discusses the nature of the datasets used for this study, and some of the choices made in aiming for a balance between diversity of languages and comprehensive coverage of the data. The phenomena of core interest show a significant areal concentration, with comparative suppletion largely unattested outside of a Greater European area, a fact that poses a special challenge to what is fundamentally a quantitative claim about the significance of gaps in the data. Section 1.4 provides an extremely brief review of prior literature on the typology of comparative constructions.

## 1.2 Distributed Morphology

One contribution of the present study is intended to be empirical, and to the extent possible, I have characterized core descriptive results in a relatively neutral vocabulary. In addition, I have taken pains to present the theoretical argument, in particular in Chapter 2, in terms that are as general as possible, in order to permit fair comparison with alternatives across theoretical frameworks. That said, one of the goals of the current work is to argue that a particular set of assumptions is required in order to explain the generalizations above. I take it that as uncontroversial that a key component of explanation in this sense is not only to be able to describe the attested

patterns, but also to exclude the unattested patterns; all six generalizations presented in the previous section describe gaps in the data, which, I argue at length below, are systematic, rather than accidental. I contend that the framework of Distributed Morphology (DM) has the right general architecture to support the assumptions needed to derive these generalizations. It is not clear that competing morphological frameworks do. If correct, then this book constitutes an argument for that general theoretical framework. With that in mind, it seems of use to lay out here some of the relevant aspects of DM (and associated terminology) that I will appeal to in the course of the accounts to be developed below. This section does not aim for a comprehensive overview of the framework (see Halle and Marantz 1994, Harley and Noyer 1999, Embick 2010, Ch. 2 and Bobaljik In preparation), but aims only to present some key notions that play a role in what follows.

The most important aspect of DM for the theory of comparative suppletion to be developed here is the treatment of *competition* and *blocking* in allomorphy. Distinct phonological matrices compete to realize (combinations of) grammatical features, in different contexts. To take a well-worn case, there are in English, as in many languages, a variety of *exponents* of the grammatical feature PLURAL, with irregular (lexically restricted) exponents taking precedence over the regular, default spelling out of the plural feature, wherever available: thus *ox-en*, *sheep-Ø* rather than *\*ox-es*, *\*sheep-s*. As has been widely noted, such competition effects imply that morphology is *realizational*, incorporating some version of the *Separation Hypothesis* (Beard 1995, with many antecedents noted therein), which holds that the derivation of the morphological representation of complex words is separate from (and prior to) the spelling out or realization of those representations.

In the DM instantiation of this general approach, *Rules of Exponence* (equivalently, of *Vocabulary Insertion*) provide the phonological realization for morphosyntactic representations, held to be derived by the syntax (hence insertion is *Late*, as opposed to the *early*, pre-syntactic insertion characteristic of Lexicalist frameworks. Examples of some rules of exponence for English are given in (10); collectively, the rules of exponence for a language are referred to as the *vocabulary* of the language.

- (10)
- |    |                      |   |          |  |
|----|----------------------|---|----------|--|
| a. | PRES 3 SG            | → | -s =/-z/ |  |
| b. | PRES                 | → | ∅        |  |
| c. | PL                   | → | ∅        | / ] <sub>N</sub> ___ where N = <i>sheep, foot, ...</i> |
| d. | PL                   | → | -en      | / ] <sub>N</sub> ___ where N = <i>ox</i>               |
| e. | PL                   | → | -s =/-z/ | / ] <sub>N</sub> ___                                   |
| f. | CMPR                 | → | -er      |  |
| g. | $\sqrt{\text{GOOD}}$ | → | be(tt)-  | / ___ ] CMPR   |
| h. | $\sqrt{\text{GOOD}}$ | → | good     |  |
| i. | $\sqrt{\text{BIG}}$  | → | big      |  |
|    | ...                  |   |          |  |

A few words on notational conventions here: the rules relate a grammatical feature matrix (in CAPS) to a phonological representation. For ease of exposition, I use standard orthography as a proxy for the phonology throughout this book. Rules of exponence may be context-free or context-sensitive, where the context may include idiosyncratic lexical restrictions (as in (10c-d)). In my presentation of the rules of exponence, I use the symbol  $\rightarrow$  to express the relationship these rules represent, taking it to be one of rewriting of features with their exponents (see Halle 1990, Trommer 1999, Bobaljik 2000b). Another formalism within DM uses  $\Leftrightarrow$  expressing correspondence, rather than rewriting (see Halle and Marantz 1993, Embick 2010). Nothing of consequence turns on this distinction in the present work.

The entries in (10a-f) provide exponents for the functional (i.e., grammatical) vocabulary of the language, constituted by grammatical features (these features should be understood as shorthand for a more sophisticated feature analysis, or decomposition into grammatical primitives). By contrast, the vocabulary entries for *Roots* (10g-i), indicated as  $\sqrt{\text{ROOT}}$ , are not to be understood as features, but rather as identifiers for individual roots, abstracting away from allomorphy. It will be crucial to the analysis of competition in suppletion that *good* and *bett-* be seen as manifestations of a single abstract root; hence, rules of exponence must apply to roots (Beard's 1995 Lexemes; *l*-morphemes in the terminology of Harley and Noyer 1999) as well as to grammatical morphemes, an assumption that is incompatible with the framework of Beard (1995).<sup>2</sup> Beyond that simple point, I take no stand on the correct representation of these identifiers; for the vast majority of lexical roots, the identifier may just as well be the (or a) phonological representa-

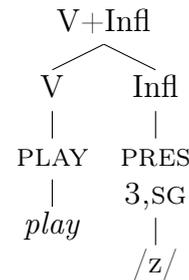
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<sup>2</sup>For differing views on this point within DM, see Embick (2010, 193, n1) and Marantz (1996, 2007).

tion, making exponence for these roots trivial. Where there is no risk of confusion, I will often omit the root symbol in vocabulary fragments given below.

Given representations such as (11), the rules in (10) will apply to provide exponents to the various nodes (for (11a) I have given a labeled partial tree diagram; for the others only more abbreviated representations with information omitted not relevant to the point):

(11) a. [ [  $\sqrt{\text{PLAY}}$  ]<sub>V</sub> PRES,3,SG ]



b. [ [  $\sqrt{\text{DOG}}$  ]<sub>N</sub> PL ] = *dog-z*

c. [ [  $\sqrt{\text{OX}}$  ]<sub>N</sub> PL ] = *ox-en*

d. [ [  $\sqrt{\text{BIG}}$  ]<sub>A</sub> CMPR ] = *big-er*

e. [ [  $\sqrt{\text{GOOD}}$  ]<sub>A</sub> CMPR ] = *bett-er*

Where more than one rule is compatible with a given node, competition is regulated by the *Elsewhere Condition* (Kiparsky 1973), which may be formulated as in (12):<sup>3</sup>

(12) If two (incompatible) rules  $R_1$ ,  $R_2$  may apply to a given structure, and the context for application of  $R_2$  is contained in that of  $R_1$ , then,  $R_1$  applies and  $R_2$  does not.

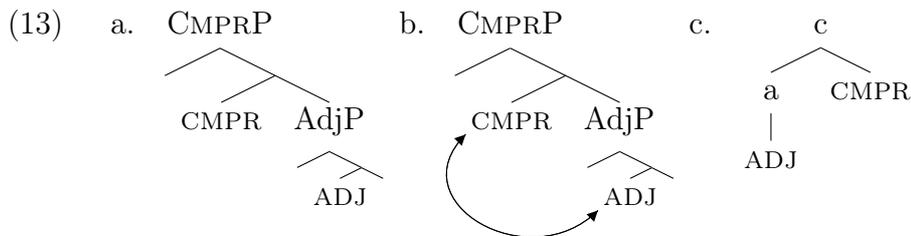
The Elsewhere Condition, as widely discussed, applies to force the choice of an irregular allomorph over a competing regular one, as in, for example the plural *ox-en* in (11c). Rule (10d) bleeds application of rule (10e) in (11c),

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<sup>3</sup>Compare Halle's 1997 formulation of the *Subset Principle* which combines the Elsewhere Condition as a condition regulating rule interaction, with a general condition on rule application that a rule may apply only when its structural description (including contextual restrictions) constitutes a subset of the context being considered. Thus, a rule may not apply if its description includes features that are not part of the node to which insertion applies.

by the Elsewhere Condition. (It is understood that rules are disjunctive, and only one rule of exponence may apply to a given node in the general case. Disjunctivity of rules satisfies Kiparsky’s incompatibility condition on the application of (12).)<sup>4</sup> In a similar manner, (12) ensures that (10a) and not (10b) is inserted in the inflectional position in (11a), yielding *(She) play-s*, rather than *play-Ø*, even though the description for (10b) is met. Finally, in the realm of root allomorphy, and directly relevant to the rest of this book, the Elsewhere Condition forces a contextually-restricted allomorph (10g) to *block* insertion of a context-free allomorph of the same root (10h), when the context for insertion is met, as in (11e). This derives *bett-er*, rather than *\*good-er* as the comparative of *good*. See Embick and Marantz (2008) for further discussion of blocking in DM, and comparison to alternative conceptions.

Working backwards through the derivation, the representations that are the input to vocabulary insertion are taken to be derived, in the first instance, in the syntax, though they are subject to additional post-syntactic manipulations in some cases. We may take one example that will figure in the discussion of the RSG and SSG in Chapter 3. Among the abstract morphemes of English, along with a slew of adjectival roots, is a morpheme CMPR which combines with adjectives to yield the comparative. As is well known, English comparatives have both a periphrastic and a synthetic guise: *more polite* and *polit-er*, respectively. In a DM account (see Embick and Marantz 2008), a single syntactic structure underlies both the periphrastic and synthetic expressions, namely, that in (13a).



Sticking to the basic case, a periphrastic comparative like *more polite* arises when (13a) is subject to vocabulary insertion, with the comparative

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<sup>4</sup>See also Anderson (1992), Stump (2001) on disjunctive rule application. In contrast to these theories, DM holds that the locus of disjunctivity is the terminal node, thus ‘rule blocks’ are in the general case featurally coherent. However, DM provides mechanisms for manipulating the structure after syntax but prior to vocabulary insertion, which allows for the description of departures from a 1:1 mapping of terminal nodes to exponents. See Halle and Marantz (1993), Noyer (1997) for discussion and comparison with the framework of Anderson (1992) in particular.

element (pronounced as *more*) and the adjective in separate maximal projections. A synthetic construction arises when some operation M indicated by the arrow in as in (13b), combines the two terminal nodes into a single complex head yielding (13c), cf. (11d)-(11e). The theory provides a variety of options for the identity of M, including Head Movement (either in, or after, the syntax) or the operation Morphological Merger (Marantz 1989)<sup>5</sup>, or perhaps others (cf. Embick and Noyer 1999, for an array of options). Very little, if anything, in the current study hinges on what M is in any given example, and so I will remain generally agnostic throughout. For concreteness, and for consistency with the analysis of reinforcing adverbs in section 3.3.1, I will use a downward-pointing arrow in trees such as this, thus taking M as (Lowering via) Merger. (The various operations that are candidates for M may differ in the labels they would assign to the nodes in (13c), for example, in whether CMPR is adjoined to ADJ or vice versa; I intend to remain agnostic here and use lowercase letters simply as mnemonic devices to refer to various nodes.)

In the view that the input to morphology is a syntactic representation, DM stands in contrast to other realizational frameworks such as versions of Word-and-Paradigm models (Matthews 1972, Anderson 1992, Stump 2001) as well as Aronoff (1994) and Beard (1995). In many of these frameworks, which reject the idea that syntax is the source of the concatenation and arrangement of grammatical features, the morphosyntactic feature bundle is unstructured. Effects of affix order are the product of stipulated rule ordering, for example, by ordering rules of exponence into disjunctive rule blocks (Anderson 1992). In the course of this book, I contribute to the argument for a syntactically structured morphosyntactic representation. Specifically, there appear to be locality conditions on allomorphy that require the kind of hierarchically structured input representation that DM posits but which competing theories reject.

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<sup>5</sup>Marantz (1989, 261) defines Morphological Merger as follows:

- (i) At any level of syntactic analysis (d-structure, s-structure, phonological structure), a relation between X and Y may be replaced by (expressed by) the affixation of the lexical head of X to the lexical head of Y

The core cases of Merger encompass rebracketing under adjacency as an account of certain cliticization effects: [ X [ Y ... ] ]  $\rightarrow$  [ X+Y ... ], and the affixation of a head X to the head of its complement, as in affix-hopping: [ X [<sub>YP</sub> Y ] ]  $\rightarrow$  [<sub>YP</sub> X+Y]. In practice, Merger of the affix hopping type tends to effect a lowering operation, though this is not strictly a part of the definition. See Bobaljik (2002a) for more discussion.

The argument begins from the assumption that rules of exponence operate cyclically, beginning with the root (cycle-based theories of locality within DM are offered in Bobaljik (2000b) and Embick (2010)). A first consequence of such cyclic approaches is that some form of *No Lookahead Condition* will hold (e.g., Simpson and Withgott 1986, 155). To start their example, the derivation of the English word *cliticization* [[[ clitic ] iz(e) ] ation ] proceeds in steps, adding *-ize* to the stem *clitic* on the first cycle, and adding *-ation* to the result on a second cycle. In the first cycle, when *-ize* is added, information is available about the stem (e.g., that it is a noun), and hence this may constrain the process (for example, triggering allomorphy). However, no information is available about what will happen in the second cycle: thus information about the more peripheral suffix may not condition processes such as allomorphy for the first suffix. To do so would involve ‘looking ahead’ to a subsequent cycle. In other words, as the complex word is constructed, one condition on allomorphy for a given affix is that it may only be sensitive to information already present in the morphological structure at the time that affix is added.

In the domain of inflection, No Lookahead in its strongest form is too strong. As (Carstairs-McCarthy 1992, 214) puts it: “[i]t is as if inflectional realisation operates on the basis of precise information about what has already been spelled out . . . , but only vague information about what has yet to be spelled out.” Though differing in detail, cyclic approaches which posit a structured morphosyntactic representation as the input to rules of exponence derive something weaker than Simpson and Withgott’s No Lookahead, and more in line with Carstairs-McCarthy’s description: a rule of exponence at the root may be conditioned by information that is part of the representation at that stage of the derivation, namely, the morphosyntactic properties of the higher nodes, but not their phonological form.<sup>6</sup>

In addition to the cyclicity condition, two other locality conditions play a role in the current work. One condition, at least as a working hypothesis, is that a morpheme (or feature)  $\beta$  may condition allomorphy for morpheme  $\alpha$  only if the two are in the same morphological “word” (i.e., complex  $X^0$ ):  $\beta$  may condition allomorphy for  $\alpha$  in the environment in (89a) but not that in (89b), where a maximal projection intervenes (abstracting away from linear order). (An alternative formulation, in line with Embick (2010), would make reference to *phases* or *cyclic nodes*, in place of maximal projections, in

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<sup>6</sup>This is a matter of ongoing debate, see Bonet and Harbour To appear, Embick 2010 for current discussion.

(89b), relating the condition more closely to the discussion of cyclicity in the preceding paragraph.)

- (14) a.  $\alpha \dots ]_{X^0} \dots \beta$   
 b.  $*\alpha \dots ]_{XP} \dots \beta$

The RSG (4) falls out as a special case of this broader condition. The Italian root  $\sqrt{\text{GOOD}}$  mentioned above has two allomorphs: the comparative *miglior-* and the elsewhere form *buon-*. To a first approximation, Italian grammar treats operation M in (13b) as optional — if M applies, the suppletive root is required, but if M does not apply, then the head CMPR is insufficiently local to the root, and suppletion is not triggered, giving: *piú buono* ‘more good’.

Evidently, (89) is a necessary, but not a sufficient condition on locality for contextual allomorphy. Even within a complex  $X^0$  there appear to be locality conditions at work. Thus, in the structure in (15), for at least some values of X, Y is unable to condition root allomorphy.



A strong proposal is that any X serves as an intervener between Y and the root in (15), in essence, a condition of structural *adjacency* on root allomorphy, as proposed in one form or another by various authors (Siegel 1978, Allen 1979, Embick 2003, 2010).<sup>7</sup> A structural adjacency condition appears to be somewhat too strong as a general condition on contextual allomorphy (see Carstairs 1987, Bobaljik 2000b, Chung 2007b) but in the current study, adjacency makes the right divide in a number of interesting cases. I will therefore tentatively adopt the adjacency condition as part of the theory of locality for root allomorphy, leaving it to a future project to understand why adjacency might not restrict affixal allomorphy (Bobaljik 2000b), as well as

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<sup>7</sup>Embick (2010) proposes a condition of linear adjacency, in addition to a domain-based structural condition. In essence, Embick’s theory incorporates strict adjacency, but allows for the deletion or ‘pruning’ of X when X is non-overt.

reconciling this with the sporadic apparent counter-examples in the literature just mentioned (see the exchange in Bobaljik 2000b, Carstairs-McCarthy 2001, 2003, Adger et al. 2003 for pertinent discussion).

It is in this last, and narrowest sense of locality, that the DM approach clearly parts company with competing realizational theories that assume no hierarchical structure among the abstract, grammatical features. In theories such as those in Anderson (1992), Stump (2001), where the morphosyntactic representation is unstructured, with word structure given by the rules of exponence, there is no obvious sense of ‘higher nodes’ in the morphosyntactic representation — no sense in which ‘adjacency’ can be defined or evaluated relative to the abstract features that serve as the input to the rules of exponence (as opposed to adjacency among the exponents, which is readily definable). If an adjacency condition in this sense (or something like it) is substantiated (as argued for in this work), this serves as a further argument for word-internal hierarchical arrangement of grammatical features prior to vocabulary insertion.

A final aspect of the framework that should be mentioned here, and one that has received less attention to date, is the treatment of portmanteau morphology — *cumulative exponence* in the terminology of Matthews (1972, 1991). In some instances, a single phonological string appears to correspond to multiple terminal nodes of the (morpho-)syntactic representation. Contrast *bett-er*, the comparative of  $\sqrt{\text{GOOD}}$ , which appears to contain the regular comparative suffix *-er* alongside the suppletive root allomorph, with *worse*, the comparative of  $\sqrt{\text{BAD}}$ , which appears to express simultaneously the root meaning and the comparative. The theoretical framework adopted here presents at least two ways of approaching portmanteaus (and no reason to suspect that all will fall to the same treatment).

On the one hand, the general structure of comparatives  $[[ \text{ADJ} ] \text{CMPR} ]$  can be maintained even for the *worse* case, but with mutually-conditioned contextual allomorphs:  $\text{BAD} \rightarrow \textit{worse} / \_\_ ] \text{CMPR}$ , and  $\text{CMPR} \rightarrow \emptyset / ]_{A^+} \_\_ ]$ , where  $A^+ = \textit{worse, less}$ . This approach would preserve the structure for English comparatives unchanged even for the portmanteaus, and essentially recapitulates history, where the deletion of *-er* had a phonological motivation. Note that the overwhelming majority of root suppletion is of the *bett-er* type, preserving derivational and inflectional morphology beyond the root.

On the other hand, one could treat the exponent *worse* as a true portmanteau, spelling out both the root and the comparative elements:  $\text{BAD}, \text{CMPR} \rightarrow \textit{worse}$ , inserted at the top node in (13c). Radkevich (2010) pro-

poses to allow insertion at non-terminal  $X^0$  nodes in exactly this way (see also Neeleman and Szendrői 2007, Caha 2009), with a specific proposal as to how to restrict application of this mechanism to avoid overapplication. Equivalently, an operation of Fusion may be invoked (Halle and Marantz 1993, see also Bobaljik 1997, Chung 2007b) to combine the two terminals in (13c) into a single node prior to the application of rules of exponence.

As it happens, there is perhaps an argument in the domain of comparatives for treating (some) portmanteaus as complex exponents (either with fusion, or insertion at complex nodes) rather than a conspiracy of mutually conditioned allomorphs. The argument has to do with the locality conditions mentioned above. Recall from section 1.1 that alongside suppletive patterns like *good – better – best* (with a common allomorph in the comparative and superlative), patterns are also attested with three distinct root allomorphs, such as Latin *bonus – melior – optimus* ‘good – better – best’. The Latin pattern poses a prima facie challenge to the adjacency condition on allomorphy in that the superlative is, by the Containment Hypothesis, never structurally adjacent to the root, yet there is clearly root allomorphy conditioned by the superlative in this example. However, combining the non-terminal-insertion or fusion approach to portmanteaus with the adjacency condition on allomorphy allows for a narrow loophole to adjacency, with a clear prediction, stated here:

- (16) The superlative may only condition root allomorphy (distinct from the comparative), when the root and comparative are expressed by a portmanteau.

The prediction is indeed borne out (see Chapter 5 for a discussion of why this should hold), although the number of relevant examples is small enough that we cannot be confident this is not an accident. It is worth mentioning here, though, as it illustrates on the one hand how the various assumptions interact, and on the other, how surface violations of conditions (such as adjacency) may arise as the product of the interaction of various principles at some level of abstraction.

While there is far more that should be said about the theoretical framework, the discussion above will I hope provide more than sufficient background for the material to be discussed in the next chapters. Chapter 5 returns to more of the fine detail of the theory, after Chapters 2 and 3 which are presented in broader terms.

### 1.3 Constructing the Database

The results reported here are drawn from the investigation of just under 300 languages, representing an attempt to strike a balance between the opposing demands of representing areal and genetic diversity on the one hand, and achieving a comprehensive catalogue of attested examples of suppletion in comparative and superlative morphology. The assembly of the data may be thought of as a three-stage procedure, and this approach is reflected in the presentation of the results in Appendixes A-B, as well as Chapter 4.

The first stage, reported in Appendix A, is a broad sample of 143 languages, representing approximately 40 families and a dozen or so isolates (using the classifications at Bickel and Nichols (1996ff) and <http://multitree.linguistlist.org/> as a rough guide, with no implied commitment to these classificatory schema). Languages were included in this sample on a quasi-random basis, with availability of descriptions leading to some skewing.<sup>8</sup> Multiple languages were chosen from most families, as there is variation in the expression of comparison even within a single family, sometimes striking variation among closely related languages.

While the broad sample is used for verifying the empirical generalizations discussed above, the broad sampling method proves to be not particularly illuminating in this regard as the majority of the world's languages satisfy the interesting generalizations for rather trivial reasons. Most languages, for example, lack ABA patterns in superlative adjectival suppletion because they lack suppletion in gradation, lack superlatives, or lack adjectives altogether. Thus, the primary function of the broad sample lies in identifying regions and families with the morphological properties of interest to the present study (suppletion in adjectival gradation, morphological comparatives or superlatives). Combining the results of the broad sample, along with a literature review and a *LinguistList* query, I assembled a second survey, whose aim was for comprehensiveness, rather than breadth — to have as many data points

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<sup>8</sup>A large number of grammatical descriptions, in particular older descriptions of languages of the Americas, provide no information on how comparison is expressed. Many of these languages may well have no clear comparative construction and/or may be classified in the 'conjoined' type (see 1.4). In choosing representatives for a given family, stock or area, some priority was given to languages discussed in previous typological surveys of comparison (Ultan 1972, Stassen 1985, 2008) to facilitate comparability across studies, although this proved impractical in many cases (either due to difficulty in obtaining data, or since many of these studies include an overabundance of languages from some families).

as possible from languages with comparative suppletion and/or morphological superlatives. To this end, I telescoped in (as it were) on languages which have evidence of morphologically marked grades of comparison (from the first survey and the literature review), and then expanded outwards to languages closely related to the core sample, to the extent grammatical descriptions were available. The results of this focused survey are presented in Appendix B. This second sample includes 169 languages (of which 20 are from the broad sample). Approximately 2/3 of these languages have morphological comparative forms (somewhat fewer have morphological superlatives), and of these, approximately 70 show examples of comparative suppletion. A striking areal skew emerges at this point: morphological marking of comparative and superlative is attested (though not common) around the globe, but the confluence of both suppletive comparatives and morphological superlatives (central to investigating the CSG) appears to be limited to languages historically from Europe and its closest neighbours — a Greater European Sprachbund.

Despite the concerns this areal concentration raises for a universalist perspective, there is sufficient variation in the data from this group of languages for interesting and significant patterns to emerge. In light of the fact that many of these languages are closely related, however, counting languages in a survey of this type becomes increasingly problematic (see Bickel 2008 and references therein). To see the problem, consider the English triple *good – better – best*, a pattern consistent with the CSG. German also has a CSG-consistent ABB pattern for the corresponding adjective: *gut – besser – (am) besten*, indeed so do almost all known Germanic languages present and past, cf. Gothic *gōps – batiza – batists*. Yet surely the facts from each of these individual languages are contingent facts of their history; ultimately, the entire Germanic ‘good’ paradigm represents but a single innovation, somewhere in the prehistory of Northern Europe. In assembling the actual data presented below, in order to mitigate against the influence of borrowing and common inheritance, I took the approach of counting cognate sets, rather than languages, counting only one exemplar for each cognate triple of the form *positive – comparative – superlative*. A comprehensive listing of attested suppletive triples (positive – comparative – superlative) is given in Chapter 4. In order to be counted there, the pattern must differ in at least one of the roots from a pattern already in the dataset (see section 2.3.2 for elaboration). This avoids questions of defining and counting languages. We need not take a stand on whether Norwegian and Swedish, or Serbian and

Croatian, are distinct languages, or how many stages in the history of English, we should recognize. The Germanic ‘good’ triple contributes a single data point. Some triples like this thus represent numerous languages over a wide time period, while other triples may be contributed to the data set by a single dialect, for example the Giazza Cimbrian (German) *guot – beg-ur – beg-ur-ste* ‘good – better – best’, for which the comparative and superlative have a different etymological source from German *besser* and English *better* (see Schweizer 2008, 397, and section 2.3.2 below).

Approached this way, the generalizations remain robust, despite the concern of an areal concentration. As regards the CSG, there are more than 100 distinct cognate triples reported in Chapter 4 — some 70 of these are for qualitative adjectives (with only one potentially problematic example). Quantifiers such as ‘much/many’ and ‘few’ (which add additional complexities) contribute nearly 40 additional triples, with a handful of apparent challenges. The full dataset is presented in Chapter 4, with problems and qualifications discussed in the relevant chapters below. Moreover, although comparative suppletion is unquestionably an areal phenomenon, there is sufficient variation within the languages that have it to raise the questions addressed here — why are some patterns attested and others not? Simply noting that abstract patterns may be resilient to change over time provides an insufficient answer. The patterns that are attested do change – suppletion arises and is lost, doublet patterns come into being or fall out of use, etc. Of the various ways in which one could characterize patterns in the data, most are in fact not stable over time — what is stable is precisely the generalization that the attested (or reconstructible) changes do not yield AAB and ABA patterns in this domain. What this study aims to provide is an account of why, in a sea of irregularity, these particular generalizations constitute an island of stability. More discussion of these issues occupies the latter part of Chapter 2, after more details of the theory and its empirical basis are presented.

## 1.4 Comparative Typology

A final array of useful background information for this study concerns the typology of the expression of comparison, and the place of this study in relation to the previous work. In broad terms, an expression of comparison has three principal parts: a predicate denoting a gradable property, the subject of comparison, and the standard against which it is contrasted; see the

English (17a) and synonymous Russian (17b) examples here. Two additional elements in these particular examples are: comparative morphology (either free or bound), glossed CMPR, expressing that the utterance is comparative, and a special marker of the standard of comparison, the particle *than* in English and the genitive case in Russian.

- |      |    |          |    |          |       |          |          |
|------|----|----------|----|----------|-------|----------|----------|
| (17) | a. | The bear | is | larg     | -er   | than     | the dog. |
|      |    | SUBJECT  |    | PROPERTY | CMPR  | STD. MKR | STANDARD |
|      | b. | medved'  |    | bol'sh   | -e    | sobak    | -i.      |
|      |    | bear     |    | big      | -CMPR | dog      | -GEN     |
|      |    | SUBJECT  |    | PROPERTY | CMPR  | STANDARD | STD. MKR |

Previous typological studies focus largely or exclusively on the broad syntax of these constructions, and/or on the morphology of standard marking (Andersen 1983, Stassen 1985, 2008). Only Ultan (1972) discusses the morphology of comparative marking, and his study does not focus on the contrasts that are of primary interest in the present work (although he remarks briefly on suppletive patterns, and notes the essential content of the CSG). In terms of coarse-grained morphosyntax, three broad types of comparative construction can be identified cross-linguistically (my classification is in part different from prior authors in ways that will become clear presently): the CONJOINED-comparative, the EXCEED-comparative, and the STANDARD comparative. All three are illustrated here, although most of this book will be concerned with the third type, and then, only with a subset thereof.

In the *conjoined*-comparative, illustrated in (18)-(20), a simple positive expression such as *The bear is large* is juxtaposed with a contrasting expression, for example, an antonymous predicate (as in (18)), with negation (as in (19)), or by the juxtaposition of a plain and intensified predicates (20).

- |      |  |              |                |          |              |
|------|--|--------------|----------------|----------|--------------|
| (18) | mosbi  | ó=le         | sum eka        | banimó   | ó-ta         |
|      | Port Moresby   | NEU-TOP      | big            | and      | Vanimó       |
|      |  |              |                | NEU-EMPH |              |
|      | gwăab=o=be   |              |                |          |              |
|      | small-PRD-DECL   |              |                |          |              |
|      | 'Port Moresby is bigger than Vanimo.' (Mian, Fedden 2007, 122)         |              |                |          |              |
| (19) | tinuʔn   | ʎeŋu-ʔn-č    | č'eβuzlaχ-aʔn, | a        | xaŋnaʔn qaʔm |
|      | these  | berry-PL-DIM | sweet-PL,      | but      | those not    |
|      | 'These berries are sweeter than those.' (Itelmen, field notes [SB14A]) |              |                |          |              |

- (20) poka fain maala, ne oko maala akena.  
 stilt this long ADD other long very  
 ‘This stilt is long but the other one is longer (lit: very long).’ (Mauwake, Berghäll 2010, 272)

According to Stassen (1985, 2008), roughly one language in five makes use of a conjoined comparative as the primary or exclusive means of expressing comparison (34/167 languages in Stassen (2008), and 35/143 in my broad sample).<sup>9</sup>

In the ‘exceed’ comparative type, a verb meaning ‘exceed’ or ‘surpass’ (either as the main predicate, or as a modifier) expresses the meaning of comparison. This type may be expressed by the loose English paraphrases *The bear is big, exceeding the dog* or *The bear exceeds the dog in tallness (height)*. Exceed comparatives are particularly common among (though not limited to) languages with serial verb constructions, and are widespread in Sub-Saharan Africa and Southeast Asia. Examples illustrating variants of this type are given in (21)-(22).<sup>10</sup>

- (21) Uqa cecela. Uqa ija wol-te-na.  
 3SG long 3SG 1SG surpass-1SG-3SG-PRES  
 ‘He is taller than me.’ (Amele, Roberts 1987, 91)

- (22) tā bi nī gāo  
 he EXCEED you tall  
 ‘He is taller than you’ (Mandarin, Li and Thompson 1981, 564)

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<sup>9</sup>The conjoined comparative strategy may be endangered. Of the 109 languages in Stassen (1985), 42 are spoken by more than 1 million people according to the figures in Gordon (2005). Taking population to be a rough proxy for endangered status, we might consider these 42 to be relatively safe. In the 109-language sample, 20 (18%) are conjoined-comparative languages, but only one of these (Nahuatl, with 1.4 million speakers) is among the 42 relatively large languages. The relative proportion of the other comparative types with standard comparatives outnumbering exceed comparatives by roughly  $3\frac{1}{2}:1$ .

<sup>10</sup>For some languages, there is somewhat of a fuzzy boundary between ‘exceed’-type comparatives and ‘standard’-comparatives. In Mandarin and Thai, for example, the element that marks comparison is historically derived from a verb meaning ‘exceed, surpass’ but is no longer obviously a verb synchronically, and may instead be analyzed as a standard marker. Deciding the issue one way or the other for these languages does not affect the points of interest in this book.

- (23) Ø-jäer-\a-hi                      t-à-yøtte  
 3M.SG.S-surpass-\O-1SG FEM-SG-intelligence  
 ‘He is smarter than I’ lit: ‘He surpasses me in smartness.’ (Tamashek, Heath 2005, 244)

On the whole, this type is roughly as common as the conjoined type, comprising 33/167 languages in Stassen (2008) and 38/143 languages in my broad sample.

The remainder (better than half) of the world’s languages make use of some version of the ‘standard’ construction. In this construction, comparison is (superficially at least) monoclausal, with a special marker for the standard of comparison, often a locative case-marking (or adposition), or sometimes another element specific to comparatives, such as the English particle *than*. In English and Russian (exemplified above), the standard is marked and there is also analytic or synthetic marking of the property-denoting predicate. Marking of the predicate is often optional, as in Modern Hebrew (24), and in fact the most common strategy cross-linguistically has no (obligatory) marking of the predicate, with overt comparative morphosyntax thus marked only on the standard, as in the Japanese example in (25) and many other languages.<sup>11</sup>

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<sup>11</sup>An apparent additional type (not generally noted in the previous literature) is represented in my sample in the (distantly related) Formosan languages Amis and Rukai, and possibly in Purepecha (Tarascan), an isolate in Mexico.

In Amis and Rukai, there is no distinct adjectival category; property-denoting predicates are verbal. In both languages one way of expressing comparison is to express the standard of comparison as the direct object of the property denoting-predicate, with partial reduplication in the verb in Rukai (Zeitoun 2007, 182), but no further marking in Amis, illustrated here.

- (i) maʃuəʃu-(aj) kuni a        wawa  
 fat-PROG    this (GEN) kid  
 ‘This kid is fat.’
- (ii) taʔaŋajaj ku    waʃu tu    puʃi  
 big                SUBJ dog    OBJ cat  
 ‘The dog is bigger than the cat.’ (He et al. 1986a, 61-63)

I suspect this is best seen as a special case of standard-marking where there is no morphological distinction between direct objects (patients) and (certain) obliques, a property shared with other Formosan languages. In Paiwan, the standard in a comparative construction is marked by the particle *tua/tjai* which also marks direct objects, but which is described as a sort of elsewhere marker for phrases in a variety of syntactic functions (Egli

- (24) Dan gavoha (yoter) mi-meri  
 D. tall MORE FROM-Mary  
 ‘Dan is taller than Mary.’
- (25) Sally-wa Bill-yori kasikoi  
 Sally-TOP Bill-FROM smart  
 ‘Sally is smarter than Bill.’ (Beck et al. 2004, 327)

Whether languages of the Japanese type have a null comparative element is a significant issue in the semantics literature (see Beck et al. 2004, 2009, Kennedy 2007a, Oda 2008, Hayashishita 2009, among many others, and I take up some discussion of this in light of Armenian in section 3.4.1).

In the most comprehensive typology work on comparison to date, Stassen (1985, 2008), the morphological marking of the predicate is not considered. Stassen’s typology focusses instead on the nature of the marking of the standard. For example, Stassen draws a distinction between case-marked standards, and particle-marked standards, such as English *than*, as different major types of comparative construction. However, this distinction appears to cross-classify with the type of morphological marking of the predicate of interest here, and I have thus not followed this classification. All of the languages in Appendix A and Appendix B, constituting the main data set for the study of the CSG in particular, are drawn from the standard type, for the reason that these were the only language type to exemplify the phenomena of interest. By way of elaboration on that last observation, a few points of general interest arise, which I mention briefly here.

For the conjoined and exceed-type comparatives, it is a matter of debate whether expressions of this sort should be considered to constitute a grammatical(-ized) comparative in any meaningful sense (Sapir 1944, Ultan 1972, Seuren 1984, Steele 1987). Is their interpretation simply the sum of

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1990, 189-199). chuen Kuo (2008) shows that Amis has a variety of means for expressing comparison, including conjoined comparatives, exceed constructions (with main predicate ‘more’, as in other Austronesian languages) and standard-lik constructions with oblique marking of the standard NP; one of these constructions involves a prefix on the predicate. (I thank I.-T. C. Hsieh for providing English translations of examples in He et al. 1986a.)

In Purepecha (Tarascan), as described in (Foster 1969, 126-128) a transitivizing morpheme *-ku-* (which has a variety of functions) may be added to a verbalized adjective to yield a comparative, with the standard expressed as a the direct object. This construction is somehow ephemeral—older descriptions (de S. Juan Crisóstomo Nájera 1879, Swadesh 1969) give an exceed comparative, while a more recent description (Chamoreau 2003) shows a periphrastic construction with the borrowed Spanish adverb *mas*.

their (overt) parts, or do they involve any hidden grammatical comparative element? Only recently has the semantics of these constructions come under scrutiny (see Beck et al. 2009, Kennedy Forthcoming), with no conclusive evidence of any hidden elements of comparative pieces, over and above what translation equivalents in languages like English have. Regarding conjoined comparatives, it may be noted that the languages of this type investigated for the current study also typically lacked any clear overt comparative marker as an obligatory component of these constructions. For a few such languages, an element glossed ‘more’ or ‘comparative’ is given in examples — six of the 20 conjoined comparative languages in Stassen (1985) (namely Maori, Menomini, Miskitu, Motu, Nahuatl, Samoan) have such elements in the glosses, but as far as I have been able to determine from the grammatical descriptions, these elements are general-purpose intensifiers, rather than comparative adverbs. For example, Stassen (1985) provides the Miskitu example in (26a) with an element glossed as a comparative marker, based on the description of this element in (Conzemius 1929, 80): “The adjective is compared by placing before it the words *kau*, *kāra*, *kanra*, or *kanmapa* ... ‘more’ for the comparative...”. Yet elsewhere, (Conzemius 1929, 106-109) discusses the same elements that occur in comparatives (in Miskitu, and in the other Chibchan languages) as having a broader range of intensifying meanings, for example, glossed as ‘still’ in (26b), where a comparative sense is clearly precluded by the context. Examples in other languages tend to be of a similar nature.<sup>12</sup>

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<sup>12</sup>But note the brief discussion of comparison in the Hokan language Kiliwa in Mixco (2000, 41-42). This language appears to use conjoined clauses, with loose literal paraphrases such as ‘he’s not like me; he’s tall-er’; though there is no discussion of whether the affix glossed MORE can be used outside of this construction. Another relevant example may be Dyrbal. Dixon (1972) give a comparative affix *-baɾa*, used in examples lacking an overt standard, such as (i). (Dixon 1972, 227) notes that when “an explicit comparison is needed”, a conjoined construction is used, as in (ii)-(iii), which may contain the comparative on one or both clauses.

- (i) *ɲinda midi-baɾa*  
you small-CMPR  
‘You are smaller.’
- (ii) *ɲaɖa bulgan-baɾa bayi midi-baɾa*  
I big-CMPR he small-CMPR  
‘I’m bigger [than him]; he’s smaller [than me]’
- (iii) *bayi bulgan ɲaɖa bulgan-baɾa*  
he big I big-CMPR



- b. Ibu moo                    gën      a    nay            Faatu  
 Ibu 3S.SUBJ.FOCUS surpass LV be.miserly Faatu  
 ‘Ibu is more miserly than Faatu.’
- c. Faatu dafa                    njool  
 Faatu 3S.V FOCUS be.tall  
 ‘Faatu is tall.’
- d. Faatu dafa                    sut                    Ibu  
 Faatu 3S.V FOCUS be.taller.than Ibu  
 ‘Faatu is taller than Ibu.’
- e. Moo                    gën-a            njool    Aamadu  
 3S.SUBJ.FOCUS surpass-LV be.tall Amadou  
 ‘He’s taller than Amadou.’

Similarly, in the unrelated Berber language Tamashek, the verb *-ujvr-* ‘surpass’ is used (with a nominalization of the property predicate) to form comparatives and superlatives (see (23), but there are also verbs with intrinsically comparative meaning, including at least *-ufv-* ‘be better than’ (Heath 2005, 245).<sup>14</sup> As far as I can determine, these languages do not have a distinct superlative construction for which the CSG would make predictions, and since the languages do not draw a distinction between adjectives and verbs, discussion of the CΔG is moot. The apparent suppletion is noted here, but not explored any further.

Returning to the standard comparative languages, and in particular those with morphological marking, by way of a passing etymological observation, it is perhaps worthy of note that there appears to be a recurring source for comparative affixes, namely, in morphemes with a meaning like ‘rather’, ‘more or less’, or ‘in contrast to others.’ (Benveniste 1948, 124-126) suggests that the original meaning of the Proto-Indo-European *\*-ios* was to defuse the force of the positive. Across Turkic the suffix *-rak* (in its many surface forms) forms variously comparatives, as in Karaim (Musaev 1966, 267) and Uzbek (Reshetov 1966, 346), or diminutives (cf. English *-ish*, Russian *-ovat-*), as in Khakass (Karpov 1966, 434) or Nogaj (Baskakov 1966, 284). Similarly, the reflexes of Finno-Ugric *\*-mp* are comparative affixes in some languages (Finnish, Hungarian), but have meanings like ‘rather’ in others (Nenets); see Fuchs (1949). Among adverbs as well, in Lahu, the adverb *a-ci* has the basic

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<sup>14</sup>Intrinsically comparative verbs for some adjectival meanings are also reported for Mayali (Evans 2003, 569-570).

meaning ‘a little, somewhat’, but when used with a property-denoting stative verb, serves to form the comparative (Matisoff 1973, 273-274). An exception to this pattern is Chukchi, where the comparative affix appears to be an oblique case marker (see Skorik 1977, 334).

This completes the review of some theoretical, methodological and typological background that informs the remainder of this book. On now, to the phenomena of interest.

# Chapter 2

## Comparative Suppletion

### 2.1 Introduction

In many languages, a handful of adjectives form their comparative grade via a root (or base) that is etymologically unrelated to the positive root. It is for this phenomenon that the term ‘suppletive’ (German: *suppletorisch*) was originally coined in Osthoff (1888, 1899). A sample of examples is given in (28), with roots boldfaced:<sup>1</sup>

(28)		POS	CMPR	
a. English:	<b>good</b>	<b>bett-er</b>		
b. Latin:	<b>bon-us</b>	<b>mel-ior</b>		‘good’
c. Icelandic:	<b>gamall</b>	<b>eld-ri</b>		‘old’
d. Georgian:	<b>k’argi-i</b>	<b>u-mjɔb-es-i</b>		‘good’
e. Upper Svan:	<b>žɣəd</b>	<b>xo-š-a</b>		‘big’
f. Abkhaz:	<b>a-c<sup>w</sup>g<sup>j</sup>a</b>	<b>j-ejc<sup>w</sup>o-w</b>		‘bad’
g. Basque:	<b>on</b>	<b>hobe</b>		‘good’
h. Estonian:	<b>hea</b>	<b>pare-m</b>		‘good’

In most such examples, the suppletive comparatives have regular comparative morphology but the root is not supplied by or phonologically derived from the positive base. Pairs of suppletive and non-suppletive comparatives

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<sup>1</sup>For familiarity, examples will generally be given in the standard orthography or standard transliteration of the languages in question, and in citation forms wherever practical. Thus, even though our interest is in the roots or stems and the comparative and superlative morphology, many examples will contain additional (irrelevant) inflectional material, such as the masculine, nominative, singular ending *-us* in Latin (28b) and elsewhere.

in (29) illustrate this. (In a small minority of examples, such as English *bad* – *worse*, and the Basque example in (28g), the comparative morpheme is missing, a situation which we return to in section 2.2 and ??.)

(29)		POS	CMPR	
	a. English:	<b>good</b>	<b>bett-er</b>	
		<b>long</b>	<b>long-er</b>	
	b. Latin:	<b>bon-us</b>	<b>mel-ior</b>	‘good’
		<b>dur-us</b>	<b>dur-ior</b>	‘hard’
	c. Icelandic:	<b>gamall</b>	<b>eld-ri</b>	‘old’
		<b>stór</b>	<b>stær-ri</b>	‘strong’
	d. Basque:	<b>asko</b>	<b>gehi-ago</b>	‘most’
		<b>zoro</b>	<b>zoro-ago</b>	‘crazy’
	e. Votic	<b>üvä</b>	<b>parə-pi</b>	‘good’
		<b>süvä</b>	<b>süve-pi</b>	‘deep’

Adjectives in some languages also have a superlative grade, with the meaning “more ADJ than all others.” Throughout this work, unless otherwise noted, I will restrict the term *superlative* to the sense of relative superlatives, excluding forms that are sometimes called “absolute” superlatives. The latter do not have a strictly comparative sense, and mean instead “ADJ to a very high or excessive degree”. Examples of affixes that form absolute superlatives include the Modern Romance *-issim-o* suffix (as in Italian *bell-issim-a* ‘very beautiful’ < *bell-* ‘beautiful’), the Slavic prefix *pre-* (as Slovenian *pre-lép* ‘too/very beautiful’ < *lép* ‘beautiful’), the suffix *-ejš-ij* in Russian (as in *vern-ejš-ij drug* ‘very/most loyal friend’ < *vern-yj drug* ‘loyal friend’), and Modern Greek *-tatos*). These do not fall within the scope of the generalizations below.<sup>2</sup>

Suppletion also extends to the superlative grade. In the majority of cases, the superlative and comparative share a common root, distinct from that of the positive (Ullmann 1972, 144), as in (30). I will refer to this as an ABB pattern, to indicate that the shared root (B) in the comparative and superlative is distinct from that of the positive (A).

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<sup>2</sup>Not all languages draw a clear distinction between the two types of superlative, and grammatical descriptions are sometimes vague on this point. As a rule of thumb, I have tried to note all questionable cases below wherever an analytical decision bears on the status of the empirical generalizations under discussion.

(30)		POS	CMPR	SPRL	
	a. English:	<b>good</b>	<b>bett-er</b>	<b>be-st</b>	
	b. English:	<b>bad</b>	<b>worse</b>	<b>wor-st</b>	
	c. Danish:	<b>god</b>	<b>bed-re</b>	<b>bed-st</b>	‘good’
	d. Czech :	<b>špatn-ý</b>	<b>hor-ší</b>	nej- <b>hor-ší</b>	‘bad’
	e. Georgian:	<b>k’argi-i</b>	u- <b>mĵob-es-i</b>	sa-u- <b>mĵob-es-o</b>	‘good’
	f. Estonian:	<b>hea</b>	<b>pare-m</b>	<b>par-im</b>	‘good’
	g. Kildin Saami:	<b>šig’</b>	<b>pær’-am</b>	<b>pær’-mus</b>	‘good’
	h. Basque:	<b>asko</b>	<b>gehi-ago</b>	<b>gehi-en</b>	‘many’
	i. Kabardian:	<b>kwad, ba</b>	<b>nax</b>	<b>nax-deda</b>	‘many’

Another suppletive pattern that is rare, but nevertheless attested, is the ABC pattern, in which each grade is built on a distinct root. The Latin and Welsh triples meaning ‘good – better – best’ constitute ABC patterns, as shown in (31):

(31)		POS	CMPR	SPRL	
	a. Latin:	<b>bon-us</b>	<b>mel-ior</b>	<b>opt-imus</b>	‘good’
	b. Welsh:	<b>da</b>	<b>gwell</b>	<b>gor-au</b>	‘good’

I will argue below that ABB and ABC are the only attested suppletive patterns, and that a handful of apparently divergent patterns should be re-analyzed. The state of affairs regarding comparative suppletion may then be schematized as in (32). Of five logically possible patterns of root identity and suppletion, only three are attested.

(32)		POS	CMPR	SPRL	
	a. regular	A	A	A	<i>big – bigger – biggest</i>
	b. suppletive	A	B	B	<i>good – better – best</i>
	c. doubly-suppletive	A	B	C	<i>bonus – melior – optimus</i>
	d. unattested	A	B	A	<i>*good – better – goodest</i>
	e. unattested	A	A	B	<i>*good – gooder – best</i>

This patterning was noted briefly in the closing paragraphs of the only previous study of the morphology of comparison (Ultan 1972). For a 20-language sample, Ultan notes that “suppletive paradigms in the comparison of adjectives almost always imply formal identity or near-identity of the bases shared by the comparative and superlative vis-à-vis those shared by the positive and equative” (Ultan 1972, 144). Ultan’s generalization is robustly

supported in the larger survey reported here. Indeed, I submit that (a slight reformulation of) Ultan's generalization is a strong contender for the status of a linguistic universal.<sup>3</sup> For reasons that will become clear as we proceed, I suggest breaking the generalization into two pieces, to cover (32d) and (e) separately. We may thus formulate the two-part generalization in (33) and (34), referring to the whole generalization as the CSG:

- (33) The Comparative-Superlative Generalization, part I (CSG1):  
If the comparative degree of an adjective is suppletive, then the superlative is also suppletive (i.e., with respect to the positive).
- (34) The Comparative-Superlative Generalization, part II (CSG2):  
If the superlative degree of an adjective is suppletive, then the comparative is also suppletive (i.e., with respect to the positive).

The CSG (in both parts) ranges over synthetic, i.e., morphological, comparative and superlative grades. Analytic (periphrastic) constructions show different behavior (I return in the next chapter, section 3.4, to why this is so). The immediate goal of this chapter is to propose an explanation of this apparent universal and to consider some consequences of that explanation. The explanation I offer has two key components (both qualified below). First, the representation of the superlative must properly contain (be derived from) that of the comparative. Second, suppletion constitutes a special case of rules of exponence (also called vocabulary insertion), introducing distinct root formatives into specific contexts. Such rules are most properly formulated in terms of a *realizational* theory of morphology (in the sense of Stump 2001), in which morphological rules spell out a derivationally prior complex (i.e., syntactic) structure. Part 1 of the CSG in (33) follows essentially from these two assumptions. An additional assumption, that there is an adjacency condition on context-sensitive rules of exponence, extends the theory to account for the CSG2.

The remainder of this chapter is organized as follows. First, I will sketch the bare bones of the analysis, presenting the leading ideas, but leaving details and motivation of assumptions aside. I then turn to a type of poverty-of-the-stimulus argument that this data raises. The key generalizations concern

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<sup>3</sup>Ultan suggested that the generalization represented a strong tendency and not an absolute. In part, this is because the ABC pattern is a violation of the pattern he saw, which recognizes only the ABB pattern, in contrast to the CSG below, which also admits ABC. In addition, Ultan believed ABA patterns to occur, however, the one apparent ABA pattern he noted seems to be misanalyzed (see n.19 below.)

gaps, and since suppletion is such a marginal phenomenon in any one language, there is no way in which the data available to any given learner could be robust enough to distinguish accidental from systematic gaps in their language. I elaborate on this argument for the hand of Universal Grammar, arguing against an appeal to historical accident, in section 2.3. Once the reader can see where we are headed, I turn in Chapter 3 to a discussion of independent evidence for one key assumption, and then a prevent a refinement of some details of the theory, necessitating many asides (some of which reveal fruitful additional generalizations).

In Chapter 4 I will lay out in more detail the results of a cross-linguistic investigation of (33). In a relatively comprehensive survey of the comparative suppletion encompassing more than a hundred distinct examples (there are some tricky issues in counting, discussed below), there are but a handful of *prima facie* counter-examples, for which alternative analyses are proposed in section 4.1 and 4.3. If the apparent counter-examples can indeed be explained away, as I suggest, then the ABB and ABC patterns are indeed the only attested patterns — no adjective shows an unambiguous ABA pattern, i.e., hypothetical *\*good – better – goodest* or *\*bonus – melior – bonissimus* in which the comparative alone is suppletive, with the positive and superlative sharing a common root.

## 2.2 \*ABA - Explaining a gap

The account of the CSG begins by assuming that the representation of the superlative properly contains that of the comparative in all languages. I call this the *Containment Hypothesis*. Note that this embedding is transparent in the overt morphology in many languages, as in the Czech and Georgian examples in (30), and in the non-suppletive examples in (35):

(35)		POS	CMPR	SPRL	
	a. Persian:	<b>kam</b>	<b>kam</b> -tar	<b>kam</b> -tar-in	‘little’
	b. Cimbrian:	<b>šüa</b>	<b>šüan</b> -ar	<b>šüan</b> -ar-ste	‘pretty’
	c. Czech:	<b>mlad</b> -ý	<b>mlad</b> -ší	nej- <b>mlad</b> -ší	‘young’
	d. Hungarian:	<b>nagy</b>	<b>nagy</b> -obb	leg- <b>nagy</b> -obb	‘big’
	e. Latvian:	<b>zil</b> -ais	<b>zil</b> -âk-ais	vis- <b>zil</b> -âk-ais	‘blue’
	f. Ubykh:	<b>nüs</b> °ə	ç’a- <b>nüs</b> °ə	a-ç’a- <b>nüs</b> °ə	‘pretty’

Further evidence for the Containment Hypothesis (and some qualifications) will be provided in the next chapter. The most straightforward (but not the only) means of representing containment is via a nested structure, in which the superlative is derived from the comparative by the addition of some morpheme. Thus we have the *Nesting Hypothesis* in (36a) as a special case of the Containment Hypothesis.<sup>4</sup> Under certain assumptions, this can be seen as a cashing out of the markedness hierarchy positive < comparative < superlative proposed in Greenberg (1966), Canger (1966), Ultan (1972), a topic to which we return.<sup>5</sup> On the Nesting Hypothesis, despite appearances, the representation in (36b) is thus incorrect for languages like English; there must be a “hidden” comparative element even in forms such as *biggest*.<sup>6</sup>

- (36) a. [ [ [ ADJECTIVE ] COMPARATIVE ] SUPERLATIVE ]  
 b. \* [ [ ADJECTIVE ] SUPERLATIVE ]

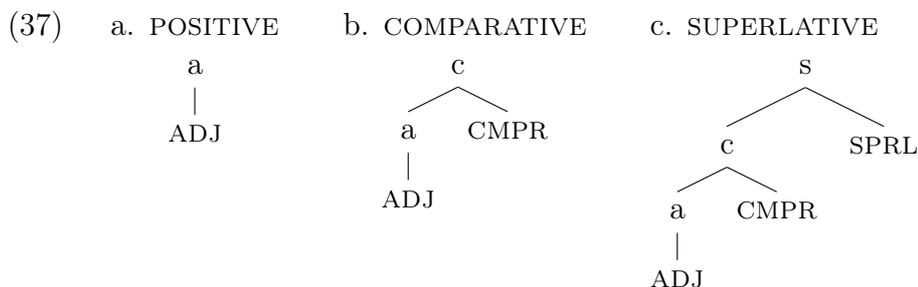
The structure in (36a) can of course be represented as a tree diagram, as in (37). I use the convention of ALLCAPS to represent the abstract morphemes, and put aside the questions of the proper labels for non-terminal nodes. Thus *a*, *c*, *s* are simply mnemonics to refer to specific nodes in the diagrammes. Also, as in (36a), I represent this as a suffixing structure, though what is of interest is the hierarchical (constituency), not linear relations (for example, the superlative exponent is a prefix in Czech).

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<sup>4</sup>Here and throughout, diagrams represent stems to which inflectional morphology may be added. The comparative embeds the positive stem (or base), minus inflectional morphology.

<sup>5</sup>The Nesting Hypothesis is also reminiscent of proposals for an implicational hierarchy among a series of functional heads in particular domains, where the inventory of functional heads is subject to cross-linguistics variation, but the presence of a higher head entails the presence of lower heads. See Wurmbrand (2006, 2008) for a proposal regarding variation in the structure of infinitival complements, and Radkevich (2010) on PP structure.

<sup>6</sup>Note also that I must reject a POS morpheme in the positive, a morpheme that, although not clearly manifest in overt morphology in any known language, is an important component of some semantic treatments; see Kennedy 2007b. I return to this question in section 4.2, below.



Consider now the nature of the rules of exponence that will insert phonological material at the nodes in (37). The first case to consider is Czech, a language in which the nesting structure in (37) is morphologically transparent, as noted in descriptive grammars of the language (e.g., Janda and Townsend 2000). The relevant forms of two Czech adjectives are given in (38).

(38)

	POS	CMPR	SPRL
a. 'young':	<b>mlad-ý</b>	<b>mlad-ší</b>	nej- <b>mlad-ší</b>
b. 'bad':	<b>špatn-ý</b>	<b>hor-ší</b>	nej- <b>hor-ší</b>

A fragment of the Czech rules of exponence (the Vocabulary) is given in (39).<sup>7</sup>

(39)

a.	SPRL	→	nej-
b.	CMPR	→	-ší
c.	YOUNG	→	mlad-
d.	BAD	→	hor- / ___ ] CMPR
e.	BAD	→	špatn-

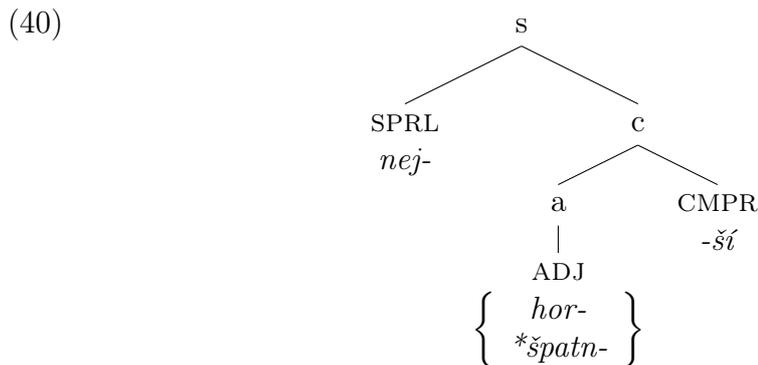
The rules in (39a-c) account for the three forms of the regular adjective *mlad-ý* (additional rules insert inflectional exponents, including the masculine, singular, nominative *-ý* in the citation form). The exponents simply realize the corresponding terminal nodes in the structures in (37).

Where a regular adjectival root such as *mlad-* 'young' has only a single form, suppletive roots have, by definition, multiple allomorphs. The Czech

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<sup>7</sup>Here and below, the rule fragments presented are only those required for the point under discussion. The Czech vocabulary includes additional rules introducing other allomorphs of the comparative suffix, notably *-ější/-ejší*, along with contextual restrictions regulating their distribution, and the same holds for comparative and superlative exponents in other languages below. These complexities do not affect the structure of the argument and are left aside for ease of exposition.

root meaning ‘bad’ has two: one (*hor-*) introduced by the context-sensitive rule in (39d), and the other (*špatn-*) introduced by the context-free rule in (39e). The logic of elsewhere ordering ensures that the more specific allomorph is chosen whenever possible. Thus, both allomorphs compete for insertion in the comparative structure in (37b), and the allomorph *hor-*, being the most specific form available, wins. In the positive structure (37a), the environment for *hor-* is not met, and thus the elsewhere allomorph *špatn-* wins by default. Now notice what happens in the superlative. By assumption, the representation of the superlative (properly) includes that of the comparative. Therefore, the context for the “comparative” allomorph *hor-* is met, and that allomorph is selected. The rules in (39a-b) operate as before, supplying exponents to the comparative and superlative nodes. The superlative, with the proper exponents, is shown in (40):



This constitutes the first key result: the combination of assuming a nested structure and applying the elsewhere logic to root allomorph selections yields an ABB pattern as an automatic consequence whenever an adjective has a suppletive comparative and nothing further is said. Because the comparative is contained in the superlative, the comparative allomorph (of an adjectival root) will automatically be compatible with the superlative context as well, and will necessarily block the positive (default) allomorph of that root. Thus the ABA pattern (a return to the positive root in the superlative) is effectively excluded, yielding the core content of part 1 of the CSG.

Now, although the logic just sketched correctly excludes ABA patterns, it nevertheless does allow for patterns beyond ABB. In particular, the ABC pattern is readily describable. The comparative root allomorph will necessarily block the positive in the superlative context, but the comparative allomorph can in turn be blocked by an even more highly specific exponent,

as in the allomorphs of the Latin root for ‘good.’ The Vocabulary fragment in (41) provides the rules of exponence that will derive the ABC pattern for this adjective (in Chapter 5, I will revise the somewhat clunky formalism for the superlative context in (41a)):

- (41) Latin
- |    |      |   |       |   |       |        |        |
|----|------|---|-------|---|-------|--------|--------|
| a. | GOOD | → | opt-  | / | ___ ] | CMPR ] | SPRL ] |
| b. | GOOD | → | mel-  | / | ___ ] | CMPR ] |        |
| c. | GOOD | → | bon-  |   |       |        |        |
| d. | SPRL | → | -imus |   |       |        |        |
| e. | CMPR | → | -ior  |   |       |        |        |

As it happens, one additional clean up is needed for the Latin examples. The rules in (41) provide the correct root allomorph in each context, but will generate an overt comparative suffix inside the superlative. While this was correct for Czech (and many other languages, see Chapter 3), the rules as stated will incorrectly give *\*opt-ior-imus* in place of *opt-imus* for Latin. To derive the surface forms in which the comparative marker is not visible in the superlative, I posit that the comparative morpheme has a phonologically null allomorph that occurs in the context of the superlative, as in (42). The standard elsewhere logic will ensure that the null allomorph wins out over the regular comparative (43b) in the superlative, just as it selects the correct root exponents in the suppletive cases so far examined.

- (42) CMPR → ∅ / \_\_\_ ] SPRL ]

The revision to the context for (41a) to be offered in Chapter 5 will in fact avoid the need for (42) for the Latin examples just given, but the issue is a more general one, and a null allomorph has broader application. For example, adding (42) to the English rules of exponence in (43) will correctly generate *bigg-er*, as opposed to *\*bigg-er-est*.

- (43)
- |    |      |   |      |
|----|------|---|------|
| a. | BIG  | → | big  |
| b. | CMPR | → | -er  |
| c. | SPRL | → | -est |

With no further assumptions, the CSG1 is now essentially derived from the Containment Hypothesis and the assumption that rules of exponence are subject to Elsewhere ordering: the ABA pattern is unstatable, except as an instance of accidental homophony. If there are only two distinct listed root

forms in a language’s vocabulary, no ordering of the rules introducing these roots will lead to an ABA pattern.<sup>8</sup> But the attested patterns, ABB and ABC are readily derived, with ABB in some sense being the unmarked case of comparative suppletion, as against the ABC pattern, which requires an additional rule.

Now, various authors across a variety of frameworks have argued for an adjacency (or contiguity) condition on allomorphy, such that the trigger for suppletive allomorphy must be adjacent to the root that undergoes allomorphy (see Siegel 1978, Allen 1979, Embick 2003, 2010; see Hay 2000 for a brief review of the earlier proposals). Adopting this assumption will serve to extend the account above to the second part of the CSG, excluding the unattested \*AAB pattern \**good – gooder – best*, as in (32e). Under the Containment (specifically, the Nesting) Hypothesis, an attempt to derive an AAB pattern via the vocabulary items in (44) will fail, as the context in (44a) falls afoul of the adjacency condition.

- (44) a. GOOD → be(tt)- / \_\_\_ ] SPRL ]  
 b. GOOD → good

Of course, care must be taken in formalizing this such that whatever device is used to condition the superlative root allomorph in the ABC cases (see (41a)) must be unavailable for putative, but unattested, \*AAB cases in (44). I postpone further discussion of this point until section 5.3, concentrating on

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<sup>8</sup>It is possible to generate something that has a superficial resemblance to an ABA pattern, but only by positing three root allomorphs, two of which are homophonous, for example, by having (41a) introduce the same phonological matrix as (41c), sandwiching the comparative allomorph between them. This is still formally an ABC pattern, with A and C as separate vocabulary items, which happen to have the same phonological matrix. I suggest that grammar, and hence children in the course of acquisition, avoid positing a contextually restricted allomorph of a single morpheme that is homophonous with the default/elsewhere case. The claim here is perhaps sharper if one thinks of the rules of exponence as overwriting or rewriting rules. In essence, I claim there are no rules of exponence of the form  $X \rightarrow X$ , which effect no change but serve only to block some more general rule. Irregular forms that appear to have no change from the base, such as the English irregular plural *sheep* (singular *sheep*) or past tense *hit* must thus involve a zero affix (contrast Anderson 1992). I return to this point in section 4.2 and chapter 3. It is possible to consider the accidental homophony strategy as a retreat of last resort, with perhaps the implication that the CSG should emerge as a trend, rather than an absolute (compare Pertsova 2007). I will pursue the stronger claim that this is never allowed, and that apparent ABA patterns must find an alternative explanation.

the \*ABA cases until then.<sup>9</sup>

Consider now what happens if the Nesting (or Containment) Hypothesis were not adopted. Standard descriptions of English (including the majority of formal treatments of the superlative, such as Szabolcsi 1986, Heim 2000, Hackl 2009) posit two morphemes, the comparative and the superlative, both of which attach to the adjective directly, as in (45).

- (45) a. [ [ ADJECTIVE ] COMPARATIVE/-ER ]  
 b. [ [ ADJECTIVE ] SUPERLATIVE/-EST ]

A variation of this description posits a single *degree* head (DEG) as in (46), of which both the comparative and superlative are possible values.

- (46) [ [ ADJECTIVE ] DEGREE ]

Theories starting from these assumptions will be able to describe the attested patterns of root suppletion (although something additional needs to be said in order to insert both comparative and superlative morphology in languages with overt nesting, like Czech). Under (46), the ABB pattern among the roots in Czech could be described as in (47) (compare to (39) above), by making the degree head (common to both comparative and superlative) the context for the allomorphy.

- (47) a. BAD → hor- / \_\_\_ ] DEG  
 b. BAD → špatn-

Although reference to DEG may look like a convenient means of representing the ABB patterns, it appears to fail for languages that have more degree affixes than just comparative and superlative.<sup>10</sup> Ultan (1972) noted that the common pattern of shared suppletive roots groups comparative and superlative together, to the exclusion of the equative degree, even where this can be affixal, as in Welsh (48).

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<sup>9</sup>Note further that the rule introducing the zero comparative in (42) is formulated as a rule of exponence. On the assumption that vocabulary insertion proceeds cyclically from the root outwards, (42) thus automatically follows vocabulary insertion at the root. Rule (42) must be prevented from deleting or pruning the comparative node prior to root insertion, else it would render the root and the superlative adjacent, incorrectly feeding rules like (44a) and bleeding those like (39d). The approach to impoverishment in Trommer (1999) treats all impoverishment rules as special cases of zero-vocabulary insertion, which would ensure the correct ordering in the cases at hand. See also Embick (2010) for discussion of pruning and adjacency.

<sup>10</sup>My thanks to Jessica Rett for this observation.

(48)	POS	CMPR	SPRL	EQUATIVE	
	<b>drwg</b>	<b>gwaeth</b>	<b>gwaeth-a</b>	cyn- <b>ddrwg</b>	‘bad’

The same point can be made with reference to the intensified or absolute superlative degree, marked by the prefix *pře-* in Czech (as in (49a-b)), or other intensifiers in the language, such as the suffix *-ink-* (49c). In both these cases, positing a suppletive allomorph in the context  $\_\_ \mid \text{DEGREE} \mid$  would incorrectly overgeneralize that allomorph to the equative and intensified or absolute superlative forms, respectively.<sup>11</sup>

(49)	POS	CMPR	SPRL	A.SPRL/INTNS	
	a. <b>dobr-ý</b>	<b>lep-ší</b>	nej- <b>lep-ší</b>	pře- <b>dobr-ý</b>	‘good’
	b. <b>špatn-ý</b>	<b>hor-ší</b>	nej- <b>hor-ší</b>	pře- <b>špatn-ý</b>	‘bad’
	c. <b>mal-ý</b>	<b>men-ší</b>	nej- <b>men-ší</b>	<b>mal-ink-ý</b>	‘small’

Even if we restrict the discussion to languages without these extra degrees, the ABC patterns establish that reference to degree alone is insufficient, and that statements of contextual allomorphy must be able to distinguish between comparative and superlative. Thus, under (45) or (46), Latin would require a treatment as in (50).

(50)	a. GOOD	→	opt-	/	$\_\_ \mid$	SPRL	
	b. GOOD	→	mel-	/	$\_\_ \mid$	CMPR	]
	c. GOOD	→	bon-				

And therein lies the rub. Consider a pattern exactly like Latin, but without the rule in (50a). In a theory with the Containment Hypothesis, elsewhere ordering ensures that the allomorph in (50b) will automatically extend to the superlative environment, yielding the ABB pattern. But in a theory lacking the Containment Hypothesis, no such extension is guaranteed.

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<sup>11</sup>I thank Ivona Kučerová and Pavel Caha (personal communication 2010) for discussion of the Czech forms. Both note that *pře-dobr-ý* is somewhat stilted or ‘bookish’, but is clearly the form that fills the slot indicated in (49a), as opposed to a form built on the root *lep-*.

The point here is that suppletion in the comparative automatically extends to the superlative, unless there is further suppletion (an ABC pattern), but the suppletion in the comparative does not automatically extend to the equative. Nothing prevents the comparative allomorph being specified to occur in the equative context as well. Thus, Welsh *bach* ‘small’ has suppletive allomorph *llai* ‘smaller’, which occurs also in both the superlative and equative; Welsh *da* ‘good’ has four distinct roots, one for each grade (including the positive).

The comparative environment is just that — the comparative — and the basic pattern is thus the unattested \*ABA (*\*bonus – melior – bonissimus*). Put differently, without the Containment Hypothesis, nothing precludes direct reference to the comparative context alone, and it is this possibility which prevents the theory from deriving (hence explaining) the CSG. At the risk of redundancy: the argument here is not that the theories differ in their abilities to describe the attested patterns; what is at stake is whether the unattested \*ABA pattern is excluded by the theory for principled reasons.

This concludes the presentation of the core analysis. There are numerous refinements and clarifications to be presented, and it is these, as well as more careful discussion of the empirical basis for the claims, and apparent counter-examples, that will occupy the next chapters. One obvious question is why the Containment Hypothesis would hold, and relatedly, how it might be formally cast within UG. I will postpone discussion of this until Chapter 7, offering only a rather incomplete speculation even there. As noted in the introduction, the suggestion I will make in that chapter is that UG imposes limits on the complexity of functional morphemes — the combination of pieces needed to compose a superlative (namely, the comparative and something yielding “than all (others)”) is simply too big to fit into a single functional head. The Containment Hypothesis is thus not formally a part of UG, but rather a corollary of the complexity of its meaning. Before addressing the details of the morphological theory, and the empirical minutiae, I wish to step back to consider (and reject) an alternative approach to the CSG which would treat it as a historical accident, seeking an externalist explanation rather than the internalist mechanism of UG.

## 2.3 UG vs. the European Sprachbund

In the preceding section, I have sketched a preliminary account of the CSG. The account derives this generalization from the Containment Hypothesis and from the assumption that suppletion is to be modeled as contextual allomorphy, implemented by Rules of Exponence (Vocabulary Insertion), subject to elsewhere ordering. Arguments from gaps (of the sort characterized by the CSG) rest implicitly on the premise that the missing pattern is unlikely to be merely an accidental gap. This is essentially a statistical argument, even if it is not formalized as such, and this raises two points within the current context.

### 2.3.1 The insignificance of the evidence

The first point is a newish twist on the familiar poverty-of-the-stimulus type of argument for Universal Grammar. If the CSG is a valid generalization, as I contend here, then it is not something that can be learned from the data available to a normally developing child. Since suppletion is such a marginal phenomenon internal to any one language, with so few relevant forms (if any at all), the Primary Linguistic Data to which any one child is exposed is far too sparse to warrant any conclusions about impossible suppletive patterns. In other words, the absence of the ABA pattern in any given language is in and of itself insignificant. The generalization is only significant, and thus worthy of attention, in its cross-linguistic context.

This point can be appreciated with reference to English, which has a handful of suppletive comparatives (*better*, *worse*, *more*, *less*), all of which participate in ABB patterns. The ABA pattern is indeed absent from English, but with only four triples (two of which have further irregularities), it would seem rash to infer that this is a significant absence, indicative of a general property of UG. Indeed, the ABC pattern is just as absent from English as the ABA pattern is, yet it would be simply false to conclude that the ABC pattern is disallowed by UG, as it is indeed attested in other languages (Welsh and Latin examples were given above). Other languages show a similar situation, many with but a single element entering into suppletion (and the vast majority having of course none whatsoever).

The explanation of the contingent fact that Modern English *good* compares on an ABB pattern *good* – *better* – *best*, and not some other pattern, certainly lies squarely in the history of the language: this pattern is inherited from previous stages of English (ultimately from the earliest common Germanic ancestor). If the ancestor of modern English had had a different pattern (say along the lines of *good* – *better* – *finest*), then that pattern would presumably have been the one Modern English inherited. The existence of ABB and ABC patterns demonstrates that children are equipped to acquire those patterns on the basis of evidence in the input, and the account of what any one child acquires needs no appeal to UG beyond the general ability to learn these patterns from the input. Where UG is invoked instead is at the level of the broad, cross-linguistic generalization. UG explains (in the manner laid out in the previous section) why, from among the many suppletive patterns that have arisen in a variety of languages, no genuine ABA or AAB patterns are to be found. In an important sense, then, UG places bounds

on possible language change (cf. Kiparsky 2008): no language can undergo a change that yields a genuine ABA or AAB pattern, since no learner could posit a grammar that would accommodate such a pattern.

In sum, the logic here is that the CSG cannot be learned from the data. It must therefore either be spurious, holding true only accidentally (I argue against this Chapter 4, or it must be attributed to some more general constraint imposed on possible grammars that a learner may posit. In principle, this yields two options: either an inherent grammatical constraint (UG), or a language-external consideration, such as some general principle of cognition. So far as I can see, there are no current candidates for a general cognitive or functional principle that would exclude the ABA or AAB patterns. For example, the markedness hierarchy *positive* < *comparative* < *superlative* is discussed in the functionalist literature by Heine (1997, 124-126), yet rather than providing independent evidence for some language-external consideration that will derive the hierarchy, Heine approaches the matter from the other direction, arguing that the evidence for this hierarchy is (thus far) purely linguistic, and suggesting therefore that some (as yet unknown) functional pressure must exist. Absent a cognitive account, the best alternative is that some a fortiori constraints on mental grammars derives the CSG. I have offered the Containment Hypothesis (in tandem with elsewhere ordering) as the relevant constraint, as a property of Universal Grammar.<sup>12</sup>

### 2.3.2 Counting cognates

This brings us to the second point in connection with taking the the evidence for the CSG to be significant only in the broader, cross-linguistic context, and this is a more narrowly methodological issue. While there are numerous examples of suppletion in the material assembled here, and while the handful of apparent counter-examples seem likely to fall to an alternative account (see Chapter 4), there is nevertheless a very restricted distribution (in both geographic and genetic terms) to the component phenomena of the CSG (suppletion in adjectival gradation and morphological comparatives and superlatives). Outside of the Greater European Sprachbund (Indo-European,

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<sup>12</sup>In chapter 7, I will offer a very tentative speculation on why this might be a property of UG; the leading idea being that UG may impose a complexity threshold on certain classes of morphemes. The meaning of the superlative would, involving comparison and universal quantification over the standard, would exceed that threshold, and would thus necessarily be bi-morphemic.

Finno-Ugric, Kartvelian, Northwest Caucasian and Basque), the CSG is trivially true. The languages that supply the key evidence represent a large, but contiguous, geographic area. This raises the concern that the CSG, even if descriptively valid over hundreds of examples from numerous languages, could at its core be an effect of shared vocabulary, to be explained by a mixture of common inheritance and borrowing (or calquing) under contact, rather than through an appeal to a universal structural characteristic.

I suggest that this worry can be mitigated by looking more closely at the individual examples and being more careful about what we count in constructing the quantitative argument that the gap is not accidental. First, we must give up counting languages. In large geographically and genetically diverse samples, counting languages (as commonly understood) may be reasonable at getting a rough measure of the distribution of some phenomenon (see Bickel 2008 and references therein for relevant discussion). But in the case at hand, language-counting faces intractable problems. Most obvious among these is definitional: are Norwegian and Swedish (or Serbian and Croatian) one language, or two, or more? How many varieties of English are there? Even if we settle on some (essentially arbitrary) measure, the fact remains that many of the attested suppletive paradigms are not independent of one another. Consider, for example, the following Germanic paradigms for ‘good’:

(51)		POS	CMPR	SPRL
	a. English	<b>good</b>	<b>bett-er</b>	<b>be-st</b>
	b. German	<b>gut</b>	<b>bess-er</b>	(am) <b>be-st-en</b>
	c. Gothic	<b>gop-s</b>	<b>bat-iz-a</b>	<b>bat-is-t-s</b>
	d. Afrikaans	<b>goed</b>	<b>bet-er</b>	<b>be-ste</b>
	e. Swedish	<b>god</b>	<b>bätt-re</b>	<b>bä-st</b>
	f. Cimbrian	<b>guat</b>	<b>pez-ar</b>	<b>pez-ar-ste</b>

Almost all Germanic languages, spanning the globe from Norwegian to Afrikaans, from the oldest attested (Gothic) to the present, share a paradigm whose pieces are cognate to English *good* – *better* – *best*. Undoubtedly, this pattern arose exactly once, at some point in the dawn of Germanic (if not before), and the explanation of all of the attested triples is that they have inherited it from a common source. In weighing the evidence for the CSG, then, these cannot be counted as independent data points, and must collectively be counted as a single data point. To abstract away from the surface

variation, I will use all caps in representing the roots in the cognate sets; (51) is thus a single cognate set: GOOD – BE(TT) – BE(TT).

This same consideration must apply in evaluating the other examples brought to bear on the evidence for the CSG. In light of the close genetic and areal affinities in the data pool, it is clear we are not drawing from a random sample, but must aim for a comprehensive survey of the individual attested data points, where each data point is a distinct cognate triple (positive – comparative – superlative). As illustrated with Germanic, whenever there is a common cognate triple, shared vocabulary is the most ready explanation. It is only where the triples are distinct that there must have been some linguistic change, and it is only in the changes that common inheritance cannot be the entire account.

Pursuing this further, I take it that two cognate sets are distinct from one another, if (and only if) they differ in at least one of their component roots, though they need not differ in all. Thus, while (51) represents the majority of Germanic, there are two or three additional cognate sets for Germanic ‘good’, illustrated in (52):.

(52)		POS	CMPR	SPRL
	a. Swedish	<b>bra</b>	<b>bätt-re</b>	<b>bä-st</b>
	b. Giazza Cimbrian	<b>guot</b>	<b>beg-ur</b>	<b>beg-ur-ste</b>
	c. Old English	<b>gôd</b>	<b>sêl-(ra)</b>	<b>sêl-ost</b>

Swedish (52a) (also Norwegian) overlaps with (51) in the comparative and superlative, but differs in the positive root, thus we have BRA – BE(TT) – BE(TT). Another triple in (52b) is GOOD – WAEH – WAEH from the Cimbrian German variety spoken in Giazza (Italy), which retained the positive root (cognate to) GOOD, but forms comparative and superlative grades on a root descended from Middle High German *wäh(e)*, ‘artful, fine, dainty, good, etc.’ (Schweizer 2008, 397 and *DWB*, vol. 27). Old English *gôd* ‘good’ had two comparatives and superlatives, with the forms in (52c) attested alongside a GOOD – BE(TT) – BE(TT) triple (Sievers 1882, 108, Bosworth and Toller 1898, 858). Although these triples overlap in part with GOOD – BE(TT) – BE(TT), each is counted as a distinct triple, as each represents a separate innovation, and thus, in a sense, a distinct chance for an ABA pattern to have arisen.

Approaching the matter in this way, I count a total of somewhere just over one hundred distinct suppletive triples; see Chapter 4. (Providing an exact figure still requires some arbitrary choices, such as in cases where the relation

between positive and comparative forms is not 1:1.) Of these triples, there are a handful potential problems for the CSG: the Basque word for ‘good’ which shows a suppletive comparative, but a doublet in the superlative: *on* – *hobe* – *hobe-ren/on-en*; and apparent ABA patterns in the ‘many – more – most’ triples in Karelian, Aremian and Bulgarian/Macedonian. I discuss these examples in more detail in Chapter 4, offering tentative alternative explanations for each case. The remainder are mostly ABB patterns, with a few ABC cases like Latin *bonus* – *melior* – *optimus*. No putative AAB cases are attested in the data.

In sum, despite the areal and genetic limitations, there is sufficient variation within the data to be reasonably confident that the \*ABA and \*AAB gaps are not merely the accidental result of shared vocabulary. It is a real and systematic gap, in need of an explanation.<sup>13</sup>

### 2.3.3 (In)stability and change

A further argument against attributing the absence of an ABA pattern to shared vocabulary, whether through inheritance or borrowing, is that the vocabulary itself is quite typically not shared across languages, even where the overall pattern is. This can be seen by perusing the cognate lists in Table 4.1 in Chapter 4. While there is certainly an areal affect of having suppletive patterns for core adjectives (GOOD, BAD, BIG, MANY...), there is no evidence to support the claim that the patterns arise from borrowing of adjectives (as lexical items) across languages. Similarly, it is not the functional vocabulary as such (the morphological exponents of comparative and superlative) that are borrowed among languages leading to the areal diffusion of the nesting pattern.<sup>14</sup> Languages with transparent nesting vary

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<sup>13</sup>A rather naive application of basic statistical tests here yields robust significance, even with the apparent problematic patterns included. But what is really driving this result is the overwhelming number of ABB patterns as against anything else. Within a given language, it is plausible that the ABB pattern for one root influences the abstract pattern for others, and thus without knowing the weight of this effect, applying statistical measures seems at best premature. Relatedly, an assumption of equal proportionality as the null hypothesis seems highly implausible, but I see no clear way of establishing a baseline chance distribution of patterns.

<sup>14</sup>That is not to say that there is no borrowing in this domain. The particles that make periphrastic comparatives (and superlatives) are borrowed, creating in some cases new comparative constructions in the target languages. Some languages of South and Central America have borrowed Spanish *mas* or Portuguese *mais* to form periphrastic comparatives

widely in the resources they draw on to derive the nested structure (see the next chapter).

Even within a single family, there is significant variation in the actual lexical items (exponents) that make up a given suppletive pattern. Where Germanic shows a remarkable stability in the GOOD – BE(TT) – BE(TT) pattern, not all patterns are nearly as stable. The Slavic ‘good’ patterns show remarkable volatility. In the earliest documented language, Old Church Slavonic (OCS), the form for ‘good’ had a regular comparative, and alongside this, had additional suppletive comparative options.<sup>15</sup>

(53)	POS	CMPR
	a.	<b>dobrŭ</b> <b>dobr-ěi</b>
	b.	— <b>luč-ĭi</b>
	c.	— <b>unj-ĭi</b>
	d.	— <b>sul-ĭi</b>

Bulgarian and Macedonian alone among the daughter languages preserve a regular comparative for ‘good’. Exclusively suppletive patterns have arisen in all the other languages, most resolving to a single option, rather than the one:many situation attested in OCS.<sup>16</sup>

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(Tarascan, Chamoreau 2003; Paumarí, Chapman and Derbyshire 1991), while indigenous languages of Russia have borrowed Russian *bolee* and/or *samyj*. In a few cases, morphological comparatives and superlatives are borrowed, but in borrowings from Sanskrit and Persian into Hindi, (McGregor 1972), and from Tajik into Yagnobi (Khromov 1972), for example, the borrowed morphology is only used with borrowed adjectives. More common is borrowing of forms that constitute suppletive comparatives in the donor language, but lose their comparative morphosyntax in the recipient language, serving as intensifiers, in some cases subject to further comparison or superlative formation. Examples of this sort include Persian *beh-tar* ‘better’ into Hindi and Turkish, and (ultimately) Latin *optimus* into English *optimal*, an adjective with a meaning like ‘best’ but which is not morphosyntactically a superlative form.

<sup>15</sup>The status of the superlative here is somewhat unclear, but orthogonal to the immediate point. Most sources note that the superlative is formed by adding *naj-* to the comparative (e.g., Vondrák 1900, 161) and none note any irregularities in the formation of *naj-* derivatives. On the other hand, Diels (1963, 201, n.3) claims that OCS had no means of forming a superlative, stating that the *naj-* prefix is very rarely found, and when it is, has in the first instance essentially no superlative meaning. Evidently, the prefix became the standard means of forming morphological superlatives in all the daughter languages, so this quibble is moot here.

<sup>16</sup>Superlatives for (54c,f) were not given in the sources from which these were taken, but the sources indicates superlatives formed by *naj-* prefixation to the comparative.

(54)		POS	CMPR	SPRL
	a. Bulgarian	<b>dobər</b>	po- <b>dobər</b>	naj- <b>dobər</b>
	b. Czech	<b>dobr-ý</b>	<b>lep-ší</b>	nej- <b>lep-ší</b>
	c. Sorbian (%)	<b>dobr-y</b>	<b>redl-iši</b>	
	d. Serbian	<b>dobar</b>	<b>bol-ji</b>	naj- <b>bol-ji</b>
	e. Ukranian	<b>dobr-yj</b>	<b>krašč-yj</b>	naj- <b>krašč-yj</b>
	f. Ukranian	<b>harn-yj</b>	<b>krašč-yj</b>	
	g. Russian	<b>xoroš-ij</b>	<b>luč-še</b>	(nai- <b>luč-še</b> )

The consistency of the Slavic patterning (all are ABB patterns, except Bulgarian) is not the result of shared vocabulary, since the vocabulary items (roots) themselves are not shared. None of the suppletive patterns in (54) reflects roots in both the positive and comparative from the OCS patterns in (53). The Ukranian and Czech comparative roots were not (so far as available sources indicate) comparatives of ‘good’ in OCS, and *bol-ji* (54d) was one of two suppletive comparatives for ‘bigger’ in OCS (Vondrák 1900, 160, Lunt 1959, 66). Russian retains an OCS comparative root, but the positive root *dobr-* has been usurped by *xoroš-*. What the languages have in common is not the specific vocabulary, but rather the more abstract ABB pattern (Mel’čuk 2006, 456).

Similarly, one finds a common ABB pattern for ‘small – smaller – smallest’ in a variety of Indo-European languages, with a shared comparative root *min-* but variation in the positive roots:<sup>17</sup>

(55)		POS	CMPR	SPRL
	a. Latin	<b>parv-us</b>	<b>min -or</b>	<b>min-imus</b>
	b. OCS	<b>mal-ŭ</b>	<b>mŭnj-ŭ</b>	
	c. Czech	<b>mal-ý</b>	<b>men-ší</b>	nej- <b>men-ší</b>
	d. Gothic	<b>leit-il-s</b>	<b>minn-iza</b>	<b>minn-ists</b>
	e. Danish	<b>lille / små</b>	<b>mind-re</b>	<b>mind-st</b>
	f. Ancient Greek	<b>mīkr-ós</b>	<b>meí-on</b>	<b>meĩ-stos</b>

On the basis of such evidence, one might contend, then, that it is not vocabulary that is shared (by borrowing and/or inheritance) but rather something more abstract, such as the ABB pattern. The account offered here

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<sup>17</sup>That the Greek forms belong in this paradigm, with the comparative cognate to those in *min-* but the positive root unrelated, is asserted based on Frisk (1960-1970). The Slavic root *mal-* is related to Germanic *small*, and not to the comparative, according to Vasmer (1953-1958)

explains why that pattern is shared: it is precisely the pattern that arises by default, whenever the comparative is suppletive, if (i) the Containment Hypothesis holds, and (ii) rules of exponence are subject to elsewhere ordering. Simply declaring that abstract patterns may be inherited or borrowed does not provide any clear alternative – it is the description which the UG-based account aims to explain. There is clear evidence in fact that the overall patterning is susceptible to change, inasmuch as suppletive patterns rise and fall.

The Slavic examples for ‘good’ illustrate this point. OCS had a one:many pattern, with the suppletive comparatives forming ABB doublets alongside a regular AAA pattern (53a). Yet, none of the daughter languages retains the OCS pattern. Simply saying that abstract patterns are retained strikingly fails in this case to explain the facts.<sup>18</sup>

Similarly, adjectives that show a suppletive pattern in one language may undergo regularization in daughter languages (ABB → AAA), sometimes giving rise to doublets in the daughter languages, the opposite of the change in Slavic ‘good’ paradigms. Compare thus Swedish *god – god-are – god-ast*, a regular triple for ‘good’ in the sense of ‘pleasant-tasting’, or colloquial English *bad – badder – baddest*, (the only morphological comparative form available for ‘bad’ in the sense of ‘cool, hip’; see section 6.4, below). In Homeric Greek, *agathos* ‘good’ formed only suppletive comparatives, but the adjective regularizes in Old Testament Greek (comparative: *agathō-teros*, superlative: *agathō-tatos*; Liddell and Scott 1996).

In the other direction, innovative suppletive patterns arise where none existed before (AAA → ABB). Swedish *bra* (in (52a) is one such example (the SAOD gives 17th century *braf – brafv-are – braw-ast-e*). Another may be provided by OCS *mŕnogŭ* ‘many’, which is given as undergoing regular comparison in (*množai* ‘more’, Diels 1963, 201, n.2; Lunt 1959, 66), but which forms suppletive patterns in the daughter languages (although Krause and Slocum 2002-2004 give a suppletive comparative for this even in OCS). Another innovated suppletive paradigm is the Old Icelandic paradigm for ‘old’ — this adjective is regular (more accurately, non-suppletive) throughout Germanic, but the positive root underwent lexical replacement in Old Icelandic yielding a new ABB paradigm (retained in the daughter languages).

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<sup>18</sup>The most striking cases of one:many relations in suppletive comparatives are in Old Church Slavonic and Ancient Greek, both written languages representing an area with multiple dialects. There is thus a specter of artificiality about this relationship, though that does not affect the point made here, namely, that there is variation within Slavic.

(56)		POS	CMPR	SPRL
	a. Gothic	<b>alp</b> -eis	<b>alp</b> -iz-a	
	b. Old English	<b>eald</b>	<b>ield</b> -ra	<b>ield</b> -est
	c. Old Icelandic	<b>gamall</b>	<b>ell</b> -re	<b>ell</b> -ztr

In sum, it is not the case that suppletive patterns as such are immutable. The ABB pattern (and the absence of an ABA pattern) holds a special place in the array of reconstructable changes, and the theory here explains why this is so. By hypothesis, the superlative is always derived from the comparative. Hence, if a suppletive pattern arises, for example, by replacement of the positive root (as in (56)), then the superlative will not follow suit, but will instead remain tied to the comparative. Likewise, if the comparative changes, then the superlative will change in tandem, tied as it is to the comparative. This holds whether by the relevant change is the resolution of doublets (as in (54)), the innovation of a new comparative root (as possibly in Slavic words for ‘many’ mentioned above (56), or as in the change by which *little* in Old English was compared by *less* ((57b), compare (55)).

(57)		POS	CMPR	SPRL
	a. Gothic	<b>leit</b> -il-s	<b>minn</b> -iza	<b>minn</b> -ists
	b. Old English	<b>lytel</b>	<b>laess</b> -a	<b>laes</b> -(as)t

The only permitted exception to the default suppletive pattern of ABB is the possibility for a marked ABC pattern to arise, as in Latin, where three separate roots are listed. ABA does not arise, not because the vocabulary of suppletive patterns is generally inherited, nor because the abstract suppletive patterns are passed down intact from mother to daughter languages as such, but rather, because UG excludes a means to derive a pattern with two roots organized in such a way that the comparative is the odd one out, with a single root shared between the positive and the superlative.

## 2.4 Summary

In this chapter, I have argued that there is an intimate relationship between comparatives and superlatives, and that this relationship is manifest as proper containment of the former in the representation of the latter. There is no (relative) superlative morpheme that attaches directly to adjectives, despite appearances to the contrary in languages like English. The primary

evidence for this conclusion, as discussed in this chapter, was the CSG, the relationship among root suppletion in comparatives and superlatives, discussed in the abstract in section 2.2, with a more careful discussion of the data (and apparent counter-examples) in section 4. Because the primary evidence for the generalization is from a striking gap, and moreover because the strikingness of the gap is apparent only in large, cross-linguistic comparison, the results point to the hand of UG in accounting for this state of affairs. I will return in chapter ?? to a tentative proposal about why this might be the case, but first, we turn in the next chapter to further evidence for the Containment Hypothesis, as well as some related considerations that arise in that discussion.



# Chapter 3

## The Containment Hypothesis

### 3.1 Introduction

The previous chapter laid out the core of a theoretical account of a gap in suppletive alternations, codified as a linguistic universal in the form of the CSG in (33) in the previous chapter. The key premise in this account is the Containment Hypothesis (58), of which nesting (see (36a)-(37) in Chapter 2) was a specific structural instantiation.

- (58) The Containment Hypothesis  
The representation of the superlative properly contains that of the comparative  
[in all languages that have a morphological superlative].

This hypothesis, together with a theoretical model of morphosyntax that allows the Elsewhere principle to apply to suppletive stem alternations, yields the important result that the ABA pattern *\*good – better – goodest* is unstatable (see section 2.2). Since the pattern is virtually unattested, this appears to be a welcome result, explaining this gap as a consequence of a structural universal. The success of that explanation thereby constitutes an argument for the Containment Hypothesis, and we now turn to the question of whether there is additional, independent evidence for that hypothesis. This chapter evaluates the strength of such evidence, from two morphological domains (affix co-occurrence and affix inventories) and, briefly, from semantics. I also discuss the interaction of morphological and periphrastic superlatives, where some additional generalizations, but also some new puzzles, arise (as men-

tioned briefly in the discussion of Bulgarian and Macedonian in the preceding chapter).

## 3.2 Transparent Containment

### 3.2.1 Transparent Nesting

I noted in the previous chapter that the containment relation is morphologically transparent in Czech, and indeed, it is transparent in a wide variety of languages that have morphological comparative and superlative degrees, including most Slavic languages (but not Russian or Bulgarian), also Lithuanian, Latvian, Persian, Hungarian, one variety of Saami, Georgian (to the extent there are morphological comparatives and superlatives, see the remark above (155) in chapter 2), Batsbi, Ubykh, and Chukchi. Examples are given in (59) (where ‘X’ represents the adjectival root; these forms are not in all cases the only, or the most productive, exponents of the relevant degree morphology):

(59)		CMPR	SPRL
	a. Persian:	X-tær	X-tær-in
	b. Lithuanian:	X-iau	X-iaus-ia
	c. Cimbiran German:	X-ar	X-ar-ste
	d. Batsbi:	X-vx	X-vx-č
	e. Latvian:	X-âk	vis-X-âk
	f. Czech:	X-ši	nej-X-ši
	g. Hungarian:	X-bb	leg-X-bb
	h. Chukchi:	X-əŋ	ənan-X-əŋ
	i. Cherokee:	X-ka/ya/...	w-X-kãʔi/yãʔi/...
	j. Ubykh:	ç’a-X	a-ç’a-X

In Paiwan (Austronesian, Formosan), the superlative circumfix *tjala-...-an* also appears to contain the comparative particle *tja*, although (Egli 1990, 149) does not offer a segmentation of the superlative. In American Sign Language as well, the morphological superlative appears to contain the morphological comparative (although only a small set of adjectives have morphological grades): the sign glossed -EST (a suffix) consists of the -ER sign but uses a greater extent of movement, suggesting the superlative could be

analyzed as the comparative plus an intensifier (D. Lillo-Martin, personal communication, 2010).

Ultan (1972, 140-1) noted that shared morphology (whether affixal or periphrastic) between the comparative and superlative is exceedingly common in his sample, and that while this sharing often takes the form of embedding just illustrated, the reverse embedding is unattested: superlatives are often derived from comparatives, but comparatives are never derived from superlatives.<sup>1</sup>

A nested structure is also attested for comparatives in older Indo-European languages, and is reconstructed for Proto-Indo-European (Seiler 1950, 6; Bopp 1856, 374-415; Kuryłowicz 1964, 227-239; Weiss 2009, xx). Even Modern English superlative *-est* is historically transparent, with the *-es-* portion sharing an origin with the comparative *-er*; compare the Gothic forms in (60a).<sup>2</sup>

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<sup>1</sup>Note that Ultan's classificatory criteria were different from those used here in ways which mean that his claim, though ultimately correct, needed to be reevaluated. For example, Ultan does not distinguish, in making this claim, among morphological and periphrastic marking of comparative and superlative, and includes 'exceed'-type comparatives, which are always formally identical with superlatives, in this pool of data. Note also that some of Ultan's illustrative examples turn out, on closer inspection, to be absolute, not relative superlatives. His first example of a superlative formed of a comparative plus an additional element is the Tswana example in (i), where Ultan indicates that reduplication of the intensifying adverb *bogolo*, used in comparatives, constitutes the formal marking of the superlative.

- (i) tlôu      ethata bogolo-bogolo môdiphôlôgôlông  
 elephant strong more-more    LOC.animals

'The elephant is the strongest of the animals.' (Ultan 1972, 140)

However, the description of comparative and superlative formation in Cole (1955, 423-5), from which Ultan's example is taken, makes it clear that the adverb here is an optional intensifier in the comparative construction (and not the marker of comparison per se), and that there is no formal distinction between comparative and superlative, although the latter is formed "sometimes with the additional use of the reduplicated and therefore more intensive adverbs *bogolo-bogolo* and *thata-thata*" (Cole 1955, 424).

<sup>2</sup>Various qualifications are in order regarding the older languages, and I thank Andrea Calabrese, W. U. Dressler, and Michael Weiss for their help at various points with this material. Proto-Indo-European had at least two formatives that yielded comparatives, only one of which, *\*-ios-*, with zero-grade *\*-is-*, was contained in the corresponding superlative. Comparatives in *\*-tero-* have corresponding superlatives in *\*-tmmo*, with no overt containment. Note also that the Latin *-issimus* was not the only means of forming superlatives. See Kühner and Holzweissig (1912), Cowgill (1970), Weiss (2009) for discussion of Latin

(60)		CMPR	SPRL
	a. Gothic:	-iz-a	-is-ts
	b. Sanskrit:	-(i)yās	-iṣ-ṭhas
	c. Latin:	-ior < -ios	-issimus < -is-m.mo-s
	d. P-IE:	*-iōs-, *-is-	*-is-to-s

Note that what is common in (59) and (60) is the structural relation among the grades; there is wide variation in how the superlative is formed from the comparative. Superlatives may be suffixal (as in Lithuanian, Persian, and Saami) or prefixal (as in Hungarian, Latvian and Czech), and the etymological source of the superlative morphology varies. The superlative prefixes in (59) all show different origins: in Latvian, the prefix is the root meaning ‘all’, in Czech, it is etymologically a preposition and pronoun (roughly, ‘on it’), in Hungarian an intensifier of sorts,<sup>3</sup> in Chukchi an emphatic pronoun (roughly ‘self’, Russian *sam*; Skorik 1977, 334), and in Ubykh, the prefix is the definite article. The generally accepted origin for the PIE suffix *\*-to-* is also something like a marker of definiteness or individuation (see Cowgill 1970 for extensive discussion).

The derivation of superlatives from comparatives is also evident in many languages in which the (relative) superlative is formed periphrastically. One periphrastic superlative-forming strategy involves the addition of a definite article (or other definiteness marker) to the comparative (whether the comparative is itself formed morphologically or periphrastically). Some examples are given in (61) (another strategy will be discussed in section 3.2.3). This is the normal pattern in all the Modern Romance languages (exemplified by French in (61a) and, with a definite pronoun/demonstrative-like element rather than the article, Romanian in (61b)) and in Modern Greek, in which morphological and periphrastic comparatives are in free variation, and both form superlatives with the definite article (as in (61c)). The pattern is attested as well in some varieties of Austrian German, including Upper Aus-

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comparatives and superlatives in their historical context.

<sup>3</sup>The prefix *leg-* attaches to spatial adverbs without a comparative suffix, to form pairs such as *alsó – leg-alsó* ‘down’ – ‘bottommost’; see note ???. The superlative prefix can also be doubled to form an ‘excessive’ grade, thus: *nagy* ‘big’ – *nagy-obb* ‘bigger’ – *leg-nagy-obb* ‘biggest’, and *leg-es-leg-nagy-obb* ‘the very biggest’ (Kiefer 2001, 277). On the etymological source of the Hungarian superlative, and evidence that it is a relatively late innovation (16th Century), see Fuchs (1949). Fuchs (p.226) also gives examples from Hungarian dialects of a borrowed Slavic prefix for superlatives, which adheres to the pattern in (59), thus compare: *náj-nagy-obb* ‘biggest’ to the standard Hungarian forms just cited.

trian (Martin Prinzhorn, Martin Hackl, personal communication 2010), and also in Maltese (in some cases with a change in word order), Neo-Aramaic (Arsanis 1968, 496), Middle Armenian (Karst 1901, 395), and, alone among the Fennic languages, Livonian (Nau 1992, 17).<sup>4</sup>

(61)		POS	CMPR	SPRL	
	a. French:	gros	plus gros	le plus gros	‘big’
	b. Romanian:	bun	mai bun	cel mai bun	‘good’
	c. Greek:	psilós	pio psilós	o pio psilós	‘tall’
		or:	psiló-teros	o psiló-teros	
	d. Maltese:	kbir	ikbar	l-ikbar	‘big’
	e. Livonian:	vanā	vanīm	se vanīm	‘old’

Compare also in this light some of the Celtic languages. Standard descriptions of (Modern) Irish, Manx and Scottish Gaelic characterize these languages as lacking a morphological distinction between comparative and superlative, with the distinction indicated by context and/or syntax (Breton and Welsh retain a morphological superlative grade). For example, Phillips (2004, 29) writes: “[t]hough Manx does not make the formal distinction that English does between comparative and superlative meanings, the definite article can be used to express uniqueness, as in [(62)].”<sup>5</sup>

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<sup>4</sup>The use of a definiteness marker (or demonstrative) to form the superlative also occurs in languages in which a comparative construction involves no overt marking on the adjective, or property-denoting predicate, as in Tamashek (Berber) (Hanoteau 1896). If the definite article is indicative of an NP (or DP) structure, then languages that use a nominalizer to form the superlative would also belong to this type. Mixtec is of this sort (the ‘additive’ suffix in these examples appears to be a type of contrastive or emphatic marker, and not a comparative suffix as such):

- i. rù?ù sùkú=ka=rí asù ro?o  
 I tall=ADD=1 than you  
 ‘I am taller than you.’
- ii. ro?o kúu xa-náxini=ka  
 you COP NOM-drunk=ADD  
 ‘You are the drunkest.’ (Macaulay 1996, 162-164)

<sup>5</sup>I thank John Phillips for drawing my attention to the distinct descriptive traditions here, and to the question of whether this is a distinction without a difference.

- (62) yn boayl share  
 the place better/best  
 ‘the best place’ (Phillips 2004, 28)

Arabic is also described as having no morphological distinction between comparative and superlative, with a single “elative” form used in both contexts. Grammars note that a variety of syntactic devices can be used to draw the distinction between comparative and superlative meanings, including the use of the definite article on (or defined form of) the adjective (following a definite noun), as illustrated by this pair from Gulf Arabic (the comparative is formed with the template  $(?)aCCaC$ ):<sup>6</sup>

- (63) a. il-banaat **ʔashTar** bi kathiir min al-awlaad  
 the-girls clever.CMPR by much than the-boys  
 ‘The girls are much cleverer than the boys.’ (Holes 1990, 91)
- b. 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.’ (Holes 1990, 231)

Other languages in which a single form may serve either as a comparative or superlative include Klon, a Papuan language of Alor, Indonesia, as described in Baird (2008, 116) and Misantla Totonac, an indigenous language of Mexico (MacKay 1999, 413).

It is not clear to me whether there is a meaningful line to be drawn between languages described as drawing no distinction between comparative and superlative (Celtic, Arabic, Klon, Totonac), and those described as deriving superlatives from comparatives with the aid of a definite article (Romance, Greek, Maltese etc.). A case in point is Vlach Romani. Three descriptions of this collection of dialects differ on exactly this point. (Hancock 1995, 77) describes Vlach as being like Modern Romance (the comparative particle *maj* is a Romanian borrowing): “*Maj* alone plus the adjective gives the comparative, ... while with the appropriate definite article it translates the superlative.” Describing the Lovari variety of Vlach Romani, Pobożniak (1964, 45-46) treats it in Celtic-like terms, stating that there is no special

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<sup>6</sup>The superlative in Moroccan Arabic can be formed either by placing the comparative form (for adjectives that have one) in the construct state with the noun it modifies, or by using the simple adjective in conjunction with the definite article (Harrell 2004, 205).

exponent of the superlative, distinct from the comparative, but that the article may be used (embedding the comparative) “if it is necessary to make a distinction between the comparative and the superlative.” In yet a third description, Boretzky 1994, 48 specifically contrasts Kalderaš (Vlach) Romani with Romance: “The placement or non-placement of the article may not serve for the distinction of the two grades of comparison (as is partially the case in the Romance languages)...”<sup>7</sup>. By and large, it appears we may well be dealing here with a difference in descriptive traditions, rather than a grammatical distinction between language types. It may be that the meaning of a comparative plus a definite article comes close enough to rendering the superlative meaning that it frequently serves as such, while not rendering all nuances of a grammatical superlative, thus leaving room for the variation in descriptive perspectives. In this regard, note that the pattern of (apparently) deriving superlatives by means of a comparative plus a marker of definiteness seems to have arisen independently on many occasions, suggesting something rather basic about this pattern. Within Indo-European, the Modern Romance languages, Greek, Vlach Romani, and those Modern Celtic languages that have this pattern (if that is indeed what (62) shows), as well as Upper Austrian, all developed from ancestors with a morphologically distinct superlative grade.

Another question is whether the combination of a definite marker and a comparative, with a superlative meaning, should be treated as containing a formal (but unpronounced) superlative element (i.e., a superlative node, as in (37)) or whether the superlative meaning can be derived from the semantics of the comparative and definiteness alone. If there is no covert superlative element in such representations, then they cannot be taken as support for the Containment Hypothesis. They are consistent with the hypothesis, but only trivially so, in the sense that such languages may lack a grammatical superlative category altogether. On the other hand, if the combination of a definite article plus the comparative were sufficient to derive a superlative meaning (with no null elements, or equivalent semantic devices such as type-shifting operations or other postulates), then this reading should be routinely available in other languages, such as English, where it is not (except in the superlative comparing two items: (*Of the two books*), *the shorter one is on the table*). I therefore leave this question open.

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<sup>7</sup>Original: “Die Setzung oder Nichtsetzung des Artikels dürfte nicht zur Unterscheidung der beiden Steigerungsstufen (wie teilweise in romanischen Sprachen) dienen...”

Either way, there is abundant morphological and morphosyntactic evidence that the comparative is properly contained inside the superlative in many languages. The CSG effectively follows from the assumption that this widely observable structural relationship is indeed present in all languages with comparative and superlative grades of adjectives.

### 3.2.2 The Fennic Superlative: Branching Affixes?

Returning to morphological formations, Finno-Ugric languages also provide evidence that the superlative properly contains the pieces of the comparative, but Finnish (and some varieties of Karelian) provide a wrinkle in terms of affix order.<sup>8</sup> The containment relation, and the affix order it poses, are not obvious in the citation (nominative) forms (as in in (64)). In nominative, complex morphophonology obscures the underlying forms of the affixes—comparative *-mpi* and superlative *-in* are in fact derived from *-mpa* and *-impa*, respectively (see Hakulinen 1957).

(64)	POS	CMPR	SPRL	
	a. paksu	paksu-mpi	paksu-in	‘thick’
	b. uusi	uude-mpi	uus-in	‘new’
	c. hyvä	pare-mpi	parha-in	‘good’

The relationship is transparent in oblique cases, such as the illative, shown in (65).

(65)	POS	CMPR	SPRL	
	a. paksu-un	paksu-mpa-an	paksu-imp-a-an	‘thick’
	b. hyvä-än	pare-mpa-an	parha-imp-a-an	‘good’

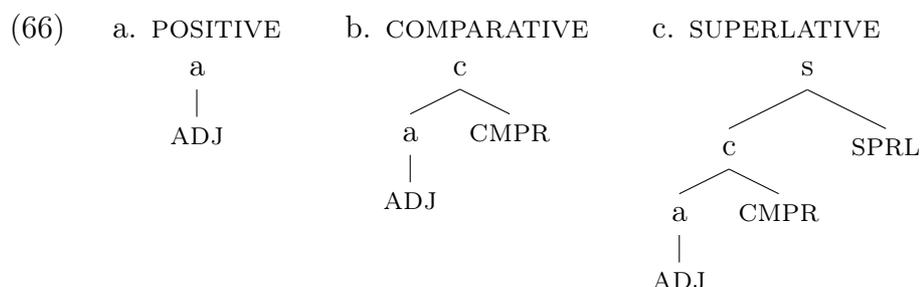
The issue raised by this pattern is that the superlative does indeed seem to contain the pieces of the comparative, plus something in addition (namely, the vowel *-i-*),<sup>9</sup> but with respect to a nesting structure as in (37) of Chapter

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<sup>8</sup>This pattern also holds for some adjectives in Standard Estonian (Tauli 1973, Viitso 1998), although the synthetic superlative in Estonian is characterized as occurring primarily in the written language, where some authors claim it is a Finnish calque (see Nau 1992, 16 and Laakso 2001, 198). Other Fennic languages do not have a synthetic superlative.

<sup>9</sup>The comparative suffix is reconstructed to Proto-Uralic (see, e.g., Fuchs 1949, Sammallahti 1998, 81), but the superlative element in *-i-* appears to be a Fennic innovation. Saami shows comparatives in *-bu*, cognate to Finnish *-mpi* (and Hungarian *-(V)bb*, but the Saami superlative suffix is *-mus*, for which Sammallahti (1998, 81) gives a distinct

2, repeated here as (66), the linear position of this superlative element (if that is in fact what it is<sup>10</sup>) is surprising, sandwiched between the base and the comparative suffix.



One possible avenue of analysis is to reconsider whether a strictly nested structure as in (66) is the only way to represent the Containment Hypothesis that underlies the account of the CSG. If nesting is the only option, then the Finnish facts pose a challenge. On the other hand, there are other structural relationships to consider, among these, structures with a branching affix, as in (67a-b), which are hierarchically identical but differ only in the linear order of the comparative and superlative nodes under the placeholder node label *x*.<sup>11</sup>

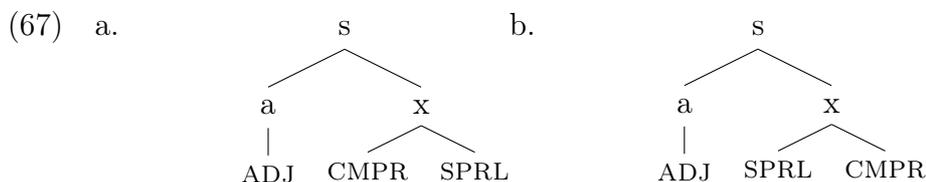
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etymology, not containing the comparative. Rießler (2007) suggests that Kildin Saami has innovated a transparently nested structure, with superlatives in *-a-mus* containing the comparative *-a*, from older *-amp* together with the Saami superlative formative.

Although the suffix in question is reconstructed for Proto-Uralic, it only has a comparative sense in Saamic-Fennic and Hungarian, whereas in the Samoyedic languages the reflex of this suffix survives with a tempering or relativizing meaning, for example as in Nenets *-mboj* ‘rather X’ (Décsy 1966, 59, see also Fuchs (1949)). It is worth noting in light of section 2.3 that the group of languages within Uralic for which the modern suffix is a comparative do not form a single branch, but are those which are spoken in areas historically adjacent to Indo-European languages. A blurry boundary between a relativizing and a comparative function is also seen in Turkic *-raχ*.

<sup>10</sup>These languages are well known for a rich and complex system of stem alternations, and the final *-i-* is characteristic of (a class of) plural stems. In Estonian, for example, Tauli (1973, 86) notes that the stem of the superlative for some adjective classes is identical to the so called *i*-stem of the plural. At least in theory, then, it is possible that the *-i-* is part of a stem alternation and not an exponent of the superlative, as such. It is perhaps worth noting that in related Udmurt, the comparative suffix follows the plural suffix on adjectives (Winkler 2001, 40).

<sup>11</sup>Such structures could be base generated or derived from (66) by morphological operations such as rebracketing under adjacency (Kiparsky 1983, Sproat 1985, Radkevich 2010) or a variety of merger (Marantz 1989, Embick and Noyer 1999).



The tree in (67b) would readily accommodate the morpheme order in the Fennic examples. The theoretical question, then, is: does this structure contain the comparative in the right way to force the comparative root allomorph to be selected in the superlative (in (64c) and (65b))? To make this concrete, the relevant fragment of the Finnish Vocabulary is given here, modeled on previous examples.<sup>12</sup>

- (68) a. GOOD → par(e)-      ] CMPR ]  
 b. GOOD → hyvä  
 c. SPRL → -i-  
 d. CMPR → -mpa

Broaching the question in any detail goes beyond what I wish to address in this chapter, and I will return to the question in chapter XX. For now, I note that there are a variety of assumptions on the market that could yield the answer ‘yes’, in which case the account remains unchanged. For example, if the node *x* in (67) bears the label CMPR – either because [COMPARATIVE] is a feature subject to percolation, or because CMPR is the head of the subtree *x* and thus projects – then the adjectival root is both structurally and linearly adjacent to a CMPR node, even in (67b), satisfying the context for (68a). An empirical argument for an analysis along these lines can perhaps be made from Basque.

Basque comparatives are formed with the suffix *-ago* (as in (69a-b)). Basque also has a morphological means for expressing a slight degree of superiority, namely the suffix *-xe* (de Rijk 2008, 711). This suffix occurs between the adjective root and the comparative (as in (69c)):

- (69) a. high                    gora  
 b. higher                    gor-ago  
 c. a little higher        gora-xe-ago

On semantic grounds, it seems most plausible to assume that *-xe* combines first with *-ago*, as it modifies the degree of comparison, and not the adjective

<sup>12</sup>I treat the alternation *pare-* ~ *parha-* as irregular, and not suppletive; see xx.

root. That is, the meaning appears to be [ [ a little more ] X ] and not [ more ] a little X ]. If this assumption is correct, then *xe-ago* represents a complex affix, like (67b). In particular, the element *xe* is a modifier, not the head, and hence the whole element is a (species of) comparative, even though linearly, *xe* intervenes between the adjectival root and the (regular) comparative exponent.<sup>13</sup>



These considerations predict that *xe-ago* should behave as *ago* alone for the purposes of suppletion triggered by the comparative. And this is indeed correct, as (71) shows (de Rijk 2008, 710-711):<sup>14</sup>

- (71)
- |    |               |             |
|----|---------------|-------------|
| a. | much          | asko        |
| b. | more          | gehi-ago    |
| c. | a little more | gehi-xe-ago |

It appears, then, that both on theoretical and empirical grounds, branching affixes constitute a viable structure, and that moreover, in at least some configurations of the form in (67b), a sub-part of a branching affix may stand in the right configuration to govern root allomorphy. I conclude, then, that there are no particular hurdles to positing a branching affix structure for the Fennic superlative. This jibes with Ultan’s observation, mentioned above, that no language derives a comparative from an independent superlative stem. Finnish (and its close relatives) are no exception: although the

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<sup>13</sup>An apparently similar construction exists in Lithuanian, with the element *-ėl-* interposed between the adjective root and the comparative suffix, as in *maž-ėl-ėsnis* ‘small-EL-CMPR’ = ‘a little smaller’ (Vasiliauskiene and Slocum 2005-2007). However, Lithuanian shows no suppletion in adjectival gradation and thus the prediction discussed immediately below cannot be tested in that language.

<sup>14</sup>The forms for ‘good’ are also suppletive in Basque, with suppletion carrying over to the *-xe-* comparative: *on - hobe - hobe-xe-ago* ‘good - better - a little better’ (de Rijk 2008, 711). There are two further complications regarding the good paradigm, namely, the absence of *-ago* in the true comparative, versus its presence in the *-xe-* grade, and the interaction of adjacency with the corresponding adverbial forms; I return to these in Chapter 5.

comparative affix appears to be peripheral to the superlative, the superlative consists of all the morphemes in the comparative, plus an additional morpheme, and not the other way around.<sup>15</sup>

The structure in (67a) is also an alternative to consider for languages like Persian and Lithuanian in (59) (where both comparative and superlative are suffixal). For that matter, structures such as (67) provide a possible alternative to positing a zero allomorph of the comparative (as in (42)) for languages in which the nesting is not transparent, and in which comparative and superlative are both suffixes (as in English) or both prefixes (as in Bulgarian — but see section 4.3). In such languages, the superlative could be analyzed as a portmanteau affix, inserted at node *x*, as in (72) (a-b are English, c-d Bulgarian; on the formal treatment of portmanteaus, see xx below):

- (72) a. SPRL, CMPR → -est  
 b. CMPR → -er  
 c. SPRL, CMPR → naj-  
 d. CMPR → po-

A final remark on the branching affix structure is that a structure like (67) may actually provide a more seamless integration with the semantics of the comparative, at least on many approaches. In various current semantic theories, the comparative takes as its first argument the (degree corresponding to the) standard (i.e., the *than*-clause in English), and only then does it combine with the adjective (see Heim 2000, 1985, Lechner 2004 among others).<sup>16</sup> If the superlative means something like ‘than all others’, then a branching affix structure would in fact represent the semantics transparently, while a more canonical nested structure (as in (66)) would require additional

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<sup>15</sup>The morpheme order ADJ-SPRL-CMPR is also given for Epena Pedee in Harms (1994, 81) but from the description and the one example given (glossed as ‘the other smallest one’ this appears to be an intensified comparative (‘even more’) and/or absolute superlative. If the Paiwan superlative *tjala-...-an*, mentioned briefly below (59) does indeed contain the comparative *tja*, then the structure of this superlative is also more complex than a simple nesting structure. The element *-la-* in the prefix *tjala-* may be segmentable as an emphatic element, on the strength of ‘weak intensifier’ *ka-...-an* versus superlative *kala-...-an* (Egli 1990, 148-149). The element that derives superlatives in Mongsen Ao likewise occurs inside the comparative-forming suffix, but it is not clear that these are genuine comparatives as opposed to relative clauses; see note 8.

<sup>16</sup>Though note that for Lechner (2004), the comparative affix is not the interpreted degree head but in essence a type of agreement between the adjective and the null comparative head.

operations to yield the correct interpretation. Pushing this further, it is then languages like Latvian and Czech, in which the comparative and superlative affixes are on opposite sides of the root, that are difficult to accommodate under a branching structure, and suggest that the nesting structure is also needed.

For the remainder of this chapter, I will set aside the possibility of branching affixes, using nested structures in general to illustrate containment relations, but it is important to keep in mind that we now understand this to be an expository simplification — there are multiple means of satisfying containment structurally, including branching and nesting. For a class of languages, including English, we are left with two possible analyses of some cases (such as the English superlative), but with no pressing need to decide between them.

### 3.2.3 Aside: More than anything

Before concluding this section, there is a further point that bears mention regarding the formation of periphrastic superlatives. This section is somewhat of a side point, and may be skipped with no loss to the main argument, although it connects to the question raised above about what constitutes a grammatical superlative (as opposed to an expression with superlative meaning, but no grammatical superlative element).

In section 3.2.1, we considered periphrastic superlatives formed by a combination of the comparative and a marker of definiteness, with no overt superlative morpheme. There are other means of forming periphrastic superlatives from comparatives. Prominent among these is the use of a universal quantifier in the form that normally marks the standard of comparison; another is the use of an intensifier, along with the comparative. Both types are attested in Russian, as in (73).<sup>17</sup>

(73)	POS	CMPR	SPRL
a.	xorošij good-M.SG	luč-še better-CMPR	luč-še vse-go/-x better-CMPR all-GEN.SG/-GEN.PL
b.	xoroš-ij good-M.SG	luč-š-ij better-CMPR-M.SG	sam-yj luč-š-ij same-M.SG better-CMPR-M.SG

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<sup>17</sup>The tripartite pattern in (73b) occurs only with the long form of ‘better’, itself one of the very small set of suppletive inflected comparatives; otherwise, the superlative embeds the positive grade. The form *sam-ij xoroš-ij* is possible alongside (73b).

The combination of a comparative (or sometimes positive) adjective with a universal quantifier is in fact the most common pattern of forming superlatives cross-linguistically, as noted by Ultan (1972, 123) and confirmed in my sample. Some examples are given in (74):

- (74) a. van<sup>j</sup>miz-leš<sup>j</sup>      vi<sup>j</sup> (Udmurt)  
 everything-ABL new  
 ‘newest’ (‘new than everything’) (Csúcs 1998, 286)
- b. irϕeli-ši u-ϕəra-š-i      (Mingrelian)  
 all-GEN CMPR-bad-CMPR INFL  
 ‘worst’ (‘worse than all’) (Kipshidze 1914, 34)
- c. iŋkaraka-ŋa      kŋar-alkura (Arrente)  
 everything-ABL large-CMPR  
 ‘greatest’ (‘greater than all’) (Strehlow 1942, 87)
- d. ... upkat-tuk engesi-tmer (Evenki)<sup>18</sup>  
 ... all-ABL strong-CMPR  
 ‘strongest’ (‘stronger than everybody’) (Nedjlačkov 1997, 120)

This ‘more than all’ strategy is also widely attested in languages without a morphological comparative. Representative examples from a variety of languages are given here, drawn not only from a variety of regions and genetic stocks, but also from among the various ways of representing comparison.

The Tungusic language Even has no special marker of comparison, and comparatives are formed with the positive degree of the adjective, with the standard of comparison in a locative case (ablative), as in (75a). One means of forming the superlative in this language is to use a universal quantifier in the position of the standard of comparison, as in (75b):

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<sup>18</sup>A superlative suffix *-tku* is also possible in place of *-tmer*. Bulatova and Grenoble (1999, 21) also give this with the bare adjective. Bulatova and Grenoble state that the *-tku* form is the superlative, while the comparative of positive form with the universal quantifier form “an even higher degree of the adjectival quality.” This may be what Dressler and Kiefer (1990) discuss for Hungarian and Viennese German as regards a degree beyond superlative (the best of the best). In any event, compare (74d) to the example from related Even in (75a), in which the suffix (presumably cognate to the Evenki comparative) is glossed as an intensifier, rather than a comparative. It is not clear to me whether there is a real grammatical distinction between these languages in this respect. For completeness, note also that while Nedjlačkov (1997) gives (74d) as a superlative,

- (75) a. *ŋeeluki ŋin-duk eŋi-dmer*  
 wolf.NOM dog-ABL strong-INTENS  
 ‘The wolf is much stronger than the dog.’ (Malchukov 1995, 12)
- b. *erek oran čele-duku-n gud*  
 this reindeer.NOM all-ABL-3SG high  
 ‘This reindeer is the highest (of them all).’ (Malchukov 1995, 12)

The same pattern is found in Bagri (Indo-Aryan), where an element meaning ‘more’ is optional.

- (76) a. *gita mira syũ moṭi he*  
 Gita Mira from old be-PRES.3FS  
 ‘Gita is older than Mira.’ (Gusain 2000, 38)
- b. *rajes sɛ/sara/səgla syũ kabil he*  
 Rajesh all from competent be-PRES.MS  
 ‘Rajesh is the most confident of all.’ (Gusain 2000, 38)

In Tümpisa Shoshone (Uto-Aztecan), the standard of comparison is marked by one of three postpositions, all meaning (roughly) ‘more than’, while the adjective is unmarked. In this language as well, superlatives are formed by using the word for ‘anyone/everyone’ as the standard of comparison (the order between the adjective and postpositional phrase is reported to be flexible).

- (77) a. *nüü yuhupi üng kawiki ...*  
 I fat you.OBJ more.than  
 ‘I am fatter than you.’ (Dayley 1989, 291)
- b. *satü noohakka kawu yuhupi*  
 that anyone.OBJ more.than fat  
 ‘That one is the fattest.’ (Dayley 1989, 295)

Comparatives in Rapanui, a Polynesian VSO language, are formed with the main predicate *’ilhau* ‘more’ which takes three arguments: the subject, the property or attribute being compared, in nominalized form, and then the standard of comparison, introduced by dative *ki*. A very loose paraphrase in English might be something like: ‘X is more than Y in height’ to mean ‘X is taller than Y.’ As (78) shows, the superlative is rendered via comparison to all.

- (78) 'Thau a Ari i te roa roa ki te ta'ato'a  
 more PRS Ari REL +SPE long RED DAT +SPE every  
 'Ari is the tallest.' (lit: 'taller than all') (Du Feu 1996, 73)

Zulu (Bantu) provides an example of the use of the universal quantifier as the object of the verb meaning 'surpass' to express the superlative in an 'exceed' comparative construction:

- (79) mude ukwedlula bonke esikoleni  
 he.is.tall surpass.INFIN all in.the.school  
 'He is tall above [lit. surpassing] all (others) in the school.' (Poulos and Msimang 1998, 403)

Such examples also show up in language where 'exceed' comparatives occur in verb serialization contexts. The published description of Ogbrohuagum (Bukuma), a Niger-Congo language, does not explicitly discuss superlative formation in this language, but gives the following text example, which appears to illustrate this point:

- (80) əlugulu ká-ə́rísí mú jó jóo-déeri nééma jó te  
 tortoise FACT-to.say that he FACT-know knowledge he surpass  
 ikpom ína wa  
 all animals the  
 'Tortoise said that he was the wisest of all the animals.' (Kari 2000, 53)

The strategy is even attested in juxtaposed, 'conjoined'-comparatives, as in the following example from Sinaugoro:

- (81) mota mabara-ri tu kei, avaro tu barego.  
 snake all-3PL TOP small [snake.name] TOP big  
 'Avaro is the biggest of all snakes.' [lit. 'All the snakes are small, avaro is big.'] (Tauberschmidt 1999, 38)

What is interesting about all of these examples is that the universal quantifier has the morphosyntax of the standard of comparison for the language. Literally, these correspond to 'bigger than all' and not 'biggest of all'. Russian examples draw out this difference clearly. As in English, the morphosyntax of the two constructions is different, and a phrase such as 'tallest of the

students' is rendered by the superlative form of the adjective, along with a PP expressing the comparison set, as in (82). In this sentence, it is clearly implied that Vanya is one of the students.

- (82) Vanja samyj vysokij iz student-ov.  
Vanja most tall from student-GEN.PL  
'Vanja is the tallest of the students.'

This contrasts with the construction in which the adjective stands in the comparative form, and the standard of comparison is expressed in the genitive, with no preposition (83a). In this example, as in its English translation, Vanya is being compared *to* the students, and there is a strong implication that Vanya himself is not one of the students. If Vanya is one of the students, then a contrastive word is required, as in (83b), again, just as in English.

- (83) a. Vanja vyš-e student-ov.  
Vanja tall-er student-GEN.PL  
'Vanja is taller than the students.'  
b. Vanja vyš-e drug-ix student-ov.  
Vanja tall-er other-GEN.PL student-GEN.PL  
'Vanja is taller than the other students.'

The construction with the universal quantifier in (84) clearly has the morphosyntax of the comparative, not that of the 'tallest of all' frame in (82). However, unlike (83a-b), there is no need for a separative word such as 'other' or 'else'.

- (84) Vanja vyš-e vse-x.  
Vanja tall-er all-GEN.PL  
'Vanja is the tallest.' (lit: 'Vanja is taller than everyone.')

In English, a construction of this sort occurs, most prevalently with *any*, in casual contexts, as in the following examples drawn from the Corpus of Contemporary American English (COCA).<sup>19</sup>

- (85) a. the thing that is going to guide this administration more than anything is the safety of the American people...  
b. We love two things more than anything: Family and music.

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<sup>19</sup>Searched July 2010.

- c. The smoking ban hurt more than anything...
- d. Perhaps more than any state in America, California represents the end of the rainbow.
- e. At twenty-nine, he thought he knew more than anybody.
- f. ... the former chief knew more than everyone ...

Read literally, an example like (85d) should imply that California is not an American state, or else it should be inherently contradictory: if California is an American state, then California represents the end of the rainbow more than California does. Likewise, (85f) should entail that the chief knew more than himself. As Barbara Partee notes in an informal comment on *LanguageLog* (<http://itre.cis.upenn.edu/~myl/languagelog/archives/004925.html>), it appears that in this usage, we accommodate a silent *else* or *other* in understanding these. To English ears, examples of this sort feel like an imprecision, an intuition supported by the observation that the majority of relevant *COCA* hits for “more than any/all/every(one)” have an overt contrastive word.

And yet, the cross-linguistic evidence suggests that such an accommodation is routine. The literal meaning of the construction appears to yield a contradictory entailment, particularly clear in examples like (81), which is simply ignored in interpreting these sentences.<sup>20</sup> Of the many grammatical descriptions that describe superlatives as being formed by the comparative construction with ‘all’ as the standard, only one gives an ‘other’ or ‘else’ word in describing the relevant construction, namely Nandi, an ‘exceed’-comparative language (Creider and Creider 1989, 151).<sup>21</sup> The widespread

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<sup>20</sup>This may be related to a puzzle in plural superlatives identified by Stateva (2005). Stateva noted that theories of the superlative predict a contradictory reading for (i), much as (ii) is contradictory without some special context (such as: ‘in their respective ranges’):

- i. Everest and K2 are the highest mountains.
- ii. # Everest is the highest mountain and K2 is too.

Stateva argued, in effect, for an accommodation mechanism that is similar to that needed for the ‘more than all’ examples (though she did not phrase it in these terms). See Fitzgibbons et al. (2009) for criticism of Stateva’s proposal, and an alternative account (which, so far as I can see, would leave the plural superlatives unrelated to the ‘more than all’ construction discussed in the main text).

<sup>21</sup>Compare also Lao, which forms a superlative with a word glossed ‘peer, (member of) group’ in the comparative construction (etymologically, at least an ‘exceed’-type; Enfield 2007, 257).

distribution of the ‘more than all’ superlative, across language families and more importantly, across comparative types, suggests that this accommodation strategy may be available as a part of Universal Grammar (or universal pragmatic strategies, if these are something distinct). And yet, this leaves the English situation, in which such an accommodation is not routine, as an oddity.

Stepping back from these details, there is something else at stake here, which (as noted at the outset of the discussion) may make the entire discussion beside the point for the main themes of this book, and that is the question of whether any of these examples are ‘superlatives’ in a grammatical, as opposed to functional sense (see also the remarks on the definite article in section 3.2.1). An English expression such as *John is taller than everyone else* is grammatically a comparative — there is no reason (that I know of) to suppose that its morphosyntactic or semantic representation contains any superlative element. If there is an (extra-grammatical) pragmatic accommodation at play in the ‘more than all’ type of “superlative” then it would seem that these too should be treated as grammatical comparatives. On this view, languages with only ‘more than all’-type superlatives would in fact lack superlatives as a grammatical category altogether. The examples in this section would thus be neither here nor there in their bearing on the Containment Hypothesis. It is only if these examples require a special superlative element in their representation that they would bear on the Containment Hypothesis. Either way, there is no challenge to the general thesis advanced in this chapter: the ‘more than all’ examples either support the hypothesis, or are (at worst) neutral with respect to it.

### 3.2.4 Interim Conclusion

Taking stock, thus far I have shown that nesting relations (or more complex containment structures) are plausible on cross-linguistic morphological grounds. It is crucial to the account of the CSG that these relations hold of all languages that have morphological comparative and superlative grades, and thus that they hold also of languages where the relation is not transparent on the surface. Although there is an affix-ordering wrinkle in the Fennic languages for the (stricter) Nesting Hypothesis, the more general Containment Hypothesis is consistent with a broad array of data.

### 3.3 Comparison and the Synthetic/Analytic Divide

The discussion of superlatives formed with the definite article or a universal quantifier have brought us into the realm of periphrastic expressions of the superlative. In discussing the CSG, I set these aside, noting that the scope of the CSG is limited to morphological expressions of the comparative and the superlative. In fact, even where there is suppletion in the comparative, when the superlative is periphrastic, it sometimes shares the suppletive root of the comparative (86a-b), and sometimes does not as in Tikhvin Karelian (Rjagoev 1977, 96-97) and Russian (86c-d):

(86)	POS	CMPR	SPRL	
a. M. Greek	<b>kakó-s</b>	<b>cheiró-tero-s</b>	o <b>cheiró-tero-s</b>	‘bad’
b. Votic	<b>üvä</b>	<b>parə-pi</b>	kəikkia <b>parə-pi</b>	‘good’
c. Tv Karel.	<b>hüvä</b>	<b>pare-mpi</b>	{ülen/suamo} <b>hüvä</b>	‘good’
d. Russian	<b>plox-oj</b>	<b>xuž-e</b>	samyj <b>plox-oj</b>	‘bad’

In this section, I will investigate the structure of periphrastic constructions, arguing in the first place that the limitation of the CSG, as an absolute, to morphological superlatives, has a principled basis, and that moreover, the alternation seen in (86) is a predictable consequence of the interaction of the Containment Hypothesis with the general theoretical mechanisms that derive periphrastic and morphological constructions from a single underlying syntactic representation. There are a number of steps to this argument, but along the way, I will derive and defend two further candidate universals:

- (87) The Root Suppletion Generalization (RSG)  
 Root suppletion is limited to synthetic (i.e., morphological) comparatives.
- (88) The Synthetic Superlative Generalization (SSG)  
 No language has morphological superlatives (*X-est*), but only periphrastic comparatives (*more X*).

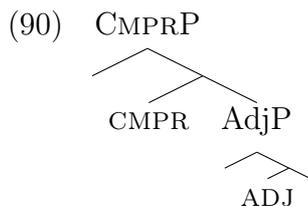
We start with a general consideration of locality in contextual allomorphy, of which suppletion is a special case.

### 3.3.1 Periphrasis, Suppletion, and Locality

As noted in the introduction, an important area of inquiry within Distributed Morphology has been on the locality of morphological interactions, such as allomorphy (see Embick 2010 for an extensive survey, and specific proposals). A morpheme (or feature)  $\beta$  may condition allomorphy for morpheme  $\alpha$  only if the two are sufficiently local. At least as a working hypothesis, assume that a head or feature that conditions root allomorphy must be in the same morphological word (complex  $X^0$ ) as the root. Put differently,  $\beta$  may condition allomorphy for  $\alpha$  in the environment in (89a) but not that in (89b), where a maximal projection intervenes (abstracting away from linear order). (An alternative formulation, in line with Embick (2010), would make reference to *phases* or *cyclic nodes*, in place of maximal projections, in (89b), although this does not differ in any way that is relevant to the present discussion, and I will make use of (89) in what follows.)

- (89) a.  $\alpha \dots ]_{X^0} \dots \beta$   
 b.  $*\alpha \dots ]_{XP} \dots \beta$

With this in mind, we turn to the morphosyntax that underlies the comparative. I assume that the morphological and syntactic comparative have the same underlying syntax, at least at an initial level of representation (D-structure in the GB framework, or its analogue in subsequent versions of the theory). Simplifying for the sake of exposition, let us assume that the syntactic structure underlying a comparative is (in part) as in (90), where a comparative head takes an adjectival phrase as its complement.<sup>22</sup>

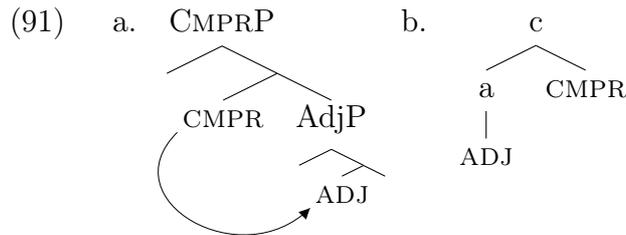


If nothing further happens, this would yield a periphrastic comparative, like *more intelligent*. A morphological comparative is derived from the structure in (90) by means of an operation M which combines the two heads. This

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<sup>22</sup>I put aside here the many interesting questions of the syntax of comparatives, on which there is a vast literature, including Bresnan (1973), von Stechow (1984), Kennedy (1997), Lechner (2004), among many others. Important in these discussions is the position of the *than*-phrase, taken to be the first sister of the CMPR head in some accounts.

operation could be head movement in syntax, or the post-syntactic operation Morphological Merger (see section 1.2). The choice does not matter at this point, and for expository convenience I will present it as Merger, a process adjoining the comparative head to the adjective as in (91a), yielding (91b) (= (37b) above).



Now, given the locality condition in (89), we make an immediate prediction. Where the structure that is subject to morphological exponence is that in (90), comparative suppletion will be blocked, but where the structure that feeds exponence is as in (91b), suppletion will be permitted (and hence required, by the Elsewhere Principle). Let's take a concrete example.

In Modern Greek, both periphrastic and (for some adjectives) morphological comparatives exist. In Greek, these two constructions are generally in free variation (as they are in English for a small class of adjectives, such as *polite* – *politer/more polite*). Modern Greek also has one suppletive adjective, *kako-s* 'bad' with comparative root *cheiro-*. Thus, we have the partial Modern Greek vocabulary in (92):

- (92) a. BAD → cheiró /      ] CMPR ]  
 b. BAD → kakó  
 c. CMPR → -tero / ]<sub>ADJ</sub>      ]  
 d. CMPR → pio

The restriction in (89) ensures that the two roots and two comparatives do not combine freely. If Merger (or head movement) applies, yielding (91b), then the affixal comparative (92c) is required, and, by the Elsewhere Principle, forces the comparative root allomorph in (92a). On the other hand, if there is no amalgamation of the two heads, and (90) is the input to the rules of exponence, then a periphrastic construction emerges. The comparative will be realized as *pio*, since it is not affixal. At the same time, the comparative allomorph of BAD in (92a) is unavailable, since the comparative element

is not within the same complex  $X^0$  as the root. The periphrastic output is necessarily *pio kako-s*, and not *\*pio cheiro-s*. The prediction of the locality condition is borne out (I include superlative forms here for reference though they are not directly relevant):

- (93)
- |    | POS           | CMPR                 | SPRL                   |       |
|----|---------------|----------------------|------------------------|-------|
| a. | <b>kakó-s</b> | <b>cheiró-tero-s</b> | o <b>cheiró-tero-s</b> | ‘bad’ |
| b. | <b>kakó-s</b> | pio <b>kakó-s</b>    | o pio <b>kakó-s</b>    | ‘bad’ |

The same is true for other languages. Whenever potentially suppletive adjectives alternate between a periphrastic and a morphological comparative, suppletion is limited to the morphological construction. Georgian provides a clear illustration, with four adjectives undergoing suppletion in morphological comparatives (three of these also have corresponding morphological superlatives, showing ABB patterns, as expected):

- (94)
- |    | POS            | CMPR                | SPRL                   |        |
|----|----------------|---------------------|------------------------|--------|
| a. | <b>k’arg-i</b> | u- <b>k’et-es-i</b> | sa-u- <b>k’et-es-o</b> | ‘good’ |
| b. | <b>k’arg-i</b> | u- <b>mjob-es-i</b> | sa-u- <b>mjob-es-o</b> | ‘good’ |
| c. | <b>cud-i</b>   | u- <b>ar-es-i</b>   |                        | ‘bad’  |
| d. | <b>cot’a</b>   | <b>nak’l-eb-i</b>   |                        | ‘few’  |
| e. | <b>bevr-i</b>  | <b>met’-i</b>       | u- <b>met’-es-i</b>    | ‘many’ |

All four adjectives also enter into periphrastic comparatives, and in each case are regular, rather than suppletive:

- (95)
- |    | POS            | CMPR                | SPRL                            |        |
|----|----------------|---------------------|---------------------------------|--------|
| a. | <b>k’arg-i</b> | upro <b>k’arg-i</b> | q’vela-ze (upro) <b>k’arg-i</b> | ‘good’ |
| b. | <b>cud-i</b>   | upro <b>cud-i</b>   | q’vela-ze (upro) <b>cud-i</b>   | ‘bad’  |
| c. | <b>cot’a</b>   | upro <b>cot’a</b>   | q’vela-ze (upro) <b>cot’a</b>   | ‘few’  |
| d. | <b>bevr-i</b>  | upro <b>bevr-i</b>  | q’vela-ze (upro) <b>bevr-i</b>  | ‘many’ |

Other than the interesting question of how circumfixes are to be modeled, the Georgian facts show the same thing as Greek. In the periphrastic construction, the comparative head is not local enough to the adjectival root to govern suppletion — a phrasal boundary intervenes.

An alternation between a regular periphrastic construction and a suppletive one is also attested in Abkhaz (Northwest Caucasian, unrelated to Georgian).<sup>23</sup>

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<sup>23</sup>These forms are from Š. K. Aristava et al. (1968, 49-50), see also Chirikba (2003, 30) (the superlative from (Hewitt 1991, 47)); the morphological alternations on the adjective

(96)	POS	CMPR	SPRL	
a.	a- <b>bzəja</b>	jejh̃a i- <b>bzəj</b> -aw	zag' ra:sta jejh̃a i- <b>bzəj</b> -aw	'good'
b.	a- <b>bzəja</b>	i- <b>jejbʰ</b> <sup>j</sup> -u		'good'

The same pattern arises in the Italian adjectives for 'good' and 'bad', given in (97), with similar patterns throughout Romance wherever a periphrastic comparative alternates with a suppletive one.

(97)	POS	CMPR	SPRL	
a.	<b>buono</b>	<b>migliore</b>	il <b>migliore</b>	'good'
b.	<b>buono</b>	più <b>buono</b>	il più <b>buono</b>	'good'
c.	<b>cattivo</b>	<b>peggiore</b>	il <b>peggiore</b>	'bad'
d.	<b>cattivo</b>	più <b>cattivo</b>	il più <b>cattivo</b>	'bad'

In some cases, the alternation between periphrastic and morphological comparatives may correlate with a meaning difference. French 'bad' (98) serves to illustrate, with the suppletive, morphological pattern used for abstract situations and the regular, periphrastic pattern for more concrete properties, according to Dietiker (1983, 104) and Judge and Healey (1983, 303):

(98)	POS	CMPR	SPRL	
a.	<b>mauvais</b>	<b>pire</b>	le <b>pire</b>	'bad' (abstract)
b.	<b>mauvais</b>	plus <b>mauvais</b>	le plus <b>mauvais</b>	'bad' (concrete)

There is thus a clear generalization to be stated here. This generalization is the Root Suppletion Generalization in (87), repeated here. As demonstrated with Greek, the RSG is simply a corollary of the locality condition in (89), applied to the structures assumed for the comparative morphosyntax in (90)-(91). Allomorphy (of which suppletion is a special case) can only be triggered within a morphological domain.

- (87) The Root Suppletion Generalization (RSG)  
 Root suppletion is limited to synthetic (i.e., morphological) comparatives.

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reflect the use of predicative forms in the comparative construction, as compared to the basic form given for the positive. I have regularized differences in transcription across sources.

What is excluded by (87), i.e., as a violation of (89), is a situation in which the comparative is formed periphrastically, with an obligatory free comparative adverb, but requires a suppletive root, a pattern as in (pseudo-)English or Greek (99):

- (99)
- |    | POS           | CMPR                  |
|----|---------------|-----------------------|
| a. | <b>good</b>   | * more <b>bett</b>    |
| b. | <b>kakó-s</b> | * pio <b>cheiró-s</b> |

Note that some care needs to be taken to distinguish the excluded, and unattested, construction type in (99) from the co-occurrence of the adverb and affix, which Cuzzolin and Lehmann (2004, 1217) describe as a means to “reinforce or strengthen” the comparative. Cuzzolin and Lehmann (2004) note that this is widespread among languages that have both analytic and synthetic comparatives. Examples of such reinforcement occur with regular (non-suppletive) adjectives, as with suppletive stems, as the following illustrate.<sup>24</sup>

- (100)
- |               | POS            | CMPR                       |          |
|---------------|----------------|----------------------------|----------|
| a. English    | <b>old</b>     | (more) <b>old-er</b>       |          |
| b.            | <b>good</b>    | (more) <b>bett-er</b>      |          |
| c. Late Latin | <b>fort-is</b> | (magis) <b>fort-ior</b>    | ‘strong’ |
| d.            | <b>bon-us</b>  | (magis) <b>mel-ior</b>     | ‘good’   |
| e. Mod. Greek | <b>mikro-s</b> | (pio) <b>mikró-tero-s</b>  | ‘small’  |
| f.            | <b>kako-s</b>  | (pio) <b>cheiró-tero-s</b> | ‘bad’    |

Such ‘reinforcement’, though proscribed in Standard English, has been attested as long as there has been a periphrastic comparative alternating with the older affixal comparative in the history of the language (Kytö and Romaine 1997, González-Díaz 2006). Formally, if Merger is treated as a lowering operation (as in 91), then reinforcement involves the redundant spell-out of the CMPR head in addition to the affixal exponent. This would limit reinforcement to affixal comparatives, excluding reinforcement of periphrastic constructions: \**more more intelligent*. Such doubling of *more* would only be possible as a type of (possibly meta-linguistic) double comparison, which the forms in (100) are not.

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<sup>24</sup>The English examples are from Kytö and Romaine (1997). The Late Latin examples are from Cuzzolin and Lehmann (2004, 1217) and the Greek from González-Díaz (2006, 726) and Holton et al. (1997, 87).

Reinforcement also occurs in (at least some of) the modern Romance languages, where only suppletive adjectives are not periphrastic (see below). Thus in Italian *più migliore* ‘more better’ is in use alongside *migliore* ‘better’.<sup>25</sup> The same is apparently true of Abaza (Tabulova 1976, 71).

In all cases, the reinforcing adverb, obligatory in true periphrastic comparatives, is optional when it occurs in the presence of a morphological comparative. This is a key factor distinguishing reinforcement from the excluded pattern in (99). In the significant majority of examples of root suppletion, the regular affixal comparative morpheme is obligatorily present (even though it is functionally redundant, as suppletion alone unambiguously signals the comparative). Yet when the comparative morpheme is free-standing, its presence is never obligatory with a suppletive root.

Before moving on, there is a final remark which could be made regarding the Modern Romance situation as regards the RSG and locality. This is somewhat of an aside, but has attracted attention in the literature, and is thus worth discussing here.

### 3.3.2 Aside: Romance suppletion and Poser blocking

At this point, let us return briefly to the Modern Romance languages, and the interaction, or rather complementarity, between periphrasis and suppletion. In the previous section, I noted that whenever there is an alternation between a periphrastic and a morphological comparative, it is only the morphological form that may be suppletive. This was stated as the RSG, and derived from the locality condition in (89), with examples from Modern Greek, Georgian, and Modern Romance languages.

An apparent challenge to this comes from a treatment of the Modern Romance languages, in particular French, in terms of what Hankamer and Mikkelsen (2005) refer to as *Poser blocking* (after Poser 1992, see also Vincent and Börjars 1996). In French, all comparatives are periphrastic, except for a small handful of suppletive forms, such as (101). Unlike, say, Greek discussed in the previous section, there are no non-suppletive, morphological comparatives in French. Moreover, for *bon* ‘good’, there is no alternation

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<sup>25</sup>For French, there may be variation, as *plus meilleure* apparently occurs, at least inasmuch as the Office québécois de la langue française devotes a page to it, with examples given, describing it as a pleonasm, rather than unacceptable, see [http://66.46.185.79/bdl/gabarit\\_bdl.asp?id=2114](http://66.46.185.79/bdl/gabarit_bdl.asp?id=2114) (September 2010), yet some speakers report it as entirely unacceptable (P. Schlenker, personal communication, 2010).

with a periphrastic construction, as there is for *mauvais* ‘bad’ (98), or for the Italian cognates in (97).<sup>26</sup>

(101)	POS	CMPR	SPRL	
	a. <b>bon</b>	<b>meilleur</b>	le <b>meilleur</b>	‘good’
	b.	*plus <b>bon</b>	*le plus <b>bon</b>	

Poser (1992) and Vincent and Börjars (1996) contend that the French example in (101) shows blocking of a phrase by a single word. Cast in realizational terms, the lexical item *meilleur* on a Poser-blocking account replaces the entire phrasal structure in (90), not just heads therein.<sup>27</sup> Poser-blocking is at odds with the locality condition in (89). In the configuration in (90), the comparative head is insufficiently local to admit of interactions of this sort with the adjective root.

While Modern French seems to display an alternation between a regular, phrasal expression and a listed, suppletive word, a broader cross-linguistic perspective shows that there are two alternations that are in play here, and that there is no compelling reason to abandon the locality condition that underlies the robust RSG (see Embick and Marantz (2008) and Embick (2007) for extensive discussion of this point, on which I draw in what follows).

The first alternation is between periphrastic and morphological comparison, independent of suppletion or irregularity. This alternation is independent of that between suppletive and non-suppletive roots, up to the RSG. This independence is clear in English (and other languages), where, when suppletion is set aside, we know that some adjectives form periphrastic comparatives, some form morphological ones, and some alternate (see section 5.5 for more discussion of the English distinction):

(102)	POS	MORPHOLOGICAL	periphrastic
	a. intelligent	*intelligent-er	more intelligent
	b. polite	polite-r	more polite
	c. smart	smart-er	* more smart

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<sup>26</sup>An apparently similar pattern arises in the Northwest Caucasian languages Abaza and Abkhaz, where regular comparatives are periphrastic but ‘good’ and ‘bad’ have suppletive forms (in Abkhaz as doublets to regular periphrastic comparatives), generally occurring without the comparative adverb (see Tabulova 1976, 71, Š. K. Aristava et al. 1968, 49-50).

<sup>27</sup>We are comparing across frameworks with differing underlying assumptions here, as Vincent and Börjars (1996) in particular adopt a lexicalist approach in which morphology does not realize syntactic structure, but is rather associated with such structure by rules. I have attempted to abstract away from this comparison in representing their approach in the main text.

Similarly, in Modern Greek, regular adjectives alternate freely among the two comparatives, as already noted:

(103)	POS	CMPR	SPRL	
	a. <b>kaló-s</b>	<b>kalfí-tero-s</b>	o <b>kalfí-tero-s</b>	‘good’
	b. <b>kaló-s</b>	pio <b>kaló-s</b>	o pio <b>kaló-s</b>	‘good’

Thus, individual grammars must allow for a determination of which adjectives are subject to Merger, whether obligatorily or optionally, and under what conditions. As the above examples show, morphological listedness (suppletion) plays no role in that alternation: both the periphrastic and morphological comparatives are regular.

The competition known as blocking arises between regular (*smart-er*) and suppletive (*bett-er*) stems, is thus a distinct alternation. Given the locality condition that derives the RSG, only the output of Merger can be the input to suppletion. Thus there is a relationship between the two alternations, but a weak one: suppletion is restricted to a subset of the roots that undergo Merger. This is patently true of the majority of languages in the survey that have periphrastic-morphological alternations and suppletion, illustrated by English and Modern Greek above, but no less true of most of Germanic, all of Slavic, Georgian, Latin, and even Old French, which had non-suppletive morphological comparatives, such as *grant* – *graindre/graignor* ‘big – bigger/bigger.OBL’ alongside suppletive *mieudre/oblique: meilleur* ‘better’ (Bauer and Slocum 2006).

In these languages, the set of adjectives that undergo suppletion is a proper subset of those that undergo Merger, in English, a small proper subset, while in Old French, there are few adjectives like *grant*. But nothing requires that the suppletive adjectives be a proper subset of those undergoing Merger, and a logical possibility is for the set of adjectives undergoing Merger to be a small set comprised solely of those that also undergo suppletion. Indeed, this is what Modern French instantiates, with a clear historical record showing the set of adjectives forming morphological comparatives declining over time until only the suppletive ones remain (Romanian has gone further, with even ‘good’ and ‘many’ becoming periphrastic only, and thus leaving no suppletion whatsoever).

In other words, the theoretical tools needed to describe French without invoking a distinct mechanism of Poser-blocking, and thereby abandoning the locality condition on morphological interactions, are independently needed for the description of languages like Greek and Georgian, discussed in the

previous section. What is special about French, on this view, is only that the set of adjectives that undergo Merger is extremely small, and coextensive with the set that also happen to undergo suppletion. This account treats it on a par with the other languages discussed in this section, and indeed, where French does show alternations, rather than competition, it does behave exactly like the other languages, with suppletion restricted to the non-periphrastic construction. The following vocabulary can be taken to underlie the French forms for ‘bad’ in (98), which alternate between periphrastic and morphological expressions depending on meaning; the derivation of the forms is in all respects exactly parallel to the Greek forms in (cf. (92)):

- (104) a. BAD → pire /  $\_\_\_$  | CMPR |  
 b. BAD → mauvais
- c. CMPR →  $\emptyset$  / ]<sub>ADJ</sub>  $\_\_\_$  |  
 d. CMPR → plus

From this perspective, the burden of proof lies squarely with those who would invoke the additional mechanism of Poser-blocking. The intuitive motivation behind such a view appears to be that French, unlike Greek, has no independently detectable comparative affix, which forms regular morphological comparatives. Perhaps there is an implicit appeal to learnability here – how could the Merger operation be acquired by the French child, if the complex morphological entity it derives (91b) is never transparently segmentable? But this is a red herring. If the locality condition in (89) is a part of UG, and thus of the innate knowledge the child brings to bear on the acquisition process, then the child learning French is forced by the overt evidence to posit the two-step derivation that is (more) transparent in other languages. Given the evidence that *meilleur* is the comparative of *bon* ‘good’, the child has no alternative but to posit root suppletion. Since suppletion is restricted to complex  $X^0$  nodes, the child must postulate an operation, such as Merger, which derives a complex  $X^0$  from the underlying syntax in (90). With no (synchronically) segmentable affix in the suppletive forms (unless the common *-r* of *meilleur, pire* permits of decomposition), the child must then treat the comparative forms as portmanteaus, for example, by means of a zero affix (as in (104c), but see section 5.3 for an alternative). There is no mystery here, nor any conspiracy, but rather a deterministic acquisition process, in fact the same process as the English child applies to *bad* – *worse*, yielding

the same grammatical representation (up to phonology) for these cases. Invoking Poser-blocking not only threatens to undermine the explanation of the RSG as a special case of the locality condition on morphological interactions (as it rejects such a condition), but it appears to require a non-uniform treatment of suppletive comparatives across languages, arguably complicating the acquisition process as against the deterministic view of acquisition incorporating (89) offered here.

Similarly, from a historical perspective, on the Poser-blocking approach, to the extent that the difference between lexical blocking (English *better* blocks *\*good-er*) and phrasal blocking is a difference in grammatical organization, then it appears that the change in the behaviour of non-suppletive adjectives in the history of French implies a reorganization of the grammar of the suppletive adjectives. By contrast, on the view advocated here, the grammatical derivation of the French suppletive comparatives never changes — *meilleur* and *pire* are derived as indicated above, by (lexically conditioned) Merger feeding contextual allomorphy of the root. What changes in the grammar of French when an adjective like *grant* ceases to form morphological comparatives is just that — the representation of that adjective changes, in that it loses the ability (for example, a diacritic [+M]) that allows it to undergo Merger. Nothing else changes as a consequence of this lexical change. Variation and gradience in the historical change are thus readily accommodated, as properties of individual lexical items. The Modern Romance situation is then merely the endpoint of a series of lexical changes, the relentless march towards regularization of the vocabulary, with Romanian (lacking suppletion entirely) at the forefront.

### 3.3.3 Periphrastic superlatives again

With the quibble about Romance comparatives resolved, we may return to the issue of periphrastic superlatives. We have seen that a basic locality condition (89) restricts allomorphy, and thus root suppletion, to local, specifically, word- (i.e.,  $X^0$ )-internal domains. This derives the RSG. This in turn now gives us a handle on the cross-linguistic variation in suppletion in periphrastic superlatives in (86) repeated here:

(105)		POS	CMPR	SPRL	
	a. M. Greek	<b>kakó-s</b>	<b>cheiró-tero-s</b>	o <b>cheiró-tero-s</b>	‘bad’
	b. Votic	<b>üvä</b>	<b>parə-pi</b>	kəikkia <b>parə-pi</b>	‘good’
	c. Tv Karel.	<b>hüvä</b>	<b>pare-mbi</b>	{ülen/suamo} <b>hüvä</b>	‘good’
	d. Russian	<b>plox-oj</b>	<b>xuž-e</b>	samyj <b>plox-oj</b>	‘bad’

In all four examples, the superlative is periphrastic. In the Modern Greek and Votic examples, the superlative inherits the suppletive root from the comparative, but in Tikhvin Karelian and Russian, it does not.<sup>28</sup> The RSG contributes to the explanation. The key observation is that the languages differ independently of suppletion as to whether the periphrastic superlative transparently embeds the comparative or not, as shown here:<sup>29</sup>

(106)		POS	CMPR	SPRL	
	a. M. Greek	<b>kaló-s</b>	<b>kalí-tero-s</b>	o <b>kalí-tero-s</b>	‘good’
	b. Veps	<b>čoma</b>	<b>čome-mb</b>	kəikid čome-mb	‘pretty’
	c. Tv. Karel.	<b>hoikku</b>		suamo <b>hoikkua</b>	‘thin’
	d. Russian	<b>sux-oj</b>	<b>suš-e</b>	samyj <b>sux-oj</b>	‘dry’

Combined with the locality restriction, the behaviour of the regular (non-suppletive) superlatives in (106) explains the suppletive patterning in (105). In the Modern Greek and Votic/Veps examples, the periphrastic superlative transparently embeds the morphological comparative; thus the comparative morpheme is sufficiently local to the adjective root to trigger allomorphy. But in the non-suppletive Tikhvin and Russian examples, the periphrastic superlative embeds the positive, not the comparative, form of the adjective. Since the comparative is thus not contained in the same word as the adjective in the superlative in these languages, the comparative root allomorph is not expected in the superlative, and suppletive allomorphy is limited to the comparative form. Generalizing: given the locality condition in (89)—the condition that derives the RSG—the CSG is predicted to hold only of those periphrastic constructions in which the superlative marker combines

<sup>28</sup>Compare also the non-suppletive periphrastic form for ‘most’ in Ludian Karelian in (170c).

<sup>29</sup>I have replaced Votic with related Veps in (106) as the sources consulted do not provide a complete paradigm for both a regular and a suppletive adjective in the nominative singular in each language. The textual descriptions indicate that they are the same as regards the points of interest. Rjagoev (1977) does not give a comparative for *hoikku*, but the superlative with *suamo* clearly lacks comparative morphology.

with a comparative adjective, and the CSG is predicted not to hold where the superlative element (appears to) select the positive form of the adjective. Not only is the restriction of the CSG to morphological forms thus not stipulated, in fact the variation in the behaviour of periphrastic constructions is predicted by the theory advanced here.<sup>30</sup> ‘many – more’) forms superlatives with elements that embed the comparative, as in *æppætu fildær*, and does not combine with *iuul*. *My thanks to B. Hettich for the Ossetian data and discussion thereof.*

Moreover, Tikhvin and Russian show the same sort of alternation discussed for Greek, Georgian and Italian in section 3.3.1. The periphrastic superlatives exist as doublets alongside morphological superlatives. But where the periphrastic constructions lack suppletion (up to reinforcement), the morphological alternants are built on the suppletive roots, as predicted, thus Tikhvin: *suamo hüvã* ~ *para-š* ‘most good ~ best’ and Russian *samyj ploxoĵ* ~ *(nai)-xud-šij* ‘most bad ~ worst’ (the morphological form being rather literary).

And yet, the success of the predictions regarding (105) raises the specter of a problem concerning the Containment Hypothesis. Why *don’t* the Tikhvin and Russian examples in (105)-(106) pattern with the Greek and Votic/Veps examples in embedding the morphological comparative? Within the general framework adopted here, if the Containment Hypothesis holds of anything, it should hold of the structure that is the input to morphology, namely, syntax, and thus its effects should be visible in both synthetic and analytic realizations of that structure. The examples in (106c-d) therefore appear to challenge the Containment Hypothesis. Ultimately, I will argue that the forms in (106c-d) do satisfy the Containment Hypothesis (by containing a ‘hidden’ comparative morpheme), and that the difference in (106) is a function of where that comparative morpheme ends up in the superlative. If it is part of morphological word containing the adjective root, we see the behaviour in (106a-b), but where the comparative is instead contained in the superlative marker, the pattern in (106c-d) emerges.

Before doing so, let us return briefly to Bulgarian and Macedonian words for ‘many’, addressed in section 4.3 as a possible problem for the CSG. The

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<sup>30</sup>In theory, this should play out internal to a single language, if (i) the language has different strategies exist for forming superlatives, some of which embed the comparative and some do not, and (ii) there are roots that undergo comparative suppletion. Ossetian is such a language, see (164) and n. 35. However, the only root that undergoes suppletion in the comparative (*biræ* – *fil-dær*

examples are repeated here.

(107)		POS	CMPR	SPRL
	a. Bulgarian:	<b>mnogo</b>	po- <b>veče</b>	naj- <b>mnogo</b>
	b. Macedonian:	<b>mnogu</b>	po- <b>veke</b>	naj- <b>mnogu</b>

In the previous discussion of these examples, I noted that, despite the orthographic practice of writing *po-* and *naj-* as prefixes, they are in fact free-standing particles, with their own stress and able to modify full phrases. This resolves the problem as far as the CSG is concerned — in the superlatives, there is a phrasal boundary between the superlative marker and the root, and thus suppletion is not conditioned. But the solution to the CSG now shifts the problem to the RSG. If *po-*, like *naj-* is separated from the root by a phrasal boundary, then it too should fail to trigger root suppletion, yet there is clearly suppletion in the comparative forms in (107).

I tentatively suggest that despite appearances it is not the element *po-* that triggers the suppletion in the comparative root, but rather a (synchronically null) comparative affix. This suggestion recapitulates the history of the aberrant nature of Bulgarian and Macedonian comparatives within Slavic. In all other Slavic languages, including Old Bulgarian up to about the 14th Century (Reiter 1979, 21), the comparative is formed by means of a suffix, typically *-ji-* or *-ši-* or derivatives thereof. The prefix *po-* occurs across Slavic with a weakening or reinforcing function, similar to English *rather* or *somewhat*, as, for example, Russian: *po-molož-e* ‘(somewhat) younger’ < *molož-e* ‘younger’, comparative of *molod-oj* ‘young’. Across Slavic, *po-* may occur with positive and comparative forms (though not both in all languages; see Reiter 1979, 22-25), and Reiter notes that both are attested in Bulgarian in the Middle Ages:

(108)	a.	po-chraber	ot	tebe	
		PO-brave	from	you.SG	
		‘braver than you.’			
	b.	koja	est	ot	vas ... po-lěp-š-aa
		which is	from	you.PL	PO-beautiful-CMPR-INFL
		‘which is more beautiful than you.’			

Alone in Bulgarian-Macedonian was the original comparative suffix lost, and concomitantly, in a manner reminiscent of the Jespersen cycle of negation, the erstwhile optional reinforcer *po-* became effectively obligatory as the

sole overt marker of comparison. The analysis of Bulgarian-Macedonian here treats this as the loss of the overt exponent of the comparative, with a zero affix retained abstractly. Note that zero-marked comparatives are possible at least in some varieties of Bulgarian; Reiter cites the following from the Šumen dialect:

- (109) toj e chubav ot mene  
 he is handsome from me  
 ‘He is handsomer than me.’ (Reiter 1979, 23)

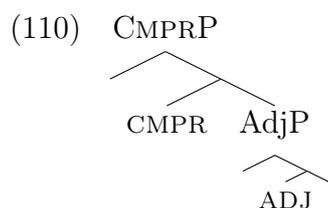
Positing a null comparative suffix, with overt *po-* merely in a reinforcing function (as in all other Slavic languages) thus permits the solution to Bulgarian-Macedonian offered earlier to be maintained, without compromising the RSG. It is the null affix that governs suppletion in the comparative; the elements *po-* and *naj-* are phrasal, and too remote (structurally) from the root to interact with. As always, extra pleading is needed in the postulation of invisible elements, yet here the historical justification, if not the synchronic one, seems well established.

### 3.4 The Synthetic Superlative Generalization

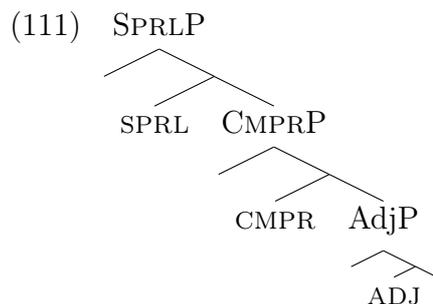
In the preceding section, I showed that the adoption of a relatively innocuous looking locality condition derives an apparently valid universal about the independence of root suppletion and periphrasis. I showed moreover that this condition interacts with different types of periphrastic superlative formation to determine whether comparative suppletion will extend to periphrastic superlatives or not, in any given language. The account was incomplete, and it is time to look in more detail at the derivation of superlatives. In doing so, we will develop a preliminary typology of superlative constructions, for which all of the basic theoretical possibilities are instantiated. In addition, we will derive another universal, namely, the Synthetic Superlative Generalization, given in (88). This generalization is almost entirely borne out by the data in this study, with a handful of potentially problematic cases, none of which looks to be a compelling counter-example; I return to these at the end of the section.

- (88) The Synthetic Superlative Generalization (SSG)  
 No language has morphological superlatives (*X-est*), but only periphrastic comparatives (*more X*).

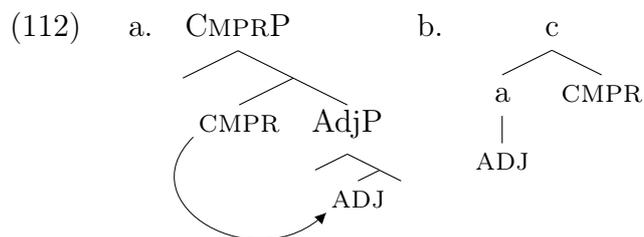
A priori, the SSG is not predicted in any obvious way under theories in which the superlative and comparative are merely two types of degree head, which can combine with adjectives (though it may be stipulated, for example, as part of a markedness hierarchy).<sup>31</sup> On the other hand, the SSG may follow from the Containment Hypothesis, on relatively straightforward (though not wholly innocuous) assumptions. One way of thinking about this is as follows. Assume the syntactic structure underlying a comparative is (in part) as in (90), repeated here as (110), where a comparative head takes an adjectival phrase as its complement.



Under the Containment Hypothesis, the superlative properly embeds the comparative, thus (111):



As noted above, morphological comparatives are modeled by application of Merger, which combines the two heads, as in (91), repeated here as (112).



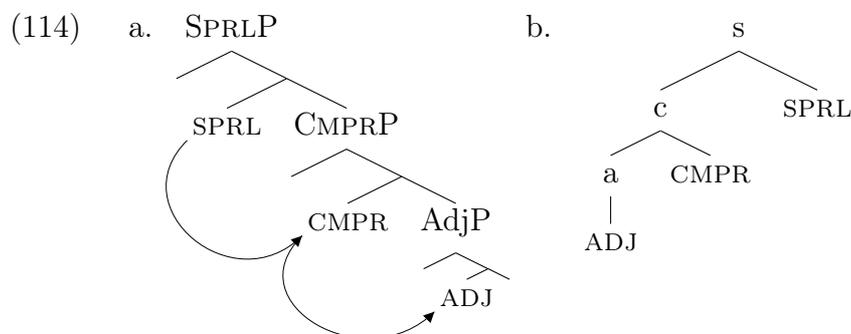

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<sup>31</sup>As noted elsewhere, Greenberg (1966), Canger (1966), Ultan (1972) propose the markedness hierarchy positive < comparative < superlative, which may imply the inventory universal in (88), although the authors cited do not note or explore this implication.

As a matter of observation, Merger is available in some languages, though often, as in English, subject to constraints that restrict its application to certain classes of adjectives. In other languages, such as Romanian, Albanian and Turkish, Merger is evidently unavailable, inasmuch as these languages exclusively permit periphrastic comparatives; even commonly suppletive adjectives such as GOOD and MANY are entirely regular in these languages:

(113)		POS	CMPR	
	a. Romanian	<b>mult</b>	mai <b>mult</b>	‘many’
	b. Albanian	i <b>mirë</b>	më <b>mirë</b>	‘good’
	c. Turkish	<b>iyi</b>	daha <b>iyi</b>	‘good’

Now, a morphological superlative, under the containment hypothesis, must be derived by successive operations of Merger, as in (114a), yielding the morphological object (114b). This is the basic structure of morphological superlatives underlying the theory presented in the previous chapter. The morphological output of this derivation (114b) corresponds to the forms with transparent morphological embedding as in (59). For languages with a null allomorph of the comparative (see (42) in chapter 2), this same derivation yields morphological superlatives of the English *long-est* type.



The SSG is derived if a language that lacks Merger in the comparative structure (110), also lacks Merger whenever that structure is further embedded, as in (111). A further assumption is that Merger cannot skip intervening heads (this is part of the definition of Morphological Merger in Marantz 1989). Recall from above that an alternative to Merger for all of these structures is head movement in the syntax. Analogous considerations apply if head movement is the device of choice for deriving morphological comparatives and superlatives; the SSG is derived if head movement must be successive

cyclic and cannot skip intervening heads (see deMena Travis 1984 and much subsequent work).<sup>32</sup> Under these assumptions, a morphological superlative will only be possible when the operation that creates morphological comparatives is also possible. A language lacking (112) must also lack (114). As expected, languages with exclusively periphrastic comparatives have exclusively periphrastic superlatives:

(115)		POS	CMPR		
	a. Romanian	<b>mult</b>	mai <b>mult</b>	cel mai mult	‘many’
	b. Albanian	i <b>mirë</b>	më i <b>mirë</b>	shumë i <b>mirë</b>	‘good’
	c. Turkish	<b>iyi</b>	daha <b>iyi</b>	en <b>iyi</b>	‘good’

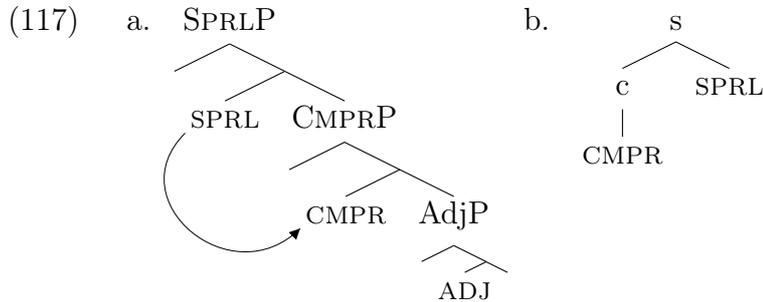
Fully periphrastic constructions like that in Romanian, matching up to (111) with no movement, are also attested in the other Modern Romance languages, as well as (Modern) Greek and Georgian (in the latter two, the periphrastic comparative alternates with a morphological comparative, at least for some lexemes; we return presently to the less transparent cases such as Turkish):

(116)		POS	CMPR	SPRL	
	a. French:	<b>gros</b>	plus <b>gros</b>	le plus gros	‘big’
	b. Greek:	psilós	pio psilós	o pio psilós	‘tall’
	c. Georgian:	<b>lamaz-i</b>	upro <b>lamaz-i</b>	q’vela-ze upro <b>lamaz-i</b>	‘beautiful’

Now, it is also theoretically possible for the superlative marker to be an affix, even where the comparative is not. Yet given the derivation of the SSG above, the only way for this state of affairs to arise is the superlative attaches not to the adjective, but to the (otherwise free) comparative morpheme. The relevant derivation is given in (117a).

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<sup>32</sup>Bobaljik (1995) argues for an antilocality constraint prohibiting syntactic movement of a head to the next head up (that is, prohibiting movement of Y to X in the structure [ $XP$  X [ $YP$  Y ]], but permitting that movement as a step in a longer chain of movement. The proposal is used to account for patterns of verb movement in the Germanic languages (Bobaljik and Thráinsson 1998, Bobaljik 2002b). If that proposal is correct, then affixation in comparative structures (91) must be achieved by Morphological Merger, rather than by syntactic head movement. See also Embick and Noyer (1999) for related discussion.



This derivation is characteristic of one superlative-forming strategy in the Slavic languages. In Slovenian, for example, as in English, not all gradable adjectives permit of a morphological comparative formation, and some adjectives form only periphrastic comparatives. The superlative is formed in all instances with the prefix *naj-*. For morphological comparatives, the prefix attaches directly to the comparative adjective, following the derivation in (114), but for periphrastic comparatives, the prefix attaches to the comparative adverb *bolj*, reflecting the derivation in (117). Illustrative examples of the two patterns are given in (118) (from Herrity 2000, 81-85):

(118)		‘weak’	‘healthy’
	positive	slab	zdrav
	comparative	slab-ši	bolj zdrav
	superlative	naj-slab-ši	naj-bolj zdrav

Another language which may have derivations of this type is Sinhalese. (Garusinghe 1962, 43) gives the following, noting that the comparative is formed periphrastically (with *vāḍā*), and the superlative may be formed from this by adding the emphatic particle *-ma*.<sup>33</sup>

(119)	a	hoñda	lámayā	‘the good boy’
	b	vāḍā	hoñda lámayā	‘the better boy’
	c	vāḍā-ma	hoñda lámayā	‘the best boy’
		MORE-EMPH	good boy	

The derivation in (117) could also underlie periphrastic superlatives where the appears to be a superlative adverb or particle that combines directly

<sup>33</sup>The particle *-ma* appears to be a clitic, sometimes written together with its host and sometimes not. Superlatives may also be formed without *vāḍā*, in which case the particle follows the adjective; the particle may also follow the noun in some contexts.

with the positive form of the adjective. For example, English *most* could be (and probably should be) treated as an amalgam of the comparative and superlative heads (that is, *most* contains *more* and is thus derived as in (117)). Turkish is another case in point, with comparative and superlative adverbs (in Modern Turkish, all comparatives and superlatives are formed periphrastically). This pattern is consistent with the containment hypothesis, if, as just suggested for English *most*, Turkish *en* can be analyzed as a portmanteau morpheme, realizing the comparative and superlative heads in (114). Given the locality condition discussed above, positing that the apparent superlative adverbs are portmanteaus of [SPRL + CMPR] requires that these heads be combined, prior to exponence, exactly as in (117)).

(120)		‘tall’	‘bad’
	positive	uzun	kötü
	comparative	daha uzun	daha kötü
	superlative	en uzun	en kötü

Returning to morphological comparatives, nothing said to this point forces a language with morphological comparatives to have morphological superlatives. Another way that the structure in (111) may be spelled out is for Merger to apply only between the comparative morpheme and the adjective, with the superlative expressed as a free-standing element. We have seen examples of this type above, for example Modern Greek and Livonian (121a-b), which form the superlative by means of a definite article or demonstrative, or any of the many languages in which the superlative is formed with a universal quantifier, as is possible in Veps (c) and Evenki (d):<sup>34</sup> These examples may correspond to a derivation in which the superlative embeds the comparative, but only the lower step of movement/merger applies.

(121)		POS	CMPR	SPRL	
	a. Greek	<b>psiló-s</b>	<b>psiló-teros</b>	o <b>psiló-teros</b>	‘tall’
	b. Livonian	vanā	vanīm	se vanīm	‘old’
	c. Veps:	<b>čoma</b>	<b>čome-mb</b>	keikiš <b>čome-mb</b>	‘beautiful’
	d. Evenki:	<b>engesi</b>	<b>engesi-tmer</b>	upkat-tuk <b>engesi-tmer</b>	‘strong’

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<sup>34</sup>Hewitt (1995, 49) gives this pattern exists in Georgian as well, alongside a periphrastic superlative, while L. Nash (personal communication, 2010) and Aronson (1989) suggest that *u-...-es* only form comparatives for a handful of suppletive forms, with *ulamazasi* having only a relative / absolute superlative sense. These examples are only relevant if these constructions involve a superlative head or projection; see section 3.2.3 for discussion.

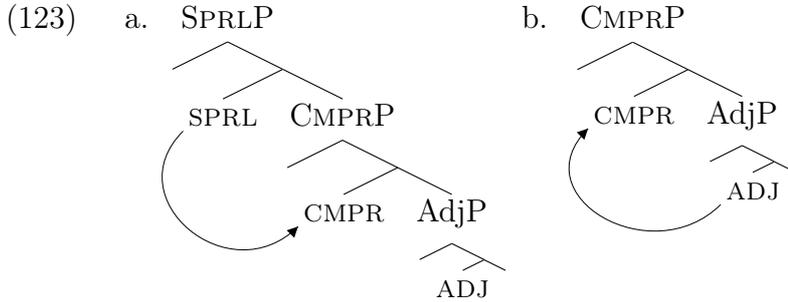
A final possibility, and perhaps the least obvious, is another type of situation in which comparatives are morphological, but superlatives are periphrastic (as in (121) above), but in which, unlike (121), the superlative does not embed the overt morphology of the comparative. This is the situation discussed above in reference to Tikhvin and Russian in (106c-d)), bringing us back to the beginning of this chapter. Some examples of this pattern are given in (122). Note that in some of these languages, the pattern illustrated is not the only one - in some cases there is a morphological comparative in addition, or a variety of means of forming superlatives.<sup>35</sup>

(122)	POS	CMPR	SPRL	
a. Russian:	<b>prost-oj</b>	<b>prošč-e</b>	samyj <b>prost-oj</b>	‘simple’
b. Ossetian:	<b>bærzond</b>	<b>bærzond-dær</b>	iuul <b>bærzond</b>	‘high’
c. Udmurt:	<b>kuž<sup>j</sup></b>	<b>kuž<sup>j</sup>-ges</b>	tuž <b>kuž<sup>j</sup></b>	‘long’
d. Chuvash:	<b>layăχ</b>	<b>layăχ-raχ</b>	či <b>layăχ</b>	‘good’
e. Arrente:	<b>tjenja</b>	<b>tjenj-ulkura</b>	<b>tjenj</b> indora	‘tall’

In line with the assumptions made above, the most straightforward analysis of these examples would be to assume that the words meaning ‘most’ have the morphosyntax of their counterparts in English. That is, they reflect portmanteaus of the comparative and superlative heads, derived as in (117), repeated below as (123a).<sup>36</sup> These languages differ, though, from the pattern in (120) in that the comparative, when it does not combine with the superlative, combines with the adjective (as in (91) = (123b)), yielding a morphological comparative form. This paradigm is interesting, since it indicates that, while a language cannot have Merger in (91) in superlatives if that operation is not available in comparatives generally, the reverse does not hold — a language may allow Merger in comparatives generally, yet opt for a different pattern (namely (117)) when the comparative subtree is embedded under a superlative. That was somewhat of a mouthful, and is schematized in (123):

<sup>35</sup>The Ossetian example is from (Abaev 1964, 20); (Isaev 1966, 243) notes that among superlative-forming elements, only *iuul* embeds the positive, others embed the comparative. The *st~šč* alternation in the Russian root is phonological, not suppletive. The Arrente example may not belong in this list. It is not clear from the description (i) whether *indora* marks an absolute or a relative superlative, and (ii) whether the affix versus free-standing distinction made by Strehlow is a genuinely sharp grammatical distinction.

<sup>36</sup>The locality condition in (89) precludes in particular positing a zero allomorph of the comparative as an affix on the adjectives, extending the analysis in (42) in chapter 2. Since the superlative is periphrastic, it would not be local enough to govern such allomorphy.



Though the analogy may prove spurious, there is at least one widely discussed precedent for derivations along these lines, where a given functional element (or feature) undergoes movement to a higher position in some configurations, but otherwise surfaces as an affix on the head of its complement. At least to a first approximation, this parallels the classic Affix-Hopping analysis of English inflection Chomsky (1957) (recast in the framework of Distributed Morphology in Halle and Marantz 1993, Bobaljik 2002a). In that analysis, English finite inflectional morphology originates in a functional projection above the verb. In inversion contexts, such as interrogatives, inflection raises to the C (COMP) position, and the verb is in its bare form (cf. (123a), spelled out as inflected *do*). When there is no inversion, the inflectional morphology ‘lowers’ to the verb (by Morphological Merger, in Halle and Marantz 1993, Bobaljik 2002a), as in (123b).

Coming back to the comparatives, the proposed derivational pairing in (123) for languages with the pattern in (122) adds the final point to the discussion of the interaction of periphrasis and the CSG, with which we ended section 3.3. In that section, I noted a split among periphrastic superlatives, where a suppletive comparative allomorph sometimes was, and sometimes was not, carried over to a periphrastic superlative. The representative pairs are repeated here:

(124)	POS	CMPR	SPRL	
a. M. Greek	<b>kakó</b> -s	<b>cheiró</b> -tero	o <b>cheiró</b> -tero-s	‘bad’
b. Votic	<b>üvä</b>	<b>parə</b> -pi	käikkia <b>parə</b> -pi	‘good’
c. Tv Karel.	<b>hüvä</b>	<b>pare</b> -mbi	{ülen/suamo} <b>hüvä</b>	‘good’
d. Russian	<b>plox</b> -oj	<b>xuž</b> -e	samyj <b>plox</b> -oj	‘bad’

In section 3.3, I noted that the difference was derivative of an independent difference, namely, whether the periphrastic superlative transparently

embeds a morphological comparative as its complement or not. The discussion above contributes the explicit derivations that underlie that difference. When the morphological comparative head surfaces on the adjective, the derivation is that in (112), embedded under a superlative, and the comparative head is local enough to the adjectival root that it governs suppletion. The derivation of (124c-d) by contrast is that in (123a). The comparative head, as in (117) is combined with the superlative, and thus is not in the same local domain as the adjective root and fails to govern suppletion.<sup>37</sup>

### 3.4.1 Armenian superlatives

Finally, I return to the question of apparent counter-examples to the SSG. The main case to consider here is from Modern Western Armenian. Sporadic descriptions in the literature suggest some other cases deserving of further scrutiny, but none of these are clear-cut, convincing cases of languages with regular affixal superlatives cooccurring with uniquely periphrastic comparatives.<sup>38</sup> It should be kept in mind on the one hand that the SSG is indepen-

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<sup>37</sup>An issue here (raised by G. Corbett, personal communication) is why the Russian adjective meaning ‘good’ alone permits both the positive and the long form (declinable) comparative in the periphrastic superlative, as shown in (i):

i.	POS	CMPR	SPRL	
a.	<b>xoroš-ij</b>	<b>luč-še</b>	samyj <b>xoroš-ij</b>	‘good’
b.		/ <b>luč-š-ij</b>	samyj <b>luč-š-ij</b>	

I suspect that the reason is that *luč-š-ij* alone among the four declinable comparatives can also be used on its own as a superlative (Garde 1998, 238) (discounting fixed expressions). If correct, then (ia) is the true periphrastic superlative, parallel to (124d) and all regular adjectives, while (ib) represents a vestigial morphological superlative, with *samyj* here in a reinforcing function, as discussed for Romance comparatives in section 3.3.2.

<sup>38</sup>In Classical Nahuatl, one of the adverbial modifiers that marks the superlative incorporates, but none of the comparative intensifiers do, see Andrews (1975, 563-566). From the description, however, this appears to be an intensifier, marking primarily an absolute superlative and hence beside the point. This may also be true of the Zulu suffix *-kazi*, cited briefly in Poulos and Msimang (1998, 403) as an alternative to the regular means of forming a superlative meaning via an exceed comparative as shown in (79). Poulos and Msimang do not discuss whether *-kazi* forms primarily relative or absolute superlatives, although the example they give is glossed as ‘He is the tallest in the school.’ The description of Paiwan in Egli (1990), mentioned above, gives comparatives formed with the free-standing particle *tja* preceding the adjective, and superlatives formed with the circumfix *tjala-...-an*. The criteria for treating the *tjala* portion as a prefix, rather than a particle, are not clear from the description; note in particular that the *tjala* portion

dent of suppletion, and therefore holds over a much wider range of languages than the CSG. On the other hand, it should also be remembered that here, as throughout, the SSG ranges over relative superlatives; absolute superlatives are frequently morphological, with no relation to the expression of the comparative, as, for example, in the Modern Romance languages.<sup>39</sup>

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of the superlative appears to consist of an emphatic element *-la-* that also occurs in the other superlative formative *ka-la...-an*. Note also short the descriptions of Koryak and Alutor in (Zhukova 1968b, 277), (Zhukova 1968a, 299), which give a zero-marked standard comparative construction for predicate adjectives, as Koryak: *konja qoja-k nə-mejəŋ-qin* = horse reindeer-LOC INFL-big-3SG ‘A horse is bigger than a reindeer (lit: at a reindeer big)’, but a circumfixal superlative *ənan-majjə-čhən* ‘biggest’ among a list of intensified adjectival forms. But the longer description of Koryak in Zhukova (1972) gives the missing intermediate forms: the suffix *-čhən* forms comparatives, such as *əppulju-čhən* ‘smaller’ (root: *əppulju-* ‘small’) from which the superlatives are derived by the intensifying prefix *ənan-* (compare Chukchi in (59h)). The SSG violation is only an artefact of the brief description.

Adam Albright points out (personal communication 2008) that some adjectives in English seem to enter into morphological superlative formation, but are strikingly awkward in a morphological comparative: *?supremest - ?\*supremer*, *?sublimest - ?\*sublimer*, *?alertest - ?\*alterter*. Judgments are slippery here (see Arnold Zwicky’s discussion at: <http://languagelog.ldc.upenn.edu/nll/?p=1923>), and the comparative forms are attested. Here again, the relative vs. absolute superlative distinction is probably important (even if not always sharp). Consider the apparent SSG-violating *mere - \*merer - merest* mentioned by a commenter on the *LanguageLog* post cited; the counter-example is only apparent, as the meaning of *mere* is not gradable, and *merest* is clearly only an absolute, not relative, superlative in meaning. So also *darn(ed) - \*darned-er - darnedest*, as in the outmoded cliché *Children say the darnedest things*, which again has only an absolute, not a relative, reading. Note, though, forms such as *winningest* versus *\*winner (than)*, which does appear to have a superlative usage, in particular in sporting contexts, as in: “The winningest coach in Division I history is hearing Geno Auriemma’s footsteps loud and clear.” (*Hartford Courant*, 9 April 2003).

<sup>39</sup>Throughout this work, I have limited the scope of the investigation to adjectival gradation. In some languages, the comparative and/or superlative morphology can combine with other parts of speech, including spatial expressions such as adverbs or adpositions. The SSG, at least as phrased in (88a), appears not to hold of this domain; thus English *top - topmost*, *left - leftmost*, etc., likewise Hungarian *alsó - leg-alsó* ‘down’ – ‘bottommost’. Note however that in this type of formation, there appears to be no corresponding comparative at all, neither affixal nor periphrastic: *\*topper*, *\*topmore*, *\*more top*, and thus these are consistent with the formulation of the SSG in (88b). In (Modern) English, where there is an apparently comparative form of the preposition/adverb, the nesting structure occurs: *upper - uppermost*; though in such cases, only the comparative and superlative forms can be used as pre-nominal modifiers: *the upper(most) reaches of the river* vs. *\*the up reaches of the river*. I put the use of apparent comparative and superlative morphology with adpositions and locational expressions aside, noting that there are interesting ques-

In Classical Armenian, the suffix *-goin* was added to adjectives to mark the comparative. In Middle Armenian, this was replaced by a periphrastic construction *ail* + ADJ Karst (1901, 394), although as late as the 19th century it was reported that the suffixal comparatives are “occasionally met with” (Riggs 1856, 19). In Modern (Western) Armenian the comparative can be formed periphrastically, and there is no (overt) affix that attaches to adjectives to yield a comparative form. The superlative is generally formed periphrastically, with the adverb *amen-e-n* ‘all-ABL’, as in (125), (see also (166b) in section 4.3).

(125)	POS	CMPR	SPRL	
	<b>partsrahasag</b>	(aveli) <b>partsrahasag</b>	amenen <b>partsrahasag</b>	‘tall’

However, there are also two options described in modern grammars as affixal. One is the a prefixed form of the quantifier *amen-a-* and the other is the suffix *-kujn*, descendant of the classical comparative suffix (homophonous with the word for ‘colour’), as in *lav-a-kujn*, ‘best’, from *lav* ‘good’ (H. Khanjian, personal communication 2010, see also Bardakjian and Vaux 2001; Modern Eastern Armenian has analogous comparatives and employs the *amen-a-* construction for superlatives, see Kozintseva 1995, 10-11 and Dum-Tragut 2009). Described in these terms, Modern Armenian poses a potential counter-example to the SSG, with affixal superlatives, but apparently no affixal comparative.

But the counter-example may well be only apparent, with at least two analyses presenting themselves. I will discuss both here, remaining agnostic however about which (if either) of these is correct.

In the first place, in the discussion of the Armenian superlatives in section 4.3, I noted that the putative ‘prefix’ *amen-a* bears the linking vowel characteristic of a compound structure, and that compounds do not count as local morphological domains in terms of the ability of the non-head element to govern suppletion on the head. The element *a-kujn*, which is moreover reportedly rather unproductive, also appears to have a compound structure (compare compounds in which it serves as a colour term: *vard-a-guyn* ‘rose-LV-colour’ = ‘pink’ Dum-Tragut 2009, 673). If these are compounds, rather than affixes, then they may not count as affixal superlatives for the purposes of the SSG, and thus not as problems .

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tions to be investigated in this area. On the history and origin of the English suffix *most*, see the entry for this affix in the *OED*.

If we lay the compounding question aside, there is another reason that it is not clear that the Armenian examples would count as problems for the SSG. This second reason is worth discussing in some detail (even if ultimately inconclusively) as it connects to a point of current debate in the semantic literature. In Modern (Western and Eastern) Armenian, the comparative is described (Bardakjian and Vaux 2001, Kozintseva 1995) as periphrastic, formed with the adverb *aveli* ‘more’ and a standard in the ablative case, as in (126).<sup>40</sup>

- (126) a. *es qezme’ aweli mec’ em*  
 I you.SG.ABL more big BE.1SG.PRES  
 ‘I am bigger than you.’ (Bardakjian and Vaux 2001, 121)
- b. *Artak-ə Bagrat-e-n aveli partsrahasag e*  
 Artak-DEF Bagrat-ABL-DEF more tall BE.3SG.PRES  
 ‘Artak is taller than Bagrat.’

On the other hand, as in a number of other languages, the adverb meaning ‘more’ is optional here, and comparatives may consist simply of the unmarked, positive form of the adjective together with the ablative-marked standard (Riggs 1856, 19), as in (127):

- (127) a. *qezme’ mec’ em*  
 you.SG.ABL big BE.1SG.PRES  
 ‘I am bigger than you. (lit: ‘I am big from you.’) (Bardakjian and Vaux 2001, 121)
- b. *Artak-ə Bagrat-e-n partsrahasag e*  
 Artak-DEF Bagrat-ABL-DEF tall BE.3SG.PRES  
 ‘Artak is taller than Bagrat.’

So the question of whether Armenian constitutes a genuine counter-example to the SSG hangs on whether (127) is a ‘synthetic comparative’ in the relevant sense, for example with a phonologically null, affixal, exponent of the comparative. If it is, then (127) has the structure in (90) and Modern Armenian is consistent with the SSG after all. The optional element *aveli* might then involve reinforcement (see section 3.3.2). The superlative

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<sup>40</sup>For extensive help with the Armenian data, I thank H. Khanjian, and for his assistance in collecting and analyzing this with respect to the theory in Beck et al. (2009), I my thanks to I.-T. C. Hsieh.

would in turn be built on this structure, just as the superlative contained a concealed comparative structure in English, for which a null allomorph of the comparative morpheme, was posited in (42). For English, the null allomorph was a theoretical device that allowed for the nesting pattern to be present in English as well, even though the comparative is not visible on the surface. The only difference between English and Armenian in these terms is that the zero affix would be the only (affixal) exponent of the comparative in Armenian, where it is a contextually restricted allomorph thereof in English.

In fact, null comparative morphemes have been considered for languages that use the strategy in (127) at least since Ultan (1972, 127). The most thoroughly investigated of such languages is Japanese, which forms comparatives with no overt marking of the adjective (neither affixal nor periphrastic), as shown in (128).

- (128) nihon-go-wa                      doits-go                      yori muzukashi  
       japanese-language-NOM german-language from difficult  
       ‘Japanese is more difficult than German.’ (Kennedy 2007a, 2)

The proper semantic (and thus syntactic) analysis of Japanese comparatives is the matter of no small debate (see Ishii 1991, Beck et al. 2004, Kennedy 2007a, Oda 2008, Beck et al. 2009). Center stage in the debate is not just the obvious morphological difference, but a host of syntactic and semantic differences between comparative constructions in the two languages, such as whether the language allows ‘comparative subdeletion’ (*The shelf is taller than the door is wide.*) and others (see Beck et al. 2009 for the broadest current cross-linguistic investigation of semantic variation in comparative constructions). Of current relevance is that proponents of both poles of the debate posit a null comparative morpheme in Japanese, which combines with the adjective (Beck et al. 2004 versus Kennedy 2007a); the differences among the approaches lie in the semantics assigned to this element and in how it interacts with the semantics of the language more broadly.<sup>41</sup> For

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<sup>41</sup>Oda (2008), developing a refinement of the proposal in Beck et al. (2004), posits no comparative head in the syntax for Japanese. However, what Oda proposes is that the comparative element is included in the representation of all adjectives in Japanese in the lexicon. What Japanese lacks, in her view, is positive forms of gradable adjectives — they are always comparative. If this analysis is correct then a language of the sort she envisages has ‘morphological comparatives’ by definition and will thus always satisfy the SSG (although note that structure-building in the lexicon is at face value incompatible with the general theoretical framework adopted here). For a proposal rejecting a null

example, Kennedy (2007a) explicitly considers, and rejects, the possibility that Japanese could lack a comparative morpheme, relying on ‘implicit comparison’ to exploit the inherent vagueness of gradable adjectives to achieve comparative-like readings in the appropriate contexts.

A preliminary attempt to investigate in more detail the relevant properties of Armenian suggests that it patterns in relevant respects like the languages that Beck et al. (2009) treat as having a null comparative affix.<sup>42</sup> For example, Armenian shows what Kennedy refers to as crisp judgments. For example, as in English, a comparative like *Michael is taller than Hillary* does not imply the positive *Michael is tall*. The same is true in Armenian — example (129b) can be judged true even in a context where (129a) is judged false (for example, where both men are short). What makes this observation interesting is that the Armenian sentence in (129b) has this property even without the adverb *aveli* ‘more’. This behaviour contrasts with Motu, a language that uses a conjoined comparative strategy, as described in Beck et al. (2009).

- (129) a. Artak-ə partsrahasag e  
 Artak-DEF tall BE.3SG.PRES  
 ‘Artak is tall.’
- b. Artak-ə Bagrat-e-n (aveli) partsrahasag e  
 Artak-DEF Bagrat-ABL-DEF more tall BE.3SG.PRES  
 ‘Artak is taller than Bagrat.’

Another property that Beck et al. (2009) take to diagnose a true comparative structure, with an operator over degrees, is the ability to take a measure phrase, specifying the differential between two objects in a comparative construction. This too Armenian allows with or without the overt marker *aveli*.

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comparative in Japanese, see the response to Beck et al. (2004) in Hayashishita (2009)

<sup>42</sup>Although Armenian shows unambiguous evidence of degree semantics, in Beck et al.’s terms, it should also be noted that Armenian shows a mix of properties relative to their other two parameters, which on their theory should not be allowed. For what Beck et al. term Degree Abstraction, Armenian appears to permit scope interactions with a degree operator (see note 43), but also appears to lack negative island effects in comparatives, two properties which should not combine. Similarly, for their Degree Phrase parameter, Armenian appears to allow subcomparatives, but lacks measure phrases with positive, non-comparative, adjectives. Exploring Armenian and its theoretical implications in greater detail are left for future research.

- (130) Artak-ə Bagrat-e-n jergu santim (aveli) partsrahasag  
 Artak-DEF Bagrat-ABL-DEF two cm. more tall  
 e  
 BE.3SG.PRES  
 ‘Artak is 2cm taller than Bagrat.’

In other properties as well, Armenian seems to pattern with languages that are analyzed elsewhere in the literature, on semantic grounds, as requiring a comparative degree operator, which must therefore be a null element in the sentences lacking *aveli*.<sup>43</sup>

Although this discussion has been tentative, if a null comparative affix is indeed motivated for Armenian, then the language is not in violation of the SSG. It does have affixal comparatives after all, the affix being simply inaudible. What the SSG disallows, as stated above, is a language with a morphological superlative and *only* periphrastic means of forming comparatives.

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<sup>43</sup>A rather complex, but much-discussed example of this sort involves apparent scope interactions between the comparative operator and modals, and is given in (43), from Heim (2000). The second sentence is ambiguous as regards the length requirement: one reading holds the requirement for the final paper to be [exactly 5 pages longer than 10 pages], i.e., the paper must be [exactly 15 pages long]; neither longer nor shorter papers will be accepted.

- i. This draft is 10 pages long. The (final) paper is required to be exactly 5 pages longer than that.

The other, more subtle reading, is somewhat harder to paraphrase, but amounts to something like: (exactly) 15 pages is the required number of pages. The logical form for this reading, treating it as a scope ambiguity involving the comparative operator, allows [exactly 5 pages longer than that] to set only a minimal requirement on page length — a 14 page paper will not be accepted, but a 20 page paper will be. Preliminary investigation suggests that even in such cases, Armenian might pattern with English in the readings allowed, to the extent that (ib) is also ambiguous, even without *aveli*, in the same way as English (43).

- i. a. as hotvadz-ə das-ə etš e/uni  
 this article-DEF 10-DEF page be/have.3SG  
 ‘This draft is 10 pages (long).’  
 b. vertšnagan hotvadz-ə bedk-e džišt hing etš-e-n aveli əlla  
 final article-DEF must-be exactly five page-ABL-DEF more BE.3.SG  
 ‘The final paper must be exactly 5 pages longer than that.’

Armenian is not such a language, nor is any other that I have encountered. This result does, however, raise a different question. Since unmarked comparatives of the Japanese/Armenian are quite common (roughly a third of the 110 languages in Stassen 1985 have this type of comparative): why is it that the Armenian pattern of a zero comparative and an overt morphological superlative is so rare? I leave this question unanswered, noting that it may detract from the plausibility of the null comparative solution for Armenian.

Without delving deeper into this developing area, I leave this thread with the observation that there are at least two reasons to think that Modern Armenian, despite initial appearances, is not a counter-example to the SSG. First, the putative affixal superlatives may well not be affixes. Second, the language may have a (null) affixal comparative, a device widely appealed to in the analysis of other languages with similar syntactic and semantic properties. If either, or both, of these considerations prove to be valid, then the SSG stands unthreatened as a linguistic universal.

### 3.5 Containment and semantic considerations

The account of the CSG presented in section 2.2 above relies on the premise that the representation of superlatives in all languages (or at least all languages with suppletion) satisfies the Containment Hypothesis. The preceding sections have focused on providing morphological evidence, independent of patterns of suppletion, that the Containment Hypothesis holds true quite generally, with specific attention to explaining away apparently problematic cases. At this point, I wish to touch briefly on the question of whether there is any semantic evidence bearing one way or another on this issue. This is not the place for an in-depth discussion of the semantics. My aim here is instead to show that a compositional semantics for a containment structure seems attainable (as argued, with important caveats, by Stateva 2002), and that while this is not without challenges, some of the apparent problems for such an approach identified by Stateva may be orthogonal to the question of containment.<sup>44</sup>

In pretheoretic terms, a relationship between comparatives and superlatives might seem almost to require no special pleading. Relative superlatives seem by their very nature to be comparative in meaning: *biggest* means ‘big-

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<sup>44</sup>I am indebted to Jon Gajewski for helpful discussions of the semantics discussed in this section.

ger than all other members of the comparison set’. While this has intuitive appeal, not all formal treatments of the superlative include an explicitly comparative semantics. Consider the following two (partial) versions of a lexical entry for the superlative morpheme, drawn from the recent literature (these have been simplified in ways that are orthogonal to the point to be made).

$$(131) \quad \llbracket -est \rrbracket (R)(x)=1 \text{ iff } \forall y[y \neq x \rightarrow \max\{d:R(d)(x)=1\} > \max\{d:R(d)(y)=1\}]$$

$$(132) \quad \llbracket -est \rrbracket (R)(x)=1 \text{ iff } \exists d[R(d)(x)=1 \ \& \ \forall y[y \neq x \rightarrow \neg R(d)(y)]]$$

In each of these entries, the superlative takes two arguments: a gradable property  $R$  of type  $\langle d, \langle e, t \rangle \rangle$  (the adjectival stem) and an individual  $x$ . The first formalism (from Hackl 2009, 79, cf. von Stechow 1999, Heim 2000) is transparently comparative: the resulting expression is true just in case the individual has the property to a degree that is greater than the degree to which any other individual has the property. *John is the tallest* is true if the degree to which John is tall is greater than the degree to which any other (relevant) individual is tall. There is a comparison between (maximal) degrees encoded by the ‘greater than’ symbol in the lexical entry. For reference, compare the meaning that (Hackl 2000, 50) assigns to the comparative morpheme, given in (133). This element takes two (maximal) degree operators and compares them directly. The components of (133) are contained in the superlative in (131).

$$(133) \quad \llbracket -er \rrbracket (d)(d')=1 \text{ iff } \max(d) > \max(d')$$

The formalism in (132) (mentioned in Hackl 2009, n.36 as a “more standard semantics for the superlative”, see also Gajewski 2010) achieves essentially the same meaning, but without an explicitly comparative element. Instead, the expression is true if there is a degree to which the individual has the property in question, and no other individual has the property to that degree. Thus: *John is the tallest* is true if there is a degree to which John is tall (say 2.5m), and no other (relevant) individual is tall to that degree. While this paraphrases comparison, it is fairly clear that (132) does not contain (133).<sup>45</sup>

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<sup>45</sup>Although note that there are theories of the comparative that formally assign it a meaning, like (132), consisting of a conjunction plus a negation, such as Lewis (1970), Seuren (1973); see von Stechow (1984), Klein (1991), Schwarzschild (2008) for discussion. The two approaches to the formal semantics of the comparative in a rough sense track two of the major types of comparison in the worlds’ languages (Stassen 1985, 2008), where no

So our first conclusion from the semantics is this: to the extent that a representation like (132) is logically possible, it does not follow from logical considerations alone that the superlative must contain an explicit comparative element of meaning. The comparative sense may be achieved in an indirect manner, and the semantics alone does not force the Containment Hypothesis upon us.

The next observation about the semantic is the following: to the extent that the superlative does have a comparative element in its meaning, it is far from obvious from the semantic representation that this element stands in the right grammatical configuration to trigger the elsewhere reasoning that automatically extends the comparative stem allomorph to the superlative, discussed extensively above. Recall that the key reasoning is that the representation of the superlative satisfies the structural description of the rule (of exponence) in (39d), repeated here, ensuring that the comparative stem allomorph, and not the default allomorph, extends to the superlative environment.

- (39) d. BAD → hor- / \_\_\_ ] CMPR  
 e. BAD → špatn-

If we substitute (133) for CMPR in (39d), will the allomorph *hor-* be used in the superlative? It should be possible to set the theory up in such a way that the answer will be affirmative, for example, by stipulating that any morpheme that attaches to adjectives and has the comparative symbol in its representation will contain the comparative in the relevant sense. However, such a move seems to be empirically inadequate. Consider in this light Heim’s proposal for other degree operators, which also involve a comparative component. Heim’s semantics for the excessive operator represented by English *too* (as in *too tall*, *too good*) is given in (134), and it too contains the particular comparative morphological resources are invoked, namely the ‘exceed’ (i) and ‘conjoined’ (ii) types.

- i. Uqa cecela. Uqa ija wol-te-na.  
 3SG long 3SG 1SG surpass-1SG-3SG-PRES  
 ‘He is taller than me.’ (Amele (Trans-New-Guinea), Roberts 1987, 91)
- ii. a’e puku, ne anī  
 he long you no  
 ‘He is taller than you.’ (Urubu-Kaapor (Tupi-Guaraní), Kakumasu 1986, 346)

greater than symbol evaluating a relation among maximal degrees. Heim’s paraphrase for *John is too tall* is explicitly comparative: ‘John is **taller than** it is acceptable for him to be tall’ (Heim 2000, emphasis added).

$$(134) \quad \llbracket -est \rrbracket^w = \lambda P_{\langle s, dt \rangle}. \max(P(w)) > \max\{d: \exists w' \in \text{Acc}(w): P(w')(d)=1\}$$

But as noted above, in languages where the excessive degree is affixal (illustrated by Czech in (49)) this degree fails to trigger comparative stem allomorphy.<sup>46</sup> In addition to the evidence from suppletion, both the evidence from morphological transparency (nesting) and the SSG support the conclusion that the superlative is distinct from other degrees such as the equative or the excessive — even when affixal, excessive degree morphology does not typically embed comparative morphology, and languages may have a morphological excessive or absolute superlative without having a morphological comparative.<sup>47</sup> The modern Romance languages are of this latter type, as are the many languages lacking comparative morphology but with affixal intensifiers meaning roughly ‘very’ or ‘too’ (just as Heim’s *too* has a comparative component, the meaning of *very* could be plausibly rendered as ‘more than the average or normal degree’). There is no valid analogue of the SSG for degree morphology other than the relative superlative.<sup>48</sup>

In sum, the superlative morphemes proposed in the formal semantics literature, with the notable exception of Stateva (2002), attach directly to the gradable adjective stem, one of many degree heads, instantiating (46), repeated here, a configuration I have argued must be excluded.

$$(46) \quad [ [ \text{ADJECTIVE} ] \text{DEGREE} ]$$

But these authors’ concerns were not morphological, and one may ask whether semantic considerations force an indivisible structure on the superlative morpheme, or whether representations such as (131) might be seen as a

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<sup>46</sup>Whether Czech *pře-* includes an ‘excessive’ meaning is perhaps debatable, but the same behavior characterizes the Slovenian cognate *pre-* which is explicitly excessive (Herrity 2000).

<sup>47</sup>As is often the case, there is a potential for terminological confusion here. Hackl (2009) uses the terms ‘relative’ and ‘absolute’ superlative to refer to two different readings of the superlative, termed the ‘comparative’ and ‘absolute’ readings elsewhere. Both of these readings correspond to the ‘relative’ superlative in traditional descriptive terminology. The ‘absolute’ superlative in descriptive terminology means possessing a property to an extremely high degree. xx move this to earlier section and refer back from here.

<sup>48</sup>Very few languages have an affixal equative degree, hence an analogue of the SSG for the equative may be surface-true but one cannot exclude the possibility that this is accidental.

shorthand for a more complex structure decomposed into comparative and superlative elements, consistent with the morphological evidence. Stateva (2002), noting the transparent nesting in Serbo-Croatian and Old Church Slavonic/Old Bulgarian, argues extensively for just such a decomposition, proposing a formal semantics for a superlative element that embeds the comparative. In her theory, the comparative portion of the superlative meaning is assigned to a comparative head, and the superlative morphology amounts to, in effect, the meaning component ‘than all others’. Despite the promise of a dovetailing of considerations from the semantics and the morphology, Stateva ultimately retreats somewhat from her own conclusion, postulating, at least for English, that the comparative morpheme that is embedded in superlatives (her *-ER*) is semantically, as well as phonologically, distinct from that heading the true comparative (*-er*). Specifically, she proposes that the true comparative is quantificational, while that embedded in superlatives is not. The postulation of two distinct comparatives in this way is worrying from the theoretical perspective adopted here, since if there is such a difference, and if the morphology can ‘see’ this distinction, then the result that excludes the ABA pattern would be lost. A rule of stem allomorphy could (in principle) make specific reference to the quantificational comparative; said rule would then not extend to the superlative, and the (unattested) ABA pattern would be readily derived.

We could stipulate the problem away, and assert that even if Stateva is correct about the distinctions, the morphology is blind to the semantic distinctions that differentiate the quantificational and non-quantificational versions of the comparative. On the other hand, it behooves us to ask at this point: how strong are Stateva’s arguments that the two comparative morphemes are distinct? I do not have the means to explore this here, but wish to point to a direction that an investigation might take. As noted, Stateva’s arguments for this important difference in the comparatives is built largely around English. She considers distributional differences between comparative and superlative forms, and reasons that the superlative should pattern with the comparative in the relevant constructions, if they contained the same quantificational element. One such contrast she presents in detail is in the extensively discussed comparative conditional (or comparative correlative) construction, shown in (135) (for recent discussion of (135a) see, e.g., Den Dikken 2005 and references therein).

- (135) a. The faster he drives, the earlier he’ll get there.

- b. \* The fastest he drives, the earliest he gets there.

Stateva follows Wold (1991), Beck (1997) and others in assuming that the derivation of (135a) crucially involves movement of the comparative degree operator, a process licensed by its quantificational nature. She contends that (135b) is thus incorrectly predicted to be acceptable if the superlative contains the same quantificational comparative degree marker. The conclusion she draws is that the phonologically null comparative *-ER*, which she takes to be contained in superlatives is crucially different from the phonologically overt comparative *-er*, in that only the latter is quantificational. Thus the explanation that she offers of the contrast in (135) is that the (true) comparative, but not (the comparative in) the superlative, can undergo movement (Stateva 2002, 135). This state of affairs, as noted, is potentially problematic for the Containment Hypothesis developed here, inasmuch as I rely on the comparative morpheme being the same in both contexts (up to its phonological nullity). There are, however, lacunae in Stateva's argument, that undermine her conclusion, and thus void her argument against having the same comparative morpheme in both contexts.

In the first place, Stateva limits her discussion to the role of the comparative degree operator in the licensing of the construction, and does not consider the role of the additional element that derives superlatives from comparatives. As Jon Gajewski points out (personal communication, 2010), this is a potentially crucial omission. Beck (1997) begins with the observation that in comparative conditionals, an overt standard (*than*-clause) is disallowed:

- (136) The faster he drives (\*than me), the earlier he'll get there (\*than me).

For Beck, the impossibility of (136) follows from a core aspect of her proposal, namely that a (silent) standard of comparison is present in the semantics of (the head of) the construction, and therefore “an (additional) overt [standard] of comparison would be uninterpretable” (Beck 1997, 230). Now, under Stateva's theory, the superlative is decomposed into a comparative element and an additional element that (in combination with a contextual variable) “suppl[ies] the standard value” ((Stateva 2002, 105). For all intents, the meaning contributed by the superlative element is “than all (relevant) others.” But if this is semantically contributing a standard of comparison,

then this alone will suffice to explain the impossibility of superlative conditionals like (135b). The superlative cannot participate in this construction for exactly the same reason that an overt *than*-phrase is impossible (136). The quantificational nature of the (null) comparative is neither here nor there, and the pair in (135) provides no impediment to the unified theory proposed here in which there is but a single comparative morpheme in both comparative and superlative constructions, with mere surface differences in phonology.

The ability to maintain a unified semantic representation for the comparative is also a positive result for understanding (135) in cross-linguistic perspective. As noted above, there are many languages in which the (regular) comparative morpheme is transparently contained in the superlative. For Stateva, where the relevant factor in distinguishing (135a) from (135b) is the difference between *-ER* and *-er*, she would appear to expect that the contrast would disappear in languages that have but a single comparative morpheme used in both contexts. Such languages should allow superlative conditionals, analogous to (135b).

A preliminary investigation does not appear to support this, however. There are three languages in Den Dikken's (2005) survey of comparative correlatives in which the superlative transparently contains the comparative, namely Hungarian, Russian and French (affixally in the first, and periphrastically in the other two). So far as I can determine, all three pattern with English, excluding the superlative from the relevant construction.<sup>49</sup>

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<sup>49</sup>Plausible meanings could be assigned to the superlative examples. Thus, (137) could mean something like: 'To the extent the father is the tallest (e.g., by 5 cm), the child is the shortest by the same extent.', or for (138): 'Whatever he repeated the most, he became the most convinced of.' But the constructions are uniformly out, eliciting reactions such as 'impossible' or 'word salad'. A second Hungarian comparative correlative construction given in Den Dikken (2005) shows the same comparative/superlative asymmetry (i), but the superlative in this latter construction may be excluded on independent grounds.

i. Hungarian (A. Szabolcsi, personal communication, 2010):

- a. Minél több-et olvasol, annál több-et {meg-értesz /  
 what.ADESS more-ACC you.read that.ADESS more-ACC vm-you.understand  
 értesz meg}  
 you.understand vm

'The more you read, the more you understand.' (Den Dikken (2005))

- b. \* Minél leg-több-et olvasol, annál leg-több-et  
 what.ADESS SPRL-more-ACC you.read that-ADESS SPRL-more-ACC

- (137) Hungarian (A. Szabolcsi, personal communication, 2010):
- a. Amennyivel magasabb az apa, annyival  
 A-how.much-INST taller the father that.much-INST  
 alacsonyabb a gyerek.  
 shorter the child.  
 ‘The taller the father, the shorter the child.’ (Den Dikken  
 2005, 525)
- b. \* Amennyivel (a) leg-magasabb az apa,  
 A-how.much-INST (the) SPRL-taller the father  
 annyival (a) leg-alacsonyabb a gyerek.  
 that.much-INST (the) SPRL-shorter the child.
- (138) Russian (Zh. Glushan, N. Radkevich, personal communication, 2010):
- a. i čem bolee povterjal, tem bolee  
 and what.INSTR more repeated, that.INSTR more  
 ubeždal-sja.  
 convinced-REFL  
 ‘And the more he repeated (it), the more he became con-  
 vinced.’ (Russian National Corpus)
- b. \* i čem nai-bolee povterjal, tem nai-bolee  
 and what.INSTR SPRL-more repeated, that.INSTR SPRL-more  
 ubeždal-sja.  
 convinced-REFL
- (139) French (P. Schlenker, personal communication, 2010):
- a. Plus je lis, plus je comprends.  
 more I read, more I understand  
 ‘The more I read, the more I understand.’
- b. \* Le plus je lis, le plus je comprends.  
 the more I read, the more I understand

To extend her theory to account for this range of data, Stateva (see pp.110ff) has to posit systematic homophony for languages that show the

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{meg-értesz / értesz meg}  
 vm-you.understand you.understand VM

transparent embedding relationship. Such languages have two comparative morphemes abstractly, corresponding to *-ER* and *-er*, but the morphemes happen to receive the same pronunciation. Such systematic cross-linguistic homophony suggests a generalization is being missed. The generalization, I suggest, is that the explanation for the absence of superlative conditionals does not lie in the (non)-quantificational nature of the comparative morpheme, but rather, as discussed with respect to (136), in the contribution of the superlative morpheme to the meaning of a superlative. By giving the superlative the meaning “than all others”, and allowing the superlative to combine with the (regular) comparative, the absence of the superlative conditionals falls out as a special case of the same consideration that excludes (136).

It awaits future work to see if the other differences that Stateva identifies between comparatives and superlatives remain constant across the morphological divide between transparent and non-transparent containment. Of possible relevance is Herdan and Sharvit (2006), who examine the potential of a superlative to license a negative polarity item (NPI) in various definite and indefinite contexts. From the facts they examine, they construct an argument against quantifier-movement of the superlative. As with the cases Stateva discusses, this would be an odd restriction if the superlative contains the comparative, if they admit of quantifier movement of the comparative. However, Herdan and Sharvit (2006) discuss, in addition to English, Romanian, which they contend behaves the same as English in the relevant respects, although in Romanian, the superlative transparently forms superlatives by embedding comparatives under a demonstrative(-like element). In the domain of NPI-licensing too, then, it seems that the differences between superlatives and comparatives should not be attributed to the absence of the comparative morpheme in the former.

In any event, it should be noted that (at least as I understand the literature), Stateva’s conclusion that the superlative is non-quantificational (in contrast to the comparative), is by no means a consensus view, and a healthy debate on this point continues (see Hackl 2009, Gajewski 2010 for recent discussion). Authors on both sides of the debate note that the evidence for or against *-EST*-movement, the core of the quantificational analysis (Heim 1985, Szabolcsi 1986), is delicate at best and some key examples are subject to variation and uncertainty among speakers. Moreover, to date, extremely little attention has been paid to the relevant semantic properties of superlatives in languages other than English, and what evidence there is is somewhat

ambivalent.

In sum, I conclude that although the idea of embedding the comparative in the superlative is currently a minority view in the formal semantics literature, and while there are some hurdles to implementing this technically, at the level of current understanding, the project is by no means a lost cause, and the existing arguments against this decomposition of the superlative are inconclusive.

### 3.6 Chapter summary

Despite a few lacunae, I take it that there is overwhelming evidence in favour of a nested structure (or at least a containing structure) whereby the superlative properly contains the comparative. Although it is not morphologically transparent in all languages, it is always there. A corollary of this conclusion is that UG lacks a “superlative” morpheme, in the standard understanding of that term, namely, a single morpheme that attaches to an adjectival stem A, yielding a form meaning ‘more A than all others’. To the extent there appear to be affixes of this sort, such as English *-est*, the surface form masks an underlying grammatical complexity. UG only permits of a structure in which a comparative morpheme is properly contained within the representation of superlative adjectives. Extending this to periphrastic constructions, and adopting a relatively uncontentious view of locality, yielded two further predicted generalizations, namely the Root Suppletion Generalization and the Synthetic Superlative Generalization, both of which appear to be robustly supported cross-linguistically.

# Chapter 4

## CSG: The Data

In the preceding chapters, I have presented some representative examples of patterns of comparative and superlative suppletion, and sketched a theory that will account for the CSG, arguing that the account lies in a property of grammar, rather than accidents of historical change. With the theoretical results in mind, we may now examine in detail the empirical basis for the claimed generalizations, and discuss apparent counter-examples. Largely for expository reasons, I will break this presentation into three parts, looking first at qualitative adjectives (where there is a single problematic case), then adverbs, and finally, quantifiers (where the other two apparent problems lurk in paradigms for *many – more – most*). I have treated quantity denoting modifiers (*many, much, few, etc*) separately, since it is far from clear that these elements are adjectives in all the languages considered. See section ?? for a discussion of the method employed in assembling the data.

### 4.1 Adjectives

The first range of data to examine is comparative suppletion in qualitative adjectives. Table 4.1 presents a listing of suppletive cognate triples that is comprehensive as regards the descriptive material investigated for this book. There are 68 triples listed here, grouped by (rough) gloss. For each triple, one example is given; the fourth column states the language the examples is from, then lists other languages in which cognate triples are found. As discussed in xx, and xx, two triples count as distinct if they have non-cognate roots in at least one grade, even if there is overlap in other grades. Thus a single

example here may correspond to numerous languages (as in the case of the Germanic cognates to *good – better – best*), while in other cases multiple examples may overlap in some grades, if related languages show variation in a single grade (as in the Slavic ‘bad’ examples).

Examples of suppletion from languages lacking a morphological superlative, and thus having only positive and comparative grades, are not included. For example, Italian *cattivo – peggiore* and Catalan *dolent – pitjor* (both pairs meaning: ‘bad – worse’) involve positive roots that are distinct from the Latin root for ‘bad’ in the table. Similarly, Abaza and Abkhaz have suppletion for the comparative of ‘good’. But since these languages lack a synthetic superlative, they do not bear on the status of the CSG and are thus not included in this table.

Table 4.1: Suppletive adjectival triples

ADJ	CMPR	SPRL	LANGUAGE; COGNATES
GOOD			
good	<b>bett</b> -er	<b>be</b> -st	English; oth. Germanic
bra	<b>bätt</b> -re	<b>bä</b> -st	Swedish; Norwegian
gôd	<b>sêl</b> -ra	<b>sêl</b> -ost	Gothic
guot	<b>beg</b> -ur	<b>beg</b> -ur-ste	Giazza Cimbrian
dobr-ý	<b>lep</b> -ší	nej- <b>lep</b> -ší	Czech; Polish
dobar	<b>bol</b> -ji	naj- <b>bol</b> -ji	Serbo-Croatian; Slovenian
dobr-y	<b>redl</b> -iši		Sorbian <sup>1</sup>
dobr-yj	<b>krashch</b> -yj	naj- <b>krashch</b> -yj	Ukrainian
harn-yj	<b>krashch</b> -yj	naj- <b>krashch</b> -yj	Ukrainian
xoroš-ij	<b>luč</b> -še	nai- <b>luč</b> -šij	Russian
bon-us	<b>mel</b> -ior	<b>opt</b> -imus	Latin <sup>2</sup>
da	<b>gwell</b>	<b>gor</b> -au	Welsh
maith	<b>ferr</b>	<b>dech</b>	Old Irish <sup>3</sup>
mat	<b>gwell</b> -(oc’h)	<b>gwell</b> -añ	Breton

<sup>1</sup>The source does not provide the corresponding superlative, but Sorbian superlatives are formed on the general Slavic pattern with *naj*- prefixed to the comparative.

<sup>2</sup>The suppletive comparatives of Latin are retained in the Modern Romance languages, sometimes with a non-cognate positive root (especially in the forms meaning ‘bad’), but none of the Modern Romance languages retains a synthetic superlative.

<sup>3</sup>Comparative suppletion for this and some of the other patterns below is retained in modern Irish, Scottish Gaelic and Manx, but these languages lack a distinct superlative.

agathós	<b>ameín-ōn</b>	<b>fēr-istos</b>	Anc. Greek <sup>4</sup>
agathós	<b>areí-ōn</b>	<b>ár-istos</b>	Anc. Greek
agathós	<b>belt-íōn</b>	<b>bélt-istos</b>	Anc. Greek
agathós	<b>kreíss-ōn</b>	<b>krát-istos</b>	Anc. Greek
agathós	<b>ló-ïon</b>	<b>lō-istos</b>	Anc. Greek
pra-śásya-s	<b>śré-yān</b>	<b>śré-ṣṭhas</b>	Sanskrit
pra-śásya-s	<b>jyā-yān</b>	<b>jyē-ṣṭhas</b>	Sanskrit
xub	<b>beh-tær</b>	<b>beh-tær-in</b>	Persian
on	<b>hobe</b>	<b>hobe-ren</b>	Basque
on	<b>hobe</b>	<b>on-en</b>	Basque
hyvä	<b>pare-mpi</b>	<b>parha-i-n</b>	Finnish; other Fennic
š'ig'	<b>per'a-mp</b>	<b>per'-mus</b>	Kildin Saami
k'argi-i	u- <b>mĵob-es-i</b>	sa-u- <b>mĵob-es-o</b>	Georgian <sup>5</sup>
k'argi-i	u- <b>k'et-es-i</b>	sa-u- <b>k'et-es-o</b>	Georgian
ezär	xo- <b>č-a</b> , xo- <b>č-ēl</b>	ma- <b>č-ēne</b>	Svan <sup>6</sup>
BAD			
bad	<b>worse</b>	<b>wors-t</b>	English
ubil	<b>wirsi-ro</b>	<b>wirsi-sto</b>	OH German; O English
vándr	<b>ver-re</b>	<b>ver-str</b>	O. Icelandic; other Scandinavian
íllr	<b>ver-re</b>	<b>ver-str</b>	O. Icelandic; other Scandinavian
slem	<b>vær-re</b>	<b>vær-st</b>	Danish
ringur	<b>ver-ri</b>	<b>ver-st-ur</b>	Faroese
dålig	<b>vär-re</b>	<b>vär-st</b>	Swedish; Norwegian
dålig	<b>säm-re</b>	<b>säm-st</b>	Swedish
šlext	<b>erg-er</b>	<b>erg-st</b>	Yiddish
zł-y	<b>gor-szy</b>	naj- <b>gor-szy</b>	Polish; other Slavic
špatn-ý	<b>hor-ší</b>	nej- <b>hor-ší</b>	Czech
pohan-yj	<b>hir-šyj</b>	naj- <b>hir-šyj</b>	Ukranian
drènn-y	<b>hor-šy</b>	naj- <b>hor-šy</b>	Belorussian

<sup>4</sup>It is not clear that this should be treated as an ABC pattern, as opposed to two defective patterns — a comparative form lacking a corresponding superlative, and a superlative lacking a corresponding comparative. See, for example Seiler (1950).

<sup>5</sup>The adjective *k'argi-i* formed a regular (non-suppletive) comparative in Old Georgian (Fähnrich 1991).

<sup>6</sup>Gudjedjani and Palmaitis (1986) list four suppletive comparatives in Svan; but note also that the comparative forms in *xo- -a* for these adjectives are used with a positive sense, and subject to further comparative formation in *xo- - el*. It may thus be synchronically inappropriate to include these forms here.

blah-i	<b>hor-šy</b>	naj- <b>hor-šy</b>	Belorussian
loš	<b>gor-i</b>	naj- <b>gor-i</b>	Serbo-Croatian
plox-oj	<b>xuž-e</b>	nai- <b>xud-š-ij</b>	Russian
malus	<b>pějor</b>	<b>pejorare</b>	Latin
olc	<b>messa</b>	<b>messa-m</b>	Old Irish
drwg	<b>gwaeth</b>	<b>gwaeth-af</b>	Welsh
fall	<b>gwash-(oc'h)</b>	<b>gwash-añ</b>	Breton
kakós	<b>cheír-ōn</b>	<b>cheír-istos</b>	Anc. Greek <sup>7</sup>
kak'os	<b>hěssōn</b>	<b>hék-istos</b>	Anc. Greek <sup>8</sup>
BIG			
mikil-s	mai-za	mai-sts	Gothic; Old Germanic, Icelandic
velk-ý	<b>vět-ší</b>	nej- <b>vět-ší</b>	Czech; other Slavic
velyk-yj	<b>bil'-šyj</b>	naj- <b>bil'-šyj</b>	Ukrainian
duž-y	<b>więk-szy</b>	naj- <b>więk-szy</b>	Polish
mawr	<b>mwy</b>	<b>mwy-af</b>	Welsh <sup>9</sup>
ḍzyəd	xo-š-a, xo-š-ēl	ma-š-ēne	Svan
SMALL			
leitils	<b>minn-iza</b>	<b>minn-ists</b>	Gothic; OH Ger, Scandinavian
lýtel	<b>læssa</b>	<b>læ-st</b>	O. English
små	<b>mind-re</b>	<b>mind-st</b>	Danish; Norwegian <sup>10</sup>
mali, malen	<b>manji</b>	naj- <b>manji</b>	Serbo-Croatian; oth. Slavic
parvus; paulum	<b>min-or</b>	<b>min-imus</b>	Latin
bach	<b>llai</b>	<b>llel-af</b>	Welsh; Old Irish
mikrós	<b>meīōn</b>	<b>meī-stos</b>	Anc. Greek
mikrós	<b>elássōn</b>	<b>elach-istos</b>	Anc. Greek
OLD			
gamall	<b>ell-re</b>	<b>ell-ztr</b>	Old Icelandic; Scandinavian
NEAR			
agos	<b>nes</b>	<b>nes-af</b>	Welsh; Old Irish
STRONG			
cryf	<b>trech</b>	<b>trech-af</b>	Welsh

As is readily discerned, the overwhelming majority of the triples in Ta-

<sup>7</sup>This suppletive comparative pattern is retained for 'bad' in Modern Greek, but the superlative is periphrastic.

<sup>8</sup>Additional doublets are given in some sources.

<sup>9</sup>This form is possibly irregular, rather than suppletive.

<sup>10</sup>*Små* is a suppletive plural for singular *lille*.

ble 4.1 constitute ABB patterns, along with a handful of examples of ABC triples. There are no AAB patterns, and only one problematic (ABA) case, a doublet in some varieties of Basque, to which we return below

Though it plays no role in the account, it may be noted that the adjectives that show suppletion are drawn from a very limited set, with roots meaning ‘good’ and ‘bad’ together comprising almost 50 of the 70 cognate triples. There are a few cases of suppletion in comparison for ‘big’ and ‘small’, and isolated examples of suppletion for ‘old’ (Scandinavian), ‘near’ and ‘strong’ (the latter two in Celtic). This limited distribution is presumably unsurprising, as (true) suppletion is broadly limited to high-frequency, semantically basic vocabulary (but see Corbett 2007 for qualifications).

In some cases, the relationship between a positive adjective and the comparative (resp. superlative) degrees can be one:many, many:one or many:many, often (but not always) with a regular paradigm alongside a suppletive one. Some examples are given in (140):

(140)		POS	CMPR	SPRL	
	a.	Swedish: <b>god</b>	<b>bätt</b> -re	<b>bä</b> -st	‘good’
		(also):	<b>god</b> -are	<b>god</b> -ast	
	b.	French: <b>mauvais</b>	<b>pire</b>	le <b>pire</b>	‘bad’
		(also):	plus <b>mauvais</b>	le plus <b>mauvais</b>	
	c.	Georgian: <b>k’argi</b> -i	u- <b>k’et</b> -es-i	sa-u- <b>k’et</b> -es-o	‘good’
		(also):	u- <b>mĵob</b> -es-i	sa-u- <b>mĵob</b> -es-o	

In some instances at least, the doublets reflect a nuance in meaning. Holmes and Hinchcliffe (2003, 98) report that the Swedish comparative and superlative on the stem *god* is used for ‘pleasant-tasting’, while the suppletive forms are otherwise the usual ones. (Dietiker 1983, 104) notes that the French doublet in (140b) distinguishes comparison of abstract (*pire*) from concrete (*plus mauvais*) situations. Colloquially at least, English shows a doublet for *bad*, with suppletive forms *worse* – *worst* for the regular sense (antonym of *good*), but regular forms *badder*, *baddest* in the sense of *bad* in which it is in fact a term of approbation: cool, hip. awe-inspiring (senses 12 and 13 in the *Oxford English Dictionary*), thus:

- (141) a. ... a chance to check out our **badder** alloy wheels ...  
 b. I’m the **baddest** sonofabitch that ever moved.

The Swedish ‘bad’ paradigm shows a many:many interaction, with two basic adjectives *dålig*, *ond* and an adverb *illa* corresponding to two supple-

tive comparatives *sämre*, *värre* and superlatives *sämst*, *värst*. Holmes and Hinchcliffe (2003, 98-99) describe the choice among suppletive forms as denoting, respectively, ‘more of a bad property’ and ‘less of a good property’. In addition, they note a regular colloquial pair *dålig-are* – *dålig-ast* for the sense of ‘in bad (worse, worst) health’.

A particularly striking case of multiple comparatives for a single adjective is provided by the Ancient Greek forms for ‘good’, where five or more distinct suppletive comparatives or superlatives corresponded to a single positive stem (see (142) from Seiler 1950, Chantraine 1967).

(142)		POS	CMPR	SPRL	
	Anc. Greek:	agathós	ameínōn		‘good’
	(also):		beltíōn	béltistos	
	(also):		kreíttōn	krátistos	
	(also):		lóion	lōistos	
	(also):			féristos	

This situation leaves a degree of uncertainty in quantifying the data (counting the number of suppletive triples), in particular as there are gaps — there is no attested superlative corresponding to *ameínōn* and no comparative from root *fér-*. Moreover, sources differ to some extent on how many of these are treated as comparatives of *agathós*. On the other hand, whatever the answer given to these questions, it is clear that there is no ABA pattern lurking here, and they may be safely put aside.

Another source of uncertainty connected to doublets arises from examples where patterns of grammaticality and acceptability might diverge. Thus, for English, the adjectives *small* and *little* (in the same sense, rather than the sense of ‘few’) appear grammatically regular, as in (143).

(143)		POS	CMPR	SPRL
	a. English:	<b>small</b>	<b>small-er</b>	<b>small-est</b>
	b. English:	<b>little</b>	<b>little-r</b>	<b>little-st</b>

However, some sources suggest that the forms *littler*, *littlest* are not used. The *CGEL* notes “[t]he adjective *little* has *littler* as its comparative form, but this and superlative *littlest* are rarely used, the corresponding forms of *small* generally being preferred.” (Huddleston and Pullum 2001, 1124, n.15). Even more extreme is the view in the (linguistically conservative) *OED*, which states: “[*little*] has no recognized mode of comparison. The

difficulty is commonly evaded by resort to a synonym (as *smaller*, *smallest*); some writers have ventured to employ the unrecognized forms *littler*, *littlest*, which are otherwise confined to dialect or imitations of childish or illiterate speech.” Whether to count an ABB pattern *little* – *smaller* – *smallest*, at least for some speakers, thus seems to be a tricky question, but luckily one on which nothing in particular hangs.

A final remark in this vein concerns the existence of apparent suppletive doublets in some primary sources. For example, Turkish has two adjectives meaning ‘bad’: *fena* and *kötü*, both of which enter regular (periphrastic) comparative constructions: (*daha*) *fena* ‘worse’ (lit. ‘more bad’). English-Turkish dictionaries also offer *beter*, a borrowing from Persian, with the meaning ‘worse’, suggesting suppletion. Yet it is far from clear that *beter* is the comparative of either of the adjectives meaning ‘bad’; *beter* itself can enter into comparison: *daha beter* ‘more worse/bad’, and in constructions of explicit comparison (X is bad, but Y is worse), it appears that an overt comparative form (not just *beter*) is needed. I suspect that Turkish *beter* is like English *optimal* — a borrowed form with a meaning that is very similar to a superlative, but which is not a grammatical superlative. Thus, although *optimal* may be glossed “best” in dictionaries, it is subject to further comparison (*more optimal* receives 566,000 Google hits, August 10, 2006) and does not participate in grammatical constructions that characterize superlatives: *best*, *biggest of all* versus *\*optimal of all*. Similarly in Italian, adjectives such as *superiore*  $\hat{O}$ superior, higher $\tilde{O}$ , *maggiore*  $\hat{O}$ bigger $\tilde{O}$ , are transparent descendants of Latin comparatives (suffix *-ior*) but are now simple adjectives, and fail to participate in comparative constructions (*\*maggiore di* ‘bigger than’, A. Calabrese, personal communication 2006). One also finds sporadically words glossed as ‘better’ (and sometimes ‘best’) in languages lacking standard-comparative constructions, such as Nandi *kýkáy* (Creider and Creider 1989, 63), Swahili *bora*, *heri* (Ashton 1947, 202); though like English *optimal* and Turkish *beter*, these enter into comparative constructions as plain adjectives, and do not appear to constitute grammatically suppletive comparatives as opposed to lexical forms with comparative-like (or relative) meaning.<sup>11</sup> There is clearly a murky boundary here, though, between such cases and true suppletion. Although I put these types of examples aside, it should be noted that none of them would have contributed an ABA pattern, and their exclusion is thus not a means of sweeping aside inconvenient

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<sup>11</sup>I thank C. and J. Creider for discussion of these examples.

problems.

As a rule of thumb, in counting the data where the relationship is not one:one (positive:comparative) I have listed distinct triples separately, even when they occur in doublets. Thus Georgian in (140c) contributes two ABB pairs, and Swedish only one — the pan-Germanic GOOD – BETT – BETT (since the non-suppletive AAA member of the doublet is not counted, of course). For the unique case of the Greek data in (142) I have counted three ABB triples, and combined (perhaps unwisely) the two defective triples into a single ABC count. Furthermore as discussed in section xx, I have also counted distinct patterns where there is a doublet in the positive that resolves to a single triple for comparative and superlative (as in (52)). This counting strategy gives six ABB triples for Scandinavian ‘bad’, with Swedish, as it happens, having all six.

#### 4.1.1 The Basque problem

As noted, there is one doublet among the adjectives in the dataset that appears problematic for the CSG. This is the Basque form for *good*, given in (144), see Trask (1997, 100), Trask (2003, 140) (the *-(r)en* suffix is the regular superlative suffix). De Rijk (2008, 721) attributes the regular *onen* form (and related adverbial forms) to southern usage, with the triple in (144a) characterizing northern usage or elevated style.

- (144) a. Basque: **on hobe hobe-(r)en**  
b. **on-en**

In any event, the Basque pattern presents an apparent ABA pattern, on its own in southern usage, or as part of a doublet, a lone adjectival counter-example to the CSG.<sup>12</sup> Although I can not definitively dismiss the example, and leave it noted as a potentially important problem, it is perhaps worth drawing attention here to a curious property of the Basque superlative that may provide a clue to the analysis. Trask (1997, 210), attributing the original proposal to Wilhelm von Humboldt, notes that the superlative “is widely

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<sup>12</sup>Although the standard grammars reject a regular comparative (*\*on-ago*), Itziar Laka (personal communication 2006) and a Basque audience member at a presentation of this material (Rutgers, 2006) note that the form is indeed occasionally met with. However, from what I can glean, this is unlikely to constitute the general situation, and the pattern in (144) likely represents the norm.

thought to represent a specialization of genitive *-en*”. According to the literature, the two are systematically homophonous (see for example, De Rijk 2008, 720). More to the point, the ‘genitive’ is somewhat of a mis-nomer, implying, as it does that the suffix is a case-marker. Rather, the genitive suffix *-(r)en* attaches to nominals (with internal syntactic structure, according to de Rijk), allowing them to serve in as adnominal modifier functions, including possession. Yet while the function is in this way similar to genitives in other languages, the morphological behaviour is derivational (De Rijk 2008, 45, citing also Mitxelena 1988); for example the genitive may be followed by appropriate case suffixes, and indeed, the genitive itself may iterate in appropriate contexts (with concomitant iteration of the definite article in both instances, as required). Examples of both follow:

- (145) a. gizon-a-ren-gatik  
 man-DEF-GEN-BECAUSE  
 ‘because of the man.’
- b. katu-a-ren-a-rekin  
 cat-DEF-GEN-DEF-WITH  
 ‘with the one of the cat’
- c. alkate-a-ren alaba-ren dirua eta  
 mayor-DEF-GEN daughter-GEN money and  
 apaiz-a-ren-a-ren-a  
 priest-DEF-GEN-DEF-GEN-DEF  
 ‘the money of the daughter of the mayor and (that) of the one of the priest’

On this approach, an apparent superlative expression as in (146) would have to derive its meaning from a structure more loosely paraphrased as something like ‘among the tales in the world, the good one’, or more cumbersome ‘... the one of the good (ones).’

- (146) mundu-ko ipuin-ik on-en-a  
 world-ADNOM story-PART good-GEN-DEF  
 ‘the best tale in the world’ (cited in De Rijk 2008, 721)

A plausible route from genitive to superlative can be envisaged on comparative grounds. Cross-linguistically, a common means of expressing a superlative meaning without superlative morphology, is to use the positive or

comparative form of the adjective, with the adjective root also occupying the position of the standard. Examples from four unrelated languages are given here (note that the literal paraphrases are not ‘the best of the best’ (as in English) but rather more like ‘better than good’):

- (147) a. eki-den eki  
 good-ABL good  
 ‘(the) best’ (Tyvan, Anderson and Harrison 1999, 33)
- b. riti khə tirut kapur  
 good.ABL more good cloth  
 ‘the best cloth’ (Kashmiri, Wali and Koul 1997, 137)
- c. teđi-leš no teđi  
 white-ABL NO white  
 ‘whitest’ (Udmurt, Winkler 2001, 42)

In some languages, including Basque, this type of expression serves an intensifying, rather than strictly superlativizing function:

- (148) a. uyúm-ćum uyúm  
 big-CMPR big  
 ‘very big’ (Burushaski, Berger 1999, 76)
- b. ilun baino ilun-ago ...  
 obscure even obscure-CMPR ...  
 ‘extremely obscure’ (Basque, De Rijk 2008, 718)

In some languages with superlative constructions of the sort in (148), the ‘standard’-marking adjective may take the genitive or possessive form. In Tyvan, for example, alongside (147a) with the ablative, the adjective is marked genitive when the head adjective is substantivized:

- (149) eki-niŋ eki-zi  
 good-GEN good-NML  
 ‘(the) best of all’ (Tyvan, Anderson and Harrison 1999, 33)

Examples such as (149) provide a clear potential source for a genitive or possessive marked adjective to become conventionalized as a superlative. Ellipsis of the head (deadjectival) noun in (149) would yield something that on the surface is identical to the problematic case from Basque. As there is no comparative morpheme inside the genitive marked adjective, there is no expectation of suppletion in such a form. It is thus conceivable, though far from established, that Basque in fact lacks a true (grammatical) superlative, using an elliptical construction with the genitive instead. Since both positive and comparative adjectives may be marked genitive, the attested doublet in (144) is perhaps therefore unsurprising. Having noted the possibility of an analysis capitalizing on the superlative-genitive homophony, I leave Basque for now as an unresolved challenge.

Another challenging case that should be mentioned is Old Irish. Thurneysen (1909, 226) gives the following suppletive paradigms (with some further variations in the forms for ‘smaller, smallest’, not relevant here):

(150)	POS	CMPR	SPRL	
a.	<b>maith, dag-</b>	<b>ferr</b>	<b>dech, deg</b>	‘good’
b.	<b>olc, droch-</b>	<b>mess-a</b>	*	‘bad’
c.	<b>bec(c)</b>	<b>lug-u</b>	<b>lug-am</b>	‘small’
d.	<b>acus, ocus</b>	<b>ness-a</b>	<b>ness-am</b>	‘near’

The last three of these are unproblematic, but (150a) shows an apparent alternation in the positive form between *maith*, which enters into an ABC pattern, and *dag-*, which, adhering to the manner of doublet-counting above, would seem to constitute an ABA pattern if it is the same root as *dech*. But there may in fact be no doublet here at all, and hence no problem. In Old Irish, according to Thurneysen’s description, adjectives entered into one of two morphosyntactic frames. In one frame, Thurneysen’s ‘inflected adjectives’, the adjective could be used predicatively or attributively (in the latter case following the head noun) and agreed in number, gender, and case with the noun they modified. The inflected forms of ‘good’ and ‘bad’ were *maith* and *olc*, respectively. In contrast to the inflected adjectives were ‘uninflected’ forms. These latter stood before the noun they modify, forming a compound-like morpho-phonological unit with it, as diagnosed by stress and consonant lenition. Not all inflected adjectives had a corresponding uninflected form, and among those that did, ‘good’ and ‘bad’ had the special property of using distinct roots for the uninflected construction (*dag-* and *droch-*, respectively). What is important for present purposes is that comparative and superlative

forms, although they did not take morphological inflection, had the syntactic distribution of ‘inflected’ forms, occurring primarily in predicate position (Thurneysen 1909, 223). In other words, there are really two syntactic environments to consider: the compound-internal environment, in which there is no gradation and hence no paradigm, and the compound-external environment, represented by predicative forms. While the majority of adjectives used the same root in all contexts, the root meaning ‘good’ occurs as *dag-* in the compound construction, whereas in the syntactic construction that allows for the expression of comparison, the only possibility was *maith – ferr – dech*. The appearance of a problematic triple in the doublet in (150) is thus an artefact of the presentation, in particular, of the conflation of two distinct morpho-syntactic constructions or environments.

In sum, of the 68 distinct adjectival cognate triples in 69 languages with comparative suppletion consulted for this project, only a single qualitative adjective paradigm stands out as potentially problematic, namely the doublet superlatives in the triple meaning ‘good – better – best’ in Basque, and there is at least some reason to wonder if this is a true counter-example.

## 4.2 Adverbs

In many languages, there are close morphological connections between adjectives and adverbs, and indeed, suppletive gradation is encountered among adverbs as well. Some examples are given in (151).

(151)		POS	CMPR	SPRL	
a. English	ADJ:	<b>bad</b>	<b>worse</b>	<b>wor-st</b>	
	ADV:	<b>bad-ly</b>	<b>worse</b>	<b>wor-st</b>	
b. Czech	ADJ:	<b>dobř-ý</b>	<b>lep-ší</b>	nej- <b>lep-ší</b>	‘good’
	ADV:	<b>dobř-e</b>	<b>lep-e</b>	nej- <b>lep-e</b>	‘well’
c. French	ADJ:	<b>bon</b>	<b>meilleur</b>	le <b>meilleur</b>	‘good’
	ADV:	<b>bien</b>	<b>mieux</b>	le <b>mieux</b>	‘well’
d. Karelian	ADJ:	<b>hyvä</b>	<b>pare-mpi</b>		‘good’
	ADV:	<b>hyv-in</b>	<b>pare-mm-in</b>		‘well’
e. Georgian	ADJ	<b>cud-i</b>	u- <b>ar-es-i</b>		‘bad’
	ADV	<b>cud-ad</b>	u- <b>ar-es-ad</b>		‘badly’

In all of these examples (and in the majority of examples of suppletive adverbial comparatives), the adjective and the adverb share a root and the

suppletive patterns are also shared, as in English *bad-ly* – *worse* – *worst*. Such examples thus add no distinct data points, if we count distinct cognate root triples.

There are however a small number of examples where the roots in the adverbial triple are not (fully) cognate with the adjectival roots. One such example is English *well* (and cognate Icelandic *vel*), suppletive adverbial form of *good*; some others are given in (152):<sup>13</sup>

(152)		POS	CMPR	SPRL
	a. English	<b>well</b>	<b>bett-er</b>	<b>be-st</b>
	b. German	<b>gern(e)</b>	<b>lieb-er</b>	am <b>lieb-st-en</b> ‘willingly, rather’
	c. Icelandic	<b>gjarna</b>	<b>held-ur</b>	<b>hel-zt</b> ‘willingly, rather’
	d. German	<b>bald</b>	<b>ehe-r</b>	am <b>ehe-st-en</b> ‘soon’

I will argue here that at least some of these, in particular English (152a), should not count as true ABB patterns in the sense relative to the CSG, though others, such as those in (152b-d) should. The discussion is somewhat of an aside, in the sense that the patterns under investigation are superficially consistent with the CSG, so nothing of consequence hinges on whether they are to be included in or excluded from the range of relevant data. Nevertheless, discussion of this case will illustrate a more general point about containment, and in particular about alternate derivational routes that converge on a similar endpoint. This consideration will play a role in other sections as well.

The question at issue here is whether the containment relation in (36a) (repeated in (153), with a-root intended to cover both adjectives and adverbs) holds of adverbs, as well as adjectives.

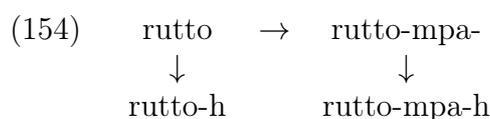
(153) [ [ A-ROOT ] COMPARATIVE ]

There is reason to be suspicious of this, however. In some languages, the overt morphology seems to indicate that the comparative adverb is derived not from the positive adverb, but rather from the comparative adjective. That is, although the comparative adverb like *better* appears to function as the comparative of *well*, its actual derivation is more circuitous, at least

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<sup>13</sup>Ancient Greek *eu* ‘well’, which is apparently the suppletive adverb corresponding to *agathos* ‘good’, may be another instance of the pattern shown by English ‘well’, being compared by the suppletive forms of the corresponding adjective, though I was unable to extract this information definitively from Liddell and Scott (1996).

in some languages. Karelian illustrates this pattern. The suffix *-h* forms adverbs from adjectives, as illustrated by the pair *rutto*, *rutto-h* ‘quick, quickly’. In the corresponding comparatives, the adverb-forming morphology is clearly peripheral to the comparative, thus *rutto-mpa-* ‘quicker’ (adjective, oblique stem), *rutto-mpa-h* ‘quicker’ (adverb). Assuming affix order reflects derivational history, this implies that the adverbial comparative is derived from the adjectival comparative, rather than being the comparative of the adverb as such. This is indicated schematically in (154):



Georgian, with a circumfixal comparative, appears to show the same pattern as Karelian, though the evidence is perhaps more slender. The adverbial case suffix *-ad* derives adverbs from adjectives (and nouns), as in *xšir-i* ‘frequent-NOM’, *xšir-ad* ‘frequently’ (Hewitt (1995), also <http://www.translate.ge>). As in Karelian, the adverbial case suffix stands outside the comparative (at least for those adjectives that take a morphological comparative alongside the periphrastic construction).<sup>14</sup> In these languages, where an adjective takes a suppletive comparative, that suppletion is ‘inherited’ by the adverb (cf. (151)):<sup>15</sup>

(155)

	POS	CMPR		
a. Karelian	ADJ:	<b>hyvä</b>	<b>pare-mpi</b>	‘good’
	ADV:	<b>hyv-in</b>	<b>pare-mm-in</b>	‘well’
b. Georgian	ADJ	<b>k’argi-i</b>	u- <b>mjob-es-i</b>	‘good’
	ADV	<b>k’argi-ad</b>	u- <b>mjob-es-ad</b>	‘well’
c. Georgian	ADJ	<b>cud-i</b>	u- <b>ar-es-i</b>	‘bad’
	ADV	<b>cud-ad</b>	u- <b>ar-es-ad</b>	‘badly’

The proposed derivational ‘path’ to the comparative adverb, supported by the regular morphology, explains why this is so. The forms that serve the

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<sup>14</sup>Hewitt (1995, 49) provides more than a dozen examples of regular morphological comparatives, but at least some speakers report that, with the exception of the suppletive forms (as in (155)) the comparative reading is unavailable, and the forms reported by Hewitt have only an intensified or absolute superlative sense (L. Nash, personal communication 2010, see also Aronson 1989, 246)

<sup>15</sup>Rjagoev (1977, 163) gives *hüve-mm-in* as an alternative alongside *pare-mm-in* for the Tixvin dialect of Karelian.

function of the comparative of the adverb are derived from the comparative of the adjective, and thus contain that form's idiosyncratic properties.

Yet if this same derivational path is employed by English (and Icelandic), then the triple *well* – *better* – *best* is not a genuine triple after all. Although it appears to be an ABB pattern (consistent with the CSG), in fact there may be no direct relationship between *well* and *better*. In other words, assume that the structure of English adverbial comparatives is as in Karelian and Georgian, namely:

(156) [ [ [ GOOD ] CMPR ] ADV ]

The vocabulary fragment with the exponents of English GOOD may be as in (157).

(157) a. GOOD → well /     ] ADV ]  
 b. GOOD → be(tt)- /     ] CMPR ]  
 c. GOOD → good-

This reasoning would in fact explain why the (apparent) comparative of *well* must be *better*, rather than *\*weller*, on the further assumption that rule (157b) and not (157a) must apply in this context. This last assumption goes somewhat beyond classic elsewhere ordering (neither (157b) nor (157a) is obviously more specific than the other) but seems to be reasonable, either because the comparative is closer to the root in (156) than the adverbial marker, and thus (157b) takes priority over (157a), or because the structural description of (157a) is not met in (156) (the comparative intervenes). In Chapter 3, I explore the possibility that the contexts for root allomorphy can only make reference to contiguous morphemes (cf. Embick 2010), which would force the conclusion just stated. There are, however, various empirical problems with the claim that allomorphy is restricted to (surface) adjacency (one of which is mentioned in the next paragraphs).<sup>16</sup>

It should be noted that the derivation in (154) does not appear to be universal. In Standard Basque, comparative *-ago* attaches outside adverb-forming *-ki*, with adverbial comparatives apparently derived from adverbs, rather than from adjectival comparatives, a different derivational history from that in Karelian and Georgian.

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<sup>16</sup>Elsewhere does not impose a total ordering; Irish *deg-*, Celtic equative, without running a foul of ABA by accidental homophony. XX move this to subsequent chapter.



‘bad’ -JDB] is little used... It’s place is taken by *gaizki*, derived from the adjective *gaitz*, which, however, has changed its former meaning ‘bad’ to ‘difficult’ (and also ‘tremendous’), so that we are faced with a typical case of suppletion: *txar* ‘bad’, *gaizki* ‘badly’.” Because the morpheme order in Basque is the reverse of what is seen in Karelian and Georgian, the logic that excluded *\*well-er* in (157) (given (159a)), will make the opposite prediction for Basque: the suppletive root in the adverbial context should be preserved in the adverbial comparative. Strikingly, this is correct: adverbial *gaizki* – *gaizkiago* ‘badly – worse’, alongside adjectival *txar* – *txarrago* ‘bad – worse’ (De Rijk 2008, 709); *-ago* being the regular comparative suffix.

Before drawing too strong a conclusion from this one example, though, I note that here, as in the previous section, the Basque root for ‘good’ shows a puzzling behaviour. In Basque, the adverbs from ‘good’ are regular, and not suppletive: *on* ‘good’, *on-do*, *on-gi* ‘well’ (the suffixes are underlying *-to*, *ki*; the voicing in *ongi* is irregular, and the suffix *-to* is unproductive). The comparative of the adjective is suppletive *hobe* ‘better’. For this adjective, it is the comparative allomorph and not the regular root that appears in the adverbial comparatives: *hobe-to*, *hobe-ki* ‘better (adv.)’. There is, however, a further difference between the forms for ‘better’ and the other adverbial comparatives, including *gaiz-ki-ago*, namely that in addition to the root alternation, the comparative suffix *-ago* is missing from the various ‘better’ forms. In Chapter 5, I will suggest a reason why this might be significant (and potentially problematic).

Taking stock, the important point that we have seen in this aside is that there may be more than one derivational path available to a given surface result. In the case at hand, a form that would appear to be the comparative of a (deadjectival) adverb, may be derived either as the comparative of the adverb (as in Basque), or as the adverbialized comparative (as in Karelian). This subtle difference (for which there may be no clues in the overt morphology, as in English) nevertheless has important consequences for the interaction of suppletion and comparative formation. This general logic, developed here for cases such as English *well* which are innocuous for the purposes of the CSG, will turn out to have more important applications later in this work.

Now, while *well* – *better* – *best* may end up being irrelevant for the CSG, there are a handful of additional suppletive paradigms which are not extensions of corresponding adjectives, and these may indeed contribute relevant triples. Two such patterns are from German, as characterized in standard reference works (e.g., *WDS*), namely *gern(e)* – *lieber* – *am liebsten* ‘gladly –

rather’ and *bald – eher – (am) ehesten* ‘soon – sooner – soonest’.<sup>19</sup> The former (with correspondents in other Germanic languages, thus West Frisian: *graach/jeerne – leaver – leafst*) is a recent innovation according to Seiler (1950, p.32, n.2), who gives *gern – gerner – am gernsten* as being attested into the 18th century. Examples illustrating its use are given in (160) – the (b) example shows an *als* ‘than’ phrase, the hallmark syntax of a comparative:

- (160) a. Tee trinke ich gerne, aber Kaffee trinke ich lieber.  
 tea drink I gladly, but coffee drink I rather  
 ‘I’m happy to drink tea, but I would rather drink coffee’
- b. Tee trinke ich lieber als Kaffee.  
 tea drink I rather than coffee  
 ‘I’d rather drink tea than coffee.’
- c. Leo geht gerne in die Schule, aber ins Sommercamp ist er  
 Leo goes gladly in the school, but in.the summer.camp is he  
 noch lieber gegangen.  
 even rather go.PARTIC  
 ‘Leo happily goes to school, but he went to summer camp even  
 more happily.’

As with the English *little* paradigm discussed above, it is not clear whether we are dealing here with a suppletive pattern as opposed to a defective one, in which *gern(e)* has no comparative, but for which (inherently) comparative *lieber* ‘rather’ (lacking a positive) is a close synonym. English *rather* is transparently historically a comparative (of the now obsolete *rathe*), as evidenced by its ability to license a *than*-complement (as in the translation to (160b)), but it is hard to see *rather* as synchronically the suppletive comparative of an adverb like *gladly*. In any event, a decision on whether these cases are suppletive triples or confluations of defective paradigms does not affect the theoretical questions in this book (it affects only the quantitative aspects

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<sup>19</sup>Ultan (1972, 144) offers this adverb as an ABA pattern: *bald – eher – (am) baldigsten*. Yet on both semantic and distributional grounds, this appears to be in error. The form *(am) baldigsten* does not appear to be the (relative) superlative of *bald*; that is, it does not mean “sooner than all others”, rather, it is restricted in meaning to something like “as soon as possible” (compare also the positive adjective *baldig* ‘early’). The superlative corresponding to comparative *eher* is the regular *(am) ehesten*, see, e.g., WDG, which notes also dialectal regular gradation: *bald – bälde/balder – (am) bäldesten/baldesten*.

in the number of relevant cases) and I will not pursue the analysis of these examples further.

Before closing this section, let us return briefly to one other point raised earlier, but which can perhaps be appreciated more clearly in light of the discussion of (157). Above, I rejected the assumption, common in some semantic approaches (see, e.g.. Kennedy 2007b) that the positive degree of the adjective contains a null morpheme -POS that is not contained in the comparative, as in (161):

- (161) a. positive            [ [ A-ROOT ] POS ]  
       b. comparative    [ [ A-ROOT ] COMPARATIVE ]

If this were indeed the correct representation, nothing would go wrong for any of the examples discussed so far, since there is no reason to assume anything but the default exponent in the positive slot of the adjectives. However, a theory incorporating (161) might have the added power needed to generate ABA patterns. Consider, specifically, the hypothetical paradigm in (162). This incorrectly admit *\*good – better – good-est*.

- (162) a. GOOD → good - / \_\_\_ ] CMPR ] SPRL  
       b. GOOD → good- / \_\_\_ ] POS ]  
       c. GOOD → bett- / ( \_\_\_ ] CMPR ] )

Discussing the basic case of \*ABA above, I suggested (see n. 8) that learners do not posit contextual allomorphs that are accidentally homophonous with the default exponent of a given morpheme. That assumption (discussed further in chapter 3) prevented deriving *\*good – better – goodest* as an ABC pattern, with A,C accidentally homophonous. But (162) subverts that result, since (162b) is not a default, but is instead a contextual allomorph restricted to the \_\_\_ POS environment. Although there are two homophonous allomorphs in (162), they do not stand in a subset-superset relation to one another, and the consideration of note 8 thus does not obviously apply. I continue, therefore, to reject the postulation of a -POS suffix for adjectives.

In sum, the few suppletive patterns in adverbs appear to add nothing new to our understanding of the CSG.<sup>20</sup> The few patterns that are not extensions

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<sup>20</sup>The Basque adverbial patterns for ‘good’ track the adjectival patterns, thus yielding a doublet, or dialectally, an ABA pattern in the south, but if this is an extension of the adjectival pattern, then it is merely a special case of the problem already encountered above.

of adjectival patters are consistent with the CSG (despite Ultan’s claim to the contrary, see note 19), but this appears to be a fact that is derivative of the patterns of the underlying adjectives. It appears that, in many languages at least, adverbs, by virtue of their structure, fall outside the scope of the CSG.

### 4.3 Quantifiers

The next (and last) empirical domain we turn to, regarding the empirical basis of the CSG, is quantificational elements, namely, words meaning ‘many, much’ and ‘few, little’. These enter into comparative (and superlative) constructions, and participate in suppletive patterns, as shown in English:

(163)	POS	CMPR	SPRL
	a. many	more	most
	b. much/a lot (of)	more	most
	c. (a) few	fewer/less	fewest/least
	d. (a) little	less	least

Suppletion patterns for ‘many,much’ are in fact among the most common source of suppletive paradigms, and there are a few cases of suppletion for ‘few’. A list of 37 cognate triples for quantifiers is given in Table 4.2. Note that for a number languages, such as Kabardian, only the words for ‘much, many’ are reported to be suppletive. Note that many languages use related forms for ‘many’ and ‘big’, or for ‘small’ and ‘few’. Where the roots in the quantifier triples are fully cognate with those in the adjective table, the triples are listed only in the first table; however, in keeping with the general counting scheme used throughout, entires are given in the quantifier table when the comparative (and superlative) are cognate with ‘bigger’ or ‘smaller’, but the positive root of the quantifier is not cognate with an adjective.

Table 4.2: Suppletive quantifier triples

MANY, MUCH			
many	<b>mo-re</b>	<b>mo-st</b>	English; Scandinavian
much	<b>mo-re</b>	<b>mo-st</b>	English; Scandinavian <sup>21</sup>

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<sup>21</sup>The cognate triples for the *many* and *much* roots do not pattern the same across Germanic; for example, in Danish, Norwegian and Swedish, the cognate to English *much*

(a) lot	<b>mo-re</b>	<b>mo-st</b>	English <sup>22</sup>
viel	<b>me-hr</b>	<b>mei-st</b>	German; other Germanic
nógv-ur	<b>mei-ri</b>	<b>me-st-ur</b>	Faroese
party	<b>me-er</b>	<b>mee-ste</b>	Afrikaans
baie	<b>me-er</b>	<b>mee-ste</b>	Afrikaans
sakh	<b>me-r</b>	<b>me-r-ste</b>	Yiddish
mange	<b>fle-re</b>	<b>fle-st</b>	Danish; Scandinavian
mnoho	<b>víc-e</b>	nej- <b>víc-e</b>	Czech; Serbo-Croatian
mnogo	<b>bol'š-e</b>	naj- <b>bo'lš-ij</b>	Russian
mnogo	po- <b>več-e</b>	naj- <b>mnogo</b>	
wiele	<b>więc-ej</b>	naj- <b>więc-ej</b>	Polish
puno	<b>već-e</b>	naj- <b>već-e</b>	Serbo-Croatian
baháto	<b>bil'-šyj</b>	naj- <b>bil'-šyj</b>	Ukrainian
dúže	<b>bil'-šyj</b>	naj- <b>bil'-šyj</b>	Ukrainian
daudz	<b>vair-âk</b>	vis- <b>vair-âk</b>	Latvian
mult-	<b>plū-s</b>	plūr-imu-s	Latin
kalz	<b>mui-(oc'h)</b>	<b>mui-añ</b>	Breton
llawer	<b>mwy</b>	<b>mwy-af</b>	Welsh
polús	<b>ple-íōn</b>	<b>ple-ístos</b>	Anc. Greek
šat-erë	aveli	amena-šat	Armenian
asko	<b>gehiago</b>	<b>gehien</b> <sup>23</sup>	Basque
monet	<b>usea-mmat</b>	<b>use-i-mmat</b>	Finnish
paljon	<b>ene-mmän</b>	<b>en-iten</b>	Finnish
äijä	<b>enä-mpi</b>	<b>äij-in</b>	Karelian
sok	tö-bb	leg- <b>tö-bb</b>	Hungarian
bevri	<b>met'-i</b> <sup>24</sup>	u- <b>met'-es-i</b>	Georgian
kwad, ba	<b>nax</b>	<b>nax-deda</b>	Kabardian
FEW			
(a) little	<b>less</b>	<b>leas-t</b>	English

compares, like English, with a cognate to *more*, but the cognates of *many* compare via the root *fle-* (see below).

<sup>22</sup>A *lot of* or *lots of* has replaced *much* as the positive form of the mass quantifier in many contexts, but is of course still compared exclusively with *more*. Including this item does raise a question of boundaries — I have not included, for example, other roughly similar measure expressions, such as the count expression *a bunch (of)*.

<sup>23</sup>Recall from section 4.1 that it is unclear if the Basque suffix *-en* is a true superlative; if it is not, then the Basque triple is not relevant.

<sup>24</sup>The word for 'more' lacks comparative morphology, while the word for 'most' has comparative, rather than the expected superlative morphology.

weinig	<b>minder</b>	<b>mind</b> -ste	Afrikaans; Dutch
(en) bytsje	<b>minder</b>	<b>minst</b>	Frisian
troxi	<b>men</b> -še	naj- <b>men</b> -šij	Ukrainian, Slovenian
paucus	<b>min</b> -or	<b>min</b> -imus	Latin
olígos	<b>hész</b> -ōn	<b>hék</b> -istos	Anc. Greek
olígos	<b>meí</b> -ōn	<b>meĩ</b> -stos	Anc. Greek

Suppletive paradigms for quantifiers are also attested in many languages that lack morphological superlatives; some examples meaning ‘many’ or ‘much’ are given in (164).

(164)	POS	CMPR
a. Manx:	<b>ram</b>	<b>smoo</b>
b. French:	<b>beaucoup</b>	<b>plus</b>
c. Spanish:	<b>mult</b> -o	<b>más</b>
d. Mod. Greek:	<b>polí</b> -s	<b>perissó</b> -tero-s
e. Ossetian:	<b>biræ</b>	<b>fil</b> -dær
f. Veps:	<b>ei</b>	<b>ena</b> -mba
g. Abkhaz:	<b>šarda</b>	<b>ajha</b>
h. Tatar:	<b>küp</b>	<b>artıq</b>

Note the inclusion of Abkhaz (N. W. Caucasian) and Tatar (Turkic) in this list, which, along with Kabardian (also N. W. Caucasian) in (??), are examples of suppletion outside (although not all that far outside) the Greater European Sprachbund families discussed in section 2.3.2. It is not always clear from grammatical descriptions, though, whether elements glossed as ‘more’ are really the comparative of ‘many/much’, and thus it is not clear that all such examples involve a suppletive relationship. For Tatar, for example, the *artıq* form is given with the meaning ‘more’ in some sources (including <http://www.suzlek.ru/suzlek/>), but other sources give a regular *küb-ræk*, Burganova et al. 1969, 173. Similarly in (unrelated) Lezgian, Haspelmath (1993, 433) gives an example with *artux* with the meaning ‘more’ (greater in quantity), noting that “[t]his could be considered a suppletive comparative form of *gzaf* ‘much’, but it is a unique case.’ Other examples given in the same chapter illustrate regular comparison with *gzaf*.

### 4.3.1 Many – more counterexamples

As with the adjectives considered above, where there are superlatives, the overwhelming majority of the 37 or so suppletive patterns are ABB patterns, but there are three apparent triples that look like ABA patterns, namely, the words for ‘many’ in Karelian, Armenian, and Bulgarian (Macedonian shares a cognate triple with Bulgarian in relevant respects):

(165)		POS	CMPR	SPRL
	a. Karelian:	<b>äijä</b>	<b>enä-mpi</b>	<b>äij-in</b>
	b. Armenian:	<b>šat</b>	<b>aveli</b>	<b>amena-šat</b>
	c. Bulgarian:	<b>mnogo</b>	<b>po-veče</b>	<b>naj-mnogo</b>

The Bulgarian-Macedonian examples have been discussed at some length in section xx. The available descriptions suggest that it is not correct to list them among morphological comparative forms in the first place, and that (despite orthographic conventions) they are periphrastic expressions.

Something similar appears to be true of Armenian. Although some grammars gloss *amena-* as a prefix meaning ‘most’, it appears instead to be a compounding form, consisting of the universal quantifier *amen* ‘all’ and the linking vowel *-a-* used to form compounds when the second member is consonant-initial (Dum-Tragut 2009, 671). The compound form alternates (freely, so far as I can tell with limited investigation) with a non-compounded form, where the universal quantifier serves as the standard of comparison (as in (166)) in a configuration that constitutes a regular (zero-marked) comparative in the language. As noted above, this is the most common means of expressing superlatives cross-linguistically (see section 85). For ‘most’, the corresponding form is: *amenen šat* ‘all-ABL-DEF many.

(166)	a.	Artak-ə	amen-a-partsrahasag e	
		Artak-DEF	all-LV-tall	BE.3SG
				‘Artak is the tallest.’
	b.	Artak-ə	amen-e-n partsrahasag e	
		Artak-DEF	all-ABL-DEF tall	BE.3SG
				‘Artak is the tallest.’ (lit: ‘Artak is taller than all.’)

What is at issue here is whether the modifier-head relation in a compounding structure should count as sufficiently local for  $X^0$ -internal triggering of contextual allomorphy. Evidently, it does not, at least for synthetic

compounds such as (166a) in which the modifier in the compound is the argument of the adjective, in this case the standard of comparison. At the relevant level of representation, (166a) has the same structure as (166b), and it is inaccurate in the present context to consider *amena* to be a superlative prefix.

This leaves only the Karelian example in (165a). There is no reason to suspect a hidden periphrastic structure here, but further digging casts some doubt on this pattern, and it may reflect the conflation of various dialect patterns. The ABA pattern in (165a) is given in Zajkov (1999, 51) and reaffirmed by P. M. Zajkov, who states that it is the only pattern (personal communication, 2008). Against this, the online Karelian-Russian-Finnish dictionary at <http://sanakniigu.onego.ru/> [as of October 2010] has no listing for the problematic *äijin*, giving instead *enin* for the superlative, thus an ABB paradigm (a shared root with the comparative, and the superlative suffix *-in*), as in (167).

(167)		POS	CMPR	SPRL
	a. Karelian:	<b>äijy</b>	<b>enä-mbi</b>	<b>en-in</b>

The pattern in (167), and not that in (165a) jibes with the results of a brief questionnaire with seven Karelian-speaking respondents in 2009 (all native speakers, and all but one daily users of the language, some working in Karelian media).<sup>25</sup> The questionnaire was designed to elicit comparative and superlative constructions, with regular adjectives as well as with the quantifier ‘many’. A part of the questionnaire asked for the Karelian equivalents of the (Russian translations of the) sentences in (168).

- (168) a. Pekka has many dogs.  
 b. Pavel has more dogs than Pekka.  
 c. Lauri has the most dogs.

The translations offered for (168a) and (168b) conformed to the suppletive comparative paradigm expected. Representative examples are given in (169)

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<sup>25</sup>I wish to thank Zhanna Glushan for conducting the survey in Karelia, and G. M. Alekseev, N. Antropova, N. Bukina, E. Filipova, M. V. Matveena, and two other speakers, for sharing their intuitions. The majority of questionnaire respondents characterized themselves as speakers of the Livvi dialect; Zajkov (1999, 9) notes that this dialect has final *y* where ‘Karelian proper’ has final *ä*; suggesting that the dictionary as well is based on a Livvi variety. Likewise, Zajkov (1999, 10) notes that Livvi *mb* corresponds to *mp* in the variety he describes.

(glosses are constructed on the basis of information in Zajkov (1999); there was some variation not relevant to the point made here.)

- (169) a. Peka-l            on äijy    koiru-a.  
           Pekka-ADESS is many dog-PART  
           ‘Pekka has many dogs.’  
       b. Puavila-l        on enä-mbi    koiru-a    migu Peka-l  
           Pekka-ADESS is more-CMPR dog-PART than Peka-ADESS  
           ‘Pavel has more dogs than Pekka.’

But for the superlative, none of the respondents gave the problematic form in (165a), or recognized it when asked.<sup>26</sup> Four of the seven speakers gave *enin* as the superlative of ‘many’, as in (170a). Other possibilities offered were *kaiki-s enä-mpi* ‘more than all’ (170b); expressing the superlative meaning via a comparative plus a universal quantifier is a strategy available in all Fennic languages, except perhaps some varieties of Finnish, according to Nau 1992), and is indeed the most common superlative forming strategy cross-linguistically (see section 3.2.3). One respondent also gave a periphrastic superlative, with intensifier *ylen* ‘very’ combining with the positive root. (This result is of potential interest as it was from the one speaker identifying themselves as a speaker of Ludian Karelian, whereas the superlative expression with *ylen* is attested only for non-Ludian varieties in Nau (1992).)<sup>27</sup>

- (170) a. Lauri-l            on en-in        koiru-a.  
           Lauri-ADESS is most-SPRL dog-PART  
           ‘Lauri has the most dogs.’

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<sup>26</sup>The one speaker of the Ludian variety offered *äijäon* to render comparative *bol’she* ‘more’ in isolation, but gave *äjnä-mbi* (plausibly a mis-transcription of *enämbi*) in the context in (169).

<sup>27</sup>‘Most’ was also translated as *kaikis suurin*, ‘biggest of all’ in one other context by one respondent. This may have been influenced by the Russian expression for ‘most’ in this context: *samoje bol’shoe količestvo* ‘most big quantity’. Another isolated option offered for (168c) was (i), which seems, like its translation, to be a reasonable paraphrase in the context given, but not a grammatical superlative construction.

- i. Lauri-l            on vie enä-mbi.  
           Lauri-ADESS is still more-CMPR  
           ‘Lauri has still/even more.’

- b. Lauri-l on kaiki-s enä-mbi koiru-a.  
 Lauri-ADESS is all-ELAT more-CMPR dog-PART  
 ‘Lauri has the most dogs. (lit: ‘more than all’)
- c. Lauri-l on ylen äijä koiru-a.  
 Lauri-ADESS is EMPH many dog-PART  
 ‘Lauri has the most dogs.

On the strength of this evidence, I will put aside the forms cited by Zajkov (1999) as perhaps resulting from an admixture of various dialects, or some other source. Zajkov (1999, p.7) identifies 33 dialects of Karelian, in 3 major dialect groups (*narečija*), including Ludian, and Nau (1992) notes specifically that there is substantial variation in superlative formation (as seen in (170)) in Karelian.

Taking the adjectives, adverbs and quantifiers together, we find more than 100 cognate triples, some representing a single case in one language variety, others reflecting broad and historically stable patterns (such as Germanic GOOD – BETT – BETT. There remain but a handful of apparently problematic ABA patterns, and these may thus seem quantitatively negligible. But the account offered above excludes the ABA pattern categorically, attributing its absence to aspects of UG. And UG brooks no dissent. The account will ultimately fail if it cannot be shown that these apparent affixal ABA patterns are just that — apparent — and may fall to an alternative explanation. While I have not conclusively demonstrated that the counter-examples are explained away, I hope to have shown here directions for potential explanations that have some measure of plausibility.

### 4.3.2 What’s *more*?

A final remark seems worth making concerning the status of the quantifiers, before bringing this part of the discussion to a conclusion. Patterns like *many – more – most* versus *many – more – \*maniest* are relevant to the account of the CSG only to the extent that the comparatives do in fact contain the quantifier roots. If the element meaning ‘more’ in some language is an underived (i.e., monomorphemic) item, with a comparative meaning, not derived from — and thus not containing — a quantifier like ‘many’ or ‘much’ in its representation, then the CSG would be irrelevant for this language. There would be no morphological relationship between ‘many’ and ‘more’. If UG allowed this, then the paradigms in (164) could be false paradigms, connected

by meaning only. One could analyze French, for example, as having an incomparable adverb *beaucoup* ‘many/much’ and an inherently comparative adverb *plus* ‘MORE’, with no derivational relationship (not even a suppletive one) holding between the two.

We may note off the bat that although an apparently suppletive ‘more’ is quite common, not all languages are of this sort. In many languages, the word that translates English *more* in the sense of ‘greater amount’ is transparently the comparative of ‘many’ or ‘much’. Some examples are given here:

(171)		POS	CMPR	SPRL
	a. O. Ch. Slavonic:	<b>mŭnog-ŭ</b>	<b>mŭnož-ai</b>	
	b. Lithuanian	<b>daug</b>	<b>daug-iau</b>	<b>daug-iau -siau</b>
	c. Sanskrit	<b>bahu</b>	<b>bahu-tara</b>	<b>bahu-tama</b>
	d. Chuvash	<b>nummay</b>	<b>nummay-taraχ</b>	
	e. Kazakh	<b>köp</b>	<b>köb-irek</b>	
	f. Mari	<b>šuko</b>	<b>šuk-ərlak</b>	
	g. Khanty	<b>ar</b>	<b>ar-šäk</b>	
	h. Guaraní	<b>heta</b>	<b>heta-ve</b>	
	i. Klon	<b>ubei</b>	<b>mi-ubei</b>	
	j. Evenki	<b>kete</b>	<b>kete-tmer</b>	

Note also that languages which form periphrastic comparatives also often use the same periphrastic formations to express English ‘more’, in the sense of the comparative of ‘many’:

(172)		POS	CMPR
	a. Romanian	<b>mult</b>	mai <b>mult</b>
	b. Albanian	i <b>shumë</b>	më <b>shumë</b>
	c. Turkish	<b>çok</b>	daha <b>çok</b>
	d. Mordvin	<b>lama</b>	sjada <b>lama</b>

The pervasiveness of this pattern is somewhat obscured in dictionaries, because of the polysemy of English *more*. Looking up English *more* in an English-Turkish or English-Albanian dictionary will yield single words such as *daha*, resp. *më*, but these are limited in their use to the ‘more’ that forms comparatives (as in: *more intelligent*, *more interesting*) and cannot be used to stand on their own as the comparative of ‘many’.

It seems abundantly clear, then, that UG allows for a regular derivation of comparative ‘more’ from (the root of) ‘many’ or ‘much’. For languages that

have such a derivation underlyingly, suppletion may arise in the comparative (and superlative, if applicable) and the CSG should hold. The question that we are considering here is whether UG permits of an alternative relationship, one in which at least some apparent cases of suppletion are in fact the conflation of a non-comparable quantifier and an inherently comparative MORE, with no derivation linking the two. I can do little more than scratch the surface of this here, but I note that the very robustness of the CSG for ‘more – most’ words in Table 4.2 may constitute an argument against this view. The fact that the CSG holds of the quantifier domain, with a large number of cognate sets, and no genuine exceptions (if my accounts of Karelian, Armenian and Bulgarian are correct) suggests itself as a non-accidental fact of language. If a monomorphemic counterpart to ‘more’ were indeed available, there would be no reason for the CSG to hold in this domain.

A more subtle version of this question is whether there may be a relationship between the quantifier and the comparative, but one that is more indirect than proper containment. It may be that an admissible derivation is as schematized in (173), modeled after the adverbial derivations in (??).<sup>28</sup>

$$(173) \quad \begin{array}{ccccccc} & \text{ROOT} & & \rightarrow & \text{MORE} & & \rightarrow & \text{MOST} \\ & \downarrow & & & & & & \\ & \text{QUANTIFIER} & & & & & & \end{array}$$

Although I will not pursue this line of analysis in this work, one reason for thinking that the relationship between the comparative and the quantifier may be less direct than with adjectives, and that there may be more (or different) structure in the quantifier words, is that quantifiers are not always adjectives, morphosyntactically. For example, in English, the quantificational expressions *a lot of*, *lots of* are nearly equivalent to ‘much, many’, and seem to enter into comparison with *more*, *most* (174a). Yet these expressions on the face of it have some additional (apparently nominal) structure, and thus seem to reflect a pattern like (173):

$$(174) \quad \begin{array}{ccccccc} & \text{ROOT} & & \rightarrow & \mathbf{mo-re} & & \rightarrow & \mathbf{mo-st} \\ & \downarrow & & & & & & \\ & \text{(a) } \mathbf{lot(s)} \text{ of} & & & & & & \end{array}$$

Similarly in Russian, quantifiers *mnogo* ‘many, much’, *malo* ‘little’, (also *skol’ko* ‘how many’ and derivatives with *ne-* ‘not’ have adverbial (or nominal) morphosyntax in nominative and accusative case (*mnog-* takes adjectival

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<sup>28</sup>But see note 12 in section 5.3.

morphology in oblique environments, while *mal-o* is excluded from oblique environments altogether (Garde 1998, 247)). In Bulgarian as well, the form *mnogo* (the source of the apparent problem in (165b), fails to inflect as an adjective. Tasseva-Kurktchieva (2006) provides an analysis of Bulgarian quantifiers and notes that they fall into two broad categories. The *modifying quantifiers*, are distinct from (what she calls) *proper quantifiers* (including *mnogo*) not only in that only the former have adjectival (concord) morphology, but the groups differ with respect to a number of both morphological and syntactic diagnostics, including co-occurrence with definite articles, possessive clitics, and demonstratives, as well as extraction patterns. If Bulgarian *mnogo* should therefore be described in terms of the derivation in (173), it could be modeled as an instance of the abstract pattern in (162) in the previous section. The root may exist only in the abstract, with no default realization, while quantifier and superlative are accidentally homophonous in a manner that is permitted (theoretically) as neither is the default, and neither properly contains the other.

If there are indeed quantifiers that have additional (possibly covert) internal structure, and instantiate the pattern in (173) as regards comparison, then these quantifiers would lie outside the reach of the theory presented here, by parity of reasoning to the discussion of *well – better – best* surrounding example (157). Apparent ABA patterns would not be problematic, but it would then be a mystery why the overwhelming majority of patterns in this domain are ABB patterns, entirely as expected under the CSG.



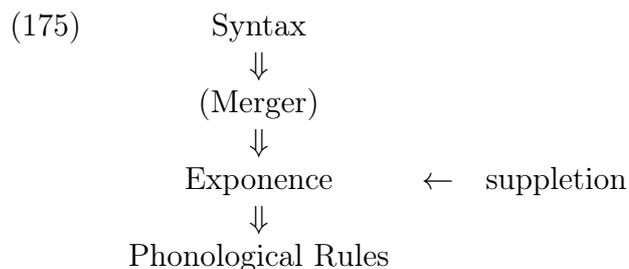
# Chapter 5

## Theoretical Refinements

### 5.1 Introduction: Taking Stock

In the theory developed thus far, two assumptions are of paramount importance.

The first is an assumption about the architecture of the grammar, namely, Late Insertion, i.e., that morphology is Realizational. The syntax generates a hierarchical arrangement of abstract morphemes, which are then subject to rules of exponence, which match (underlying) phonological representations to terminal nodes, as in (175), with the additional operation of Merger included, which occurs post-syntactically, but feeds vocabulary insertion/exponence:



This theoretical architecture allows for competition among exponents (vocabulary items), regulated by the Elsewhere Principle, and allowing suppletion to be treated as a special case of contextual allomorphy. The English exponents *good* and *bett-* (with orthography standing in for more accurate phonological representations, of course) compete to realize the abstract adjectival root GOOD, with *bett-* winning out wherever its context is met.

- (176) a. GOOD → bett- /     ] CMPR  
 b. GOOD → good

The second assumption is an empirical one, namely the containment hypothesis, repeated here.

- (58) The Containment Hypothesis  
 The representation of the superlative properly contains that of the comparative.

Chapter 2 laid out the reasoning that runs from these assumptions to the CSG, discussed at length in the preceding chapters.

- (33) The Comparative-Superlative Generalization (CSG):  
 If the comparative degree of an adjective is suppletive, then the superlative is also suppletive (i.e., with respect to the positive).

In Chapter 3, I added the assumption that the theory of morphology includes a locality restriction on the relation on possible contexts for suppletion. As a working hypothesis, I suggested that locality prevents a node  $\beta$  from serving as the context for allomorphy of a node  $\alpha$  if a maximal projection (or other designated intervenor, see Embick 2010) intervenes between them, as in (89):

- (89) a.  $\alpha \dots ]_{X^0} \dots \beta$   
 b.  $*\alpha \dots ]_{XP} \dots \beta$

The assumption in (89) derives the RSG in (87), and also anchors the account (together with some ancillary assumptions) of the SSG in (88).

- (87) The Root Suppletion Generalization (RSG)  
 Root suppletion is limited to synthetic (i.e., morphological) comparatives.  
 (88) The Synthetic Superlative Generalization (SSG)  
 No language has morphological superlatives (*X-est*), but only periphrastic comparatives (*more X*).

The two general theoretical assumptions are drawn from the existing literature and have broad consequences beyond the morphological phenomena investigated here. The assumption of Late Insertion is at the core of

the framework of Distributed Morphology and is supported by a significant amount of evidence in that framework. Almost all work invoking competition among (potentially) underspecified exponents requires some version of this hypothesis (although not all frameworks take the input representation to be the output of the syntax). Similarly, the locality assumption underlying the RSG is not in any way specific to comparatives, but must be a special case of a more general theory of locality in morphology. The RSG should thus find parallels in restrictions on analytic-synthetic alternations generally. In English, for example, where tense and agreement are expressed synthetically in a simple declarative, but analytically in negatives and (non-subject) interrogatives, the locality condition ensures that suppletion is limited to the synthetic forms ((177) versus (178)).

(177) a. Leo goes swimming on Sundays.

b. Leo went swimming on Sunday.

(178) a. Did Leo go swimming on Sunday?

b. Leo didn't go swimming on Sunday.

An underlying assumption here is that root suppletion in verbs is formally characterizable in the same manner as in adjectives, thus:

(179) a. GO → wen- / \_\_\_ ] PAST  
 b. GO → go

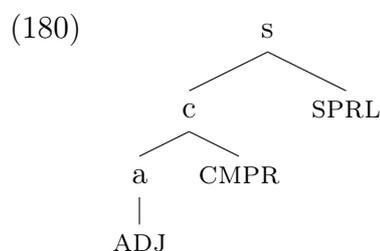
On this assumption, the analysis parallels that of (176) – the suppletive allomorph is selected when the conditioning feature is an affix (179a), but not when the conditioning feature is expressed periphrastically, with a word boundary intervening.

The Containment Hypothesis is, of course, specific to comparatives and superlatives, by definition, and I have devoted a significant part of Chapter 3 to arguing that it is robustly supported, independently of the CSG.

Having presented and defended the theory in broad outlines, the remainder of this chapter is devoted to some refinements in detail, and some qualifications, picking up on some threads left open in previous chapters.

## 5.2 Conditions on Suppletion: exponence versus readjustment

In the derivational architecture in (175), rules of exponence provide the phonological form to the abstract morphemes. Assuming that insertion applies cyclically, beginning with the root, the architecture derives a version of the *No Lookahead Condition* of Simpson and Withgott (1986) or the *Peripherality Condition* of Carstairs (1987); see (Bobaljik 2000b, Chung 2007b, Embick 2010). Consider this with reference to a concrete structure, namely (180), the structure taken to be the input to vocabulary insertion, after the application of syntax and Merger:



Insertion applies first at the most deeply embedded node, namely, the adjective root. At this point in the derivation, the morphosyntactic identity of the more peripheral nodes (CMPR) is knowable, and (at least the adjacent node, see below) may thus condition allomorphy, as in (176a), above. In terms of the morphosyntactic representation, the Containment Hypothesis ensures that the superlative is, morphosyntactically, but a special case of the contexts in which this structural description is met, and thus any rule of exponence specified as occurring ‘in the comparative’ will also apply in the superlative, unless blocked by a more specific rule. This consideration anchors the account of the CSG. Subsequent cycles of vocabulary insertion provide (possibly null) phonological exponents for the the more peripheral nodes in (180).<sup>1</sup>

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<sup>1</sup>In Bobaljik 2000a,b I argued that rules of exponence are rewrite rules, rather than information-preserving rules as in Halle and Marantz (1993). This has implications for what information may be available to condition allomorphy at the point where non-root nodes are subject to vocabulary insertion. As our focus here is insertion at roots, these additional questions are not directly relevant. For a variety of contrasting views on this topic, see Carstairs-McCarthy (2001, 2003), Adger et al. (2003), Chung (2007b), Bonet and Harbour (To appear), Embick (2010).

The output of the rules of exponence (and, other morphological operations, perhaps including bracket erasure and linearization of the structure) constitutes the input to the phonological component. One class of phonological rules includes the unproductive *readjustment* rules which effect irregular changes to the phonology, including unpredictable vowel alternations (*tell* – *tol-d*) and the like (see ?? within the DM framework, and numerous antecedents). In theory, there is a sharp division of labour between rules of exponence and readjustment rules. The former introduce distinct underlying representations, in the case at hand, distinct roots, into the derivation, while the latter perform manipulations on a previously introduced root. Of course, there is a difficult grey area for the analyst in establishing just where the boundary lies — alternations like *many* – *mo-re* could be treated formally as suppletion (with synchronically accidental initial *m-* in both allomorphs) or as the output of a very powerful readjustment rule, rewriting the syllable rime (cf. Halle and Marantz 1993 on English verbal morphology). If the theoretical distinction is correct, then establishing the boundary, and the limits of the power of readjustment, is ultimately an empirical matter. For present purposes, I take the conservative position of counting the examples in the grey area as instances of suppletion, to ensure that no problematic cases for the CSG are inadvertently swept under the rug of overly powerful readjustment rules.

Since phonological rules, including readjustment rules, apply after the rules of exponence (perhaps with some measure of cyclic interleaving, though this is irrelevant as far as roots are concerned), there is no a priori expectation that the CSG (or a suitably worded extension thereof) would hold of irregular comparatives. And it is indeed the case that irregulars may display a range of surface patterns, including patterns not permitted to suppletive derivations. The Classical Greek examples in (181) serve to illustrate this difference. The triads for ‘good’ and ‘few’ are suppletive, and constitute ABB patterns (for other forms for ‘better, best’ see (142)), but in the triads for ‘big’ and ‘swift’, if one looks only at the surface forms of the root, the comparative constitutes the odd one out.

(181)		POS	CMPR	SPRL	
	a. Anc. Greek:	<b>agath</b> -ós	<b>belt</b> -íōn	<b>bélt</b> -istos	‘good’
	b. Anc. Greek:	<b>olíg</b> -os	<b>elátt</b> -ōn	<b>elách</b> -istos	‘few’
	c. Anc. Greek	<b>meg</b> -as	<b>meiz</b> -ōn	<b>meg</b> -is-tos	‘big’
	d. Anc. Greek	<b>tach</b> -us	<b>thass</b> -ōn	<b>tach</b> -is-tos	‘swift’

The forms in (c) and (d) involve no competition among exponents. The surface form *meizōn* is derived from underlying *meg-iōn* by a rule of palatalization.<sup>2</sup> As far as the rules of exponence (and thus the CSG) are concerned, the phonologically irregular patterns in (181c-d) are morphologically regular, instances of the AAA pattern, with a single root form occurring underlyingly in all three grades.

The key work in explaining the CSG is done by the elsewhere ordering, which relies on subset-superset relations among (the structural descriptions of) rules. The architectural concerns discussed above effectively limit suppletive rules (rules of exponence) to morphosyntactic contexts, forcing the CSG.<sup>3</sup> But no such limitation is imposed on phonological (including readjustment) rules, and thus whether a rule that effects a change in the comparative root will extend to the superlative depends on the relation between the structural description of the rule and the representation of the superlative. The palatalization rule refers to a (*morpho-*)*phonological* context, applying only when the triggering palatal is prevocalic. Since the underlying palatal was prevocalic in the comparative *\*-jōs*, but not in the superlative formatives *-istos* (Greek) and *-issimus* (Latin < *-ismmos*), there is no superset-subset relation between the phonologically-defined environments, and no expectation that the ‘comparative’ form would spread beyond the comparative.

While (surface) ABA patterns may be derived by readjustment rules applying to a unique underlying root (as in (181c-d)), irregulars may therefore also show ABB patterns where both the superlative and the comparative meet the environment for some rule. For example, palatalization of

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<sup>2</sup>See Kinchin Smith and Melliush (1968, 187); a similar rule applies in Latin, thus: *mag-nus* ‘big’, comparative *maiōr* = /majjōr/ < *\*mag-jōs* (Weiss 2009, 359). The theory pursued here treats the established reconstructions as constituting derivations from underlying to surface representations in the synchronic phonology of Latin and Ancient Greek.

<sup>3</sup>It is clear how the architecture in (175) excludes root allomorphy conditioned by morphophonological contexts. A trickier case is to exclude reference to the word-boundary symbol, as in (i), suggested by Danny Fox. This would allow reference to the comparative, to the exclusion of the superlative.

i. / \_\_\_ ] CMPR ] #

It may be that the word-edge symbol # is a part of the morphophonological symbol inventory, not present at the stage of the derivation where root exponence occurs. In addition, the considerations of locality in the next section may also be relevant for excluding this configuration.

stem-final consonants is triggered by the initial palatal of the comparative in Slavic; since the superlative is transparently built on the comparative (except in Bulgarian-Macedonian), the context for the palatalization rule is met in both environments:

(182)	POS	CMPR	SPRL	
a.	<b>dug</b>	<b>duž-i</b>	na.j- <b>duž-i</b>	‘long’
b.	<b>brz</b>	<b>brž-i</b>	na.j- <b>brž-i</b>	‘fast’
c.	<b>mlad</b>	<b>mladž-i</b>	na.j- <b>mladž-i</b>	‘young’

Consider also German umlaut, which is characterized in the framework adopted here as a readjustment rule (Halle and Marantz 1993). Though historically phonological, the structural description of this rule is (synchronically) morphologically defined – certain roots are specified to undergo umlaut in the presence of the comparative morpheme. If this rule makes reference to the abstract morpheme CMPR, then the umlaut pattern should extend to the superlative as well, given the containment hypothesis. This is, of course, what happens, with adjectives showing a consistent pattern between comparative and superlative:

(183)	POS	CMPR	SPRL	
a.	<b>hart</b>	<b>härt-er</b>	(am) <b>härt-est-en</b>	‘hard’
b.	<b>zart</b>	<b>zart-er</b>	(am) <b>zart-est-en</b>	‘tender’
c.	<b>schwach</b>	<b>schwäch-er</b>	(am) <b>schwäch-st-en</b>	‘weak’
d.	<b>wach</b>	<b>wach-er</b>	(am) <b>wach-st-en</b>	‘awake’

The correctness of the CSG, and the lack of an analogous generalization for irregulars, may thus constitute indirect evidence in favour of a theory (such as DM) that draws a strict distinction between suppletion and readjustment, as against frameworks in which all synchronically irregular root allomorphs are held to be, in essence, special cases of suppletion (Wurzel 1985, Anderson 1992 and more recently, Bonet et al. 2007 and related work).<sup>4</sup> I

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<sup>4</sup>Wurzel (1985) treats suppletion as a cline, and includes German *hoch* – *höher* – *am höchsten* [hox] – [hœ-er] – am [hœç-sten] ‘high – higher – highest’ as a canonical instance of ‘weak’ suppletion, in virtue of the irregularity of fricative deletion in the comparative; compare *schwach* – *schwächer* – *am schwächsten* ‘weak – weaker – weakest’. Setting aside vowel quality (umlaut), and the fully predictable [x] ~ [ç] alternation, if this *hoch* pattern is treated as suppletive, then this would appear to be an ABA pattern. In the theory considered here, the *hoch* pattern is of course (merely) irregular.

do note, though, that the restriction of suppletion to morphosyntactic environments remains controversial, with some recalcitrant challenges. Carstairs (1987, 1988) argued that there are cases of phonologically governed suppletion, most notably the Italian verb *andare* ‘go’, which is built on the root *va(d)-* when stress falls on the root, e.g., 1SG *vád-o*, but on *and-* when unstressed, as in 1PL *and-iámo*. Although the distribution correlates with stress placement in this case, it is not possible to demonstrate empirically that the suppletion is conditioned by stress, since the environments in which the root is or is not stressed, and hence the distribution of suppletion can also be characterized (albeit with some clunkiness) in morphological terms (1SG, PL ...), and thus some authors have argued that this case is not phonologically conditioned after all. Particularly relevant in this regard is Maiden (2005) and related work, which argues for that the suppletive patterns are a special case of a broader morphological patterning that is consistent across a range of Romance varieties, even where the pattern does not have clear-cut non-morphological correlates like stress. While the majority of cases of apparent phonologically-governed suppletion fall to alternative analyses in this way, more difficult case, which I leave unresolved for now, is the variety of Surmiran (Rumantsch) discussed in Anderson (2008).<sup>5</sup>

### 5.3 Adjacency, \*AAB, ABC

Another controversial issue regarding the conditioning environments for suppletion concerns the postulation of an adjacency condition (see Chapter 2). In the following subsections, I return to the role that condition plays in the account, attempting to shed light on a delicate interaction between adjacency and portmanteaus, and then, for completeness, add a few remarks on

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<sup>5</sup>Although it is related to the Romance varieties for which a phonological solution is not supported, Anderson argues that stress, rather than morphological patterning, is the determining factor for stem alternations in Surmiran, on the basis, for example, of differences in stem form in the infinitive depending on whether the root is stressed (infinitives in *-ər*) or unstressed (infinitives in *-Vr*; with non-schwa *V*). At worst, phonologically-governed suppletion would require either a revision to the relationship between rules of exponence and other phonological rules in (175), or a re-consideration of the limits of the power of readjustment rules. Since the theory developed here relies on the Elsewhere principle, the considerations for phonologically-conditioned suppletion, if it exists, are analogous to the discussion of irregulars — the CSG is predicted to hold wherever the relevant subset-superset relations hold of conditioning environments.

outstanding problems with invoking adjacency.

In Chapter 2, I suggested that there is also an adjacency (or contiguity) condition on allomorphy, such that the trigger for suppletive allomorphy must be adjacent to the root that undergoes allomorphy. Such a condition would exclude (184a) (= (44a)) as a possible context for root suppletion (since the comparative intervenes, by the Containment Hypothesis).<sup>6</sup>

- (184) a. GOOD → be(tt)- /     | sprl |  
 b. GOOD → good

The adjacency condition, in tandem with the central assumptions of Chapter 2 serves to derive the following typology of possible suppletive patterns:

(185)		POS	CMPR	SPRL	
	a. regular	A	A	A	<i>big – bigger – biggest</i>
	b. suppletive	A	B	B	<i>good – better – best</i>
	c. doubly-suppletive	A	B	C	<i>bonus – melior – optimus</i>
	d. unattested	A	B	A	<i>*good – better – goodest</i>
	e. unattested	A	A	B	<i>*good – gooder – best</i>

However, I left open in Chapter 2 what the formulation of adjacency would need to be so as to exclude \*AAB, but without incorrectly excluding the unattested ABC patterns as in Latin and Welsh. Examples from Chapter 2 are repeated here:

(186)		POS	CMPR	SPRL	
	a. Latin:	<b>bon-us</b>	<b>mel-ior</b>	<b>opt-imus</b>	‘good’
	b. Welsh:	<b>da</b>	<b>gwell</b>	<b>gor-au</b>	‘good’
	c. Old Irish:	<b>maith</b>	<b>ferr</b>	<b>dech</b>	‘good’

The main import of the ABC patterns is that they illustrate the logic of the Elsewhere reasoning, in particular, the observation that the ABB pattern will be the default suppletive pattern unless the comparative root allomorph

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<sup>6</sup>As a further consequence, the adjacency condition precludes comparative allomorphy of roots where the adjectival stem is internally complex. For example, if an adjective like *happy* is internally complex with a suffix *-y*: [ [ happ ] y ], then root allomorphy in the comparative [ [ [ happ ] i ] er ] is precluded. Compare, for example, *good-ly – good-li-er – good-li-est*. I have not investigated this prediction in detail, but know of no problematic cases.<sup>7</sup>

is overridden by a more specific exponent in the superlative. It must therefore be possible for root suppletion to be conditioned by the superlative. Above, this was formalized as in (187) corresponding to the Welsh example in (186b) (cf. Latin (41) from Chapter 2).

- (187) a. GOOD → gor- /     | CMPR | SPRL |  
 b. GOOD → gwell /     | CMPR |  
 c. GOOD → da

The challenge here is to ensure that whatever formalism is used in (187a), allowing the superlative root allomorph to bleed the comparative, is unavailable in cases like (184a), which would falsely admit AAB patterns. In other words, to derive the CSG2, what we need to ensure is that the presence of a suppletive allomorph in the superlative (as in (187a) for a given root ensures that the same root also has a suppletive comparative allomorph (41b). In the following paragraphs, I suggest an approach to deriving this generalization, drawing in part on ideas about the treatment of portmanteau morphemes in Radkevich (2010).

### 5.3.1 Getting *worse*: portmanteaus and locality

I start with some theoretical housekeeping, taking the position that adjacency is the right condition to exclude (184a) and thus that the clunky statement of the context in (187a), representing the C case of an ABC pattern, needs to be reconsidered. Now, it happens that the few clear cases of superlative allomorphs participating in ABC patterns lack an overt exponent of the comparative. To be sure, the number of ABC cases is too small to be confident that this is more than an accident, and I have had recourse to a zero allomorph of the comparative within the superlative (in 42). Nevertheless, I suggest that the root allomorph *gor-* in Welsh (and likewise Old Irish *dech* and Latin *opt-* are portmanteaus, expressing both the adjective root and the comparative.

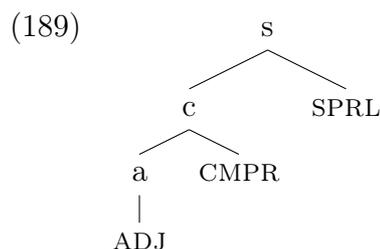
In the previous chapters, I did not dwell at any length on the distinction between (i) cases of clear contextual allomorphy (such as *bett-er*) in which the root is suppletive, but the structure is otherwise as expected, with the comparative morpheme following the root, and (ii) cases of portmanteau allomorphy, in which the suppletive form replaces not only the root, but also the expected affix, as in *worse* (not *worse-r*). I have simply treated the latter as a special case of contextual allomorphy of the root, with a concomitant

lexically conditioned null allomorph of the comparative: *worse*+ $\emptyset$ . It is time to revisit the *worse* case.

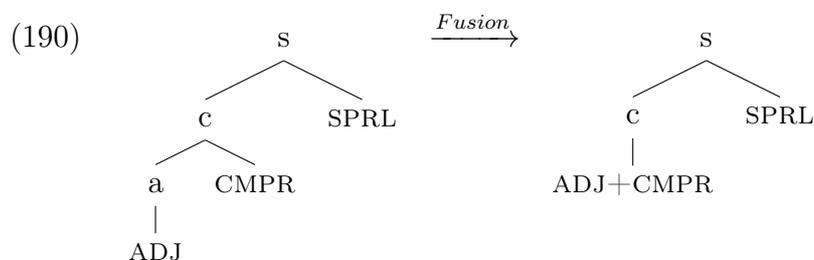
The toolbox of Distributed Morphology contains an alternative means of characterizing *worse*-type portmanteau suppletion. Specifically, rather than posit that *worse* is the spell-out of the adjective root BAD alone, *worse* may spell out both root BAD and the feature CMPR simultaneously, as in (231):

- (188) a. BAD, CMPR  $\rightarrow$  worse  
 b. BAD  $\rightarrow$  bad

The vocabulary items in (231) differ from those in (197) in the location of the element CMPR. This difference does not affect the applicability of the Elsewhere reasoning which establishes an intrinsic ordering among these exponents, and makes no changes to the main theoretical proposals in this book. However, the vocabulary item in (231a), unlike that in (197a), may serve as the spell out of the higher node *c* in (189) (= (180)), with no appeal to a zero comparative allomorph (42) in the comparative or superlative in this case.



The current literature provides at least two ways to flesh this out concretely, and deciding between them is not relevant for present concerns. Early DM provides for an operation of *Fusion*, which joins two sister nodes into a single node with the combined features of both (see Halle and Marantz 1993, Bobaljik 1997, Embick and Noyer 1999, Chung 2007a). Fusion of CMPR and *a* in (189) is schematized in (190); the fused node is a single locus of vocabulary insertion.



An alternative formalism proposed by Radkevich (2010) is to admit insertion directly at non-terminal  $X^0$  nodes (see also Caha 2009), i.e., directly at node  $c$  in (189) without the intermediate operation of Fusion. In order to prevent many kinds of unwanted over-application of insertion, Radkevich also proposes to reformulate the standard version of vocabulary insertion as in (191):

- (191) The Vocabulary Insertion Principle (VIP)  
 The phonological exponent of a vocabulary item is inserted at the minimal node dominating all the features for which the exponent is specified.<sup>8</sup> (Radkevich 2010, 8)

For current purposes, the Fusion and VIP proposals are equivalent. The relevant consideration here is that, one way or another, portmanteaus may be characterized as insertion at a node dominating multiple features, corresponding to multiple terminal nodes at some stage of the derivation. With Fusion or the VIP at our disposal for describing portmanteau morphemes, we may return to the Welsh ABC case, dispensing with the clunky statement of the context in (187a), and replacing it instead with the clearly adjacency-satisfying allomorphy in (192a).

- (192) a. GOOD, CMPR → gor- /     ] SPRL ]  
 b. GOOD, CMPR → gwell  
 c. GOOD → da

The Elsewhere Condition applies as before, ensuring the ordering among exponents. Moreover, assuming that adjacency restricts suppletion forces the superlative in ABC patterns to involve portmanteau exponence of  $\sqrt{\text{ROOT}} + \text{CMPR}$ , since it is only the node dominating both of these that is adjacent to the CPRL node. As noted above, this consequence is consistent with all the ABC cases.

As a brief aside, we may note that this approach to portmanteau suppletion yields the general prediction in (193):

- (193) If an exponent  $X$  expresses  $\sqrt{\text{ROOT}} + F_1 \dots F_n$ , for some features  $F_1 \dots F_n$ , then  $F_1 \dots F_n$  must be contiguous to  $\sqrt{\text{ROOT}}$ .

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<sup>8</sup>A node  $\alpha$  is the minimal node dominating features  $F_1 \dots F_n$  iff  $\alpha$  dominates  $F_1 \dots F_n$  and there is no node  $\beta$  such that  $\alpha$  dominates  $\beta$  and  $\beta$  dominates  $F_1 \dots F_n$ .

The empirical content of this prediction is that, all else being equal, if there are portmanteaus expressing  $\sqrt{\text{ROOT}}_1 + F_1$  in some language, then for non-portmanteau roots,  $\sqrt{\text{ROOT}}_2$  and  $F_1$  will be adjacent (and where the portmanteau includes a group of features, these will be contiguous with the root).

Radkevich (2010) argues that this prediction is borne out by the large survey of verbal suppletion in Veselinova (2006). A well-substantiated generalization in affix order is that (direction of affixation aside) aspect morphemes are closer to the root than tense morphemes, which are in turn closer than mood morphemes ((Bybee 1985, Cinque 1999, Julien 2002)). Structurally, this can be represented as in (194):

(194) [ [ [ [ ROOT ] ASPECT ] TENSE ] MOOD ]

Portmanteau expression of  $\sqrt{\text{ROOT}} + \text{ASPECT}$  is admitted by the theory, and well attested. (Radkevich counts xx cases in Veselinova's survey). Portmanteau expression of  $\sqrt{\text{ROOT}} + \text{TENSE}$  should be disallowed by (193) in the general case, but it is allowed if either (i) there are no aspect morphemes in the domain in question (hence tense is adjacent to the root) or (ii) the portmanteau expresses  $\sqrt{\text{ROOT}} + \text{ASPECT} + \text{TENSE}$ , i.e., a contiguous sequence of heads, corresponding to a single (complex) node in (194). Radkevich reports that this is indeed the case in Veselinova's survey (and likewise for portmanteaus that include mood).

Confirmation of this prediction stands as independent support for an approach to portmanteau suppletion that incorporates a hierarchical arrangement of morphosyntactic features independent of (and prior to) the rules of exponence that realize these features.<sup>9</sup> This is because the prediction relies on a hierarchical arrangement of the features, prior to the rules of exponence that realize these features. Theories that deny such an arrangement (notably Word-and-Paradigm theories such as Anderson (1992), Stump (2001)) are, it seems, unable to accommodate generalizations of this sort.

Returning to the issue at hand, although I have just shown how the ABC pattern may be profitably described while maintaining an adjacency condition on allomorphy, this alone does not suffice to exclude the AAB pattern. Consistent with what has been said thus far, it should be possible

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<sup>9</sup>The prediction from adjacency is distinct from the prediction regarding the relative frequency of occurrence of stem alternations with the different types of trigger, as discussed in Bybee (1985) with respect to this hierarchy.

to have a Welsh-like system, but with only two root allomorphs for GOOD, as in (195):

- (195) a. GOOD, CMPR → gor- / \_\_\_ ] SPRL ]  
 b. GOOD → da

This vocabulary will derive the unattested AAB pattern. I suggest that the following condition holds:

- (196) If there is a context-sensitive rule of exponence involving a node  $\alpha$ , then there is a context-free rule of exponence involving  $\alpha$ .

For the basic case, this entails that if a root has a suppletive allomorph, then that root also has a corresponding default form. The vocabulary entry in (197a) (= (176a)) is permissible, just in case there is also a context-free form (197b).<sup>10</sup>

- (197) a. GOOD → bett- / \_\_\_ ] CMPR  
 b. GOOD → good

The motivation for (196) may lie in the process of acquisition, in essence, allowing for the acquisition of a contextually restricted allomorph of some morpheme  $\alpha$  only after  $\alpha$  itself has been acquired. The intuition is thus reminiscent of leading ideas in Pinker (1984), in particular the discussion there of the acquisition of paradigm structure (see also remarks on markedness in Noyer 1998 and Calabrese 2005).<sup>11</sup>

The pair of exponents (192a) and (192b) constitute context-sensitive and context-free allomorphs, competing for the expression of a single node, node  $c$  in (189). This pair of rules is thus permitted under (196). Now consider the relation between (192b) and (192c), which is exactly parallel to that between *worse* and *bad* in (231), repeated here. The condition in (196) is intended to cover (231) in the same way it covers (197).

<sup>10</sup>This excludes the treatment of “defective paradigms” (adjectives having comparative and/or superlative forms but no positive) as simply lexical gaps. For example, English *rather*, which is a comparative, but lacks a corresponding positive, could not be treated simply in a manner parallel to (197a).

<sup>11</sup>This is not to say that the “word” *better* cannot be acquired before the adjective *good*. Rather, it is a narrower claim, namely, that *better* can only be understood as the suppletive comparative of *good* after *good* has been learned. There is anecdotal evidence at least that English children might learn forms like *better* first as an intensive adjective, see Ohtaki (2010) and references there.

- (231) a. BAD, CMPR → worse  
 b. BAD → bad

To ensure that this pair satisfies (196), we may understand that condition such that rule (231b) applies to (thus involves) node  $a$  [ $\sqrt{\text{BAD}}$ ] directly, while the portmanteau rule (231a) affects (and thus involves) that same node, but in a context-sensitive manner, that is, only when  $a$  is the immediate context of the CMPR) node.

Understood in this way, (196) thus permits (192) (and (231)). By contrast (195), which would derive an AAB pattern ( $da - da-ch - gor-au$ ), is not permitted under (196). Rule (195a) provides a context-sensitive exponent for the node [GOOD, CMPR] (node  $c$  above), but there is no corresponding context-free rule for the node [GOOD, CMPR] (even though there are entries for its components).

Thus, (196), when coupled to the fusion or VIP treatment of portmanteaus, makes the right cut among attested (ABC) and unattested (AAB) patterns of superlative suppletion.

Latin makes the same point with a minor twist. The comparative *melior* is clearly bi-morphemic, containing the regular comparative affix *-ior*. Assuming that this segmentation is synchronically part of Latin grammar, then *opt-* can be treated as a portmanteau (resolving the adjacency issue), but *mel-* cannot be made parallel to (192b), requiring instead (198).

- (198) a. GOOD, CMPR → opt- /  $\underline{\quad}$  ] SPRL ]  
 b. GOOD → mel- /  $\underline{\quad}$  ] CMPR ]  
 c. GOOD → bon

Here again, (196) makes the right cut. The pair of rules in (198b-c) is exactly parallel to (197) discussed above. In turn, the pair in (198a-b) both involve the node  $c$  dominating the adjective root and the comparative, with only the rule in (198a) sensitive to an additional context beyond that node.

In sum, combining the treatment of portmanteaus via Fusion or Radkevich's VIP with the assumption in (196) cleans up an issue left unresolved in earlier chapters, ensuring that the account of the ABC patterns is consistent with the assumptions that exclude the unattested \*AAB pattern.<sup>12</sup>

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<sup>12</sup>Incidentally, (196) turns out to exclude the hypothetical derivation in (173) considered, but not adopted, in section 4.3.

### 5.3.2 Adjacency - Outstanding Issues

An adjacency condition on suppletion is thus motivated within the current theory by the work it does in explaining the non-occurrence of AAB patterns (*\*good – gooder – best*). It is also reasonably well-motivated in the literature independently of comparatives (see Embick (2003, 2010)). In the realm of root suppletion, Radkevich (2010, 199-200) evaluated the instances of verbal suppletion discussed in Veselinova’s 2006 extensive study, and found that all examples of suppletion in that study conformed to the predictions of an adjacency account — none of the examples of suppletion presented in Veselinova (2006) involve a non-adjacent trigger.<sup>13</sup>

Nevertheless, there are apparent cases in the literature of allomorphy in non-adjacent contexts, an issue first brought under scrutiny in Carstairs (1987). For the current project, we may restrict our attention to cases involving root suppletion, putting aside cases of non-adjacent inwards-sensitivity in affixal allomorphy, such as the Itelmen class and agreement marking discussed in Bobaljik (2000a,b), as well as examples of non-adjacent application of readjustment rules.

One case to consider is Korean verbal suppletion, discussed in Chung (2009). In Korean, some verbs show suppletion for negation (*al-* ‘know’, *molu-* ‘not know’), while others show suppletion for honorification (*mek-* ‘eat’, *capswu* ‘eat (honorific)’). One verb shows three-way suppletion (*iss-* ‘exist’, *eps-* ‘not.exist’, *kyey-* ‘exist (honorific)’). The negative suppletive forms are portmanteaus, replacing both the root and the regular marker of negation (which is prefixal). The honorific forms involve contextual allomorphy and obligatorily cooccur with the regular honorific suffix.

- (199) a. eysute-ka ttek-ul mek-ess-ta.  
Esther-NOM rice cake-ACC eat-PST-DCL  
‘Esther ate rice cake (non-honorific).’
- b. apeci-kkeyse ttek-ul capswu-\*(si)-ess-ta.  
father-HON.NOM rice cake-ACC eat.HON-HON-PST-DCL  
‘Father ate rice cake (honorific).’

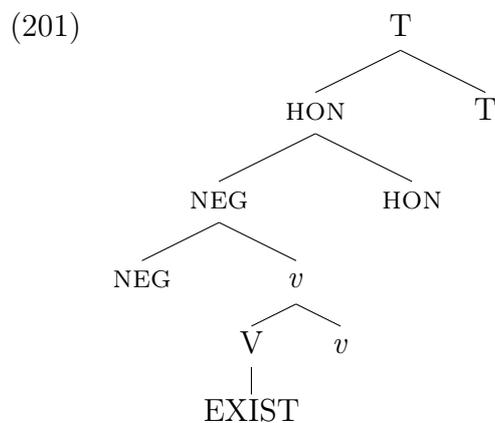
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<sup>13</sup>Radkevich understood adjacency as overt string adjacency, or contiguity in the case of portmanteaus expressing multiple features, for the purposes of her study. Additional work would be needed to see whether the more restrictive requirements of the combination of adjacency and (??) are supported.

Although the verbal root and honorific suffix are string adjacent, Chung gives two careful arguments that they are not structurally adjacent. One argument comes from the interaction of the two types of suppletion. Negative suppletion in Korean is shown to require structural adjacency (Chung 2007b), but honorific root allomorphy bleeds negative suppletion. For the one verb that undergoes both types of suppletion, the only possible form for a negative honorific is to combine regular negation with the honorific root allomorph:

- (200) a.   apeci-kkeyse     silhemsil-ey an(i) kyey-si-ta.  
           father-HON.NOM lab-LOC     NEG exist.HON-HON-DCL  
           ‘Father is not in the lab (honorific).’  
       b.   \*apeci-kkeyse     silhemsil-ey eps-u-si-ta.  
           father-HON.NOM lab-LOC     not.exist-V-HON-DCL  
       c.   \*apeci-kkeyse     silhemsil-ey an(i) iss-u-si-ta.  
           father-HON.NOM lab-LOC     NEG exist-V-HON-DCL

Including a further argument regarding the presence of a *v* head, Chung argues that the structure of the Korean verb is as in (201):



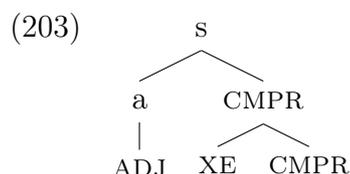
In this structure, the suppletion in (200a) thus takes place in a context of structural non-adjacency. Admitting a parallel analysis in the realm of superlatives would open the door to unattested AAB patterns, which could be characterized as (184a). Despite the elegance of Chung’s solution, it is conceivable that the alternations characterized as honorific suppletion are not instances of grammatical suppletion as such, but are rather lexical, with two verbs in play: *capswu-* ‘to eat (of an honorific agent)’ and *mek-* ‘to eat’.

Compare, for example, German *fressen* ‘to eat (of animals)’ versus *essen* ‘to eat’ and many similar cases.

A more serious problem arises closer to home, as it were, with Basque comparatives once again. Basque *on* ‘good’ has a suppletive comparative *hobe* ‘better’, which appears, like English *worse* to occur without the comparative suffix (Basque: *-ago*). As noted in section 3.2.2, Basque has a morphological means of creating a comparative with the meaning ‘a little more X’, created by intercalating the morpheme *xe* between the adjective root and the comparative suffix. As (202) illustrates, there are two points to notice here. First, suppletion occurs in the *xe-ago* forms just as in the regular comparatives, and second, the regular suffix *-ago* reappears in the (c) example even with the otherwise portmanteau-like root *hobe* (examples from de Rijk 2008, 710-711).

- (202)            ‘much’            ‘good’  
 a.    asko            on  
 b.    gehi-ago        hobe  
 c.    gehi-xe-ago    hobe-xe-ago

In section 3.2.2 I argued that semantic considerations here support an analysis of the *xe-ago* forms invoking a branching affix structure, perhaps required in any event for a few Fennic varieties, thus (203):



In this structure, the roots are adjacent to a projection of the node CMPR and thus these examples are consistent with the adjacency condition on allomorphy. The reappearance of *-ago* in (202c) suggests that *hobe* should be treated not as a portmanteau, but rather as an instance of garden-variety contextual allomorphy, with a concomitant zero allomorph of the comparative lexically conditioned to occur under adjacency with this root. Even if insertion at non-terminal  $X^0$  nodes is possible, as entertained above, the VIP (191) will ensure that the comparative exponent *-ago* realizes the lower CMPR node in (203), where it is not adjacent to the root, even where the root is, in morphosyntactic terms, adjacent to the comparative. Thus the distribution of *-ago* versus  $\emptyset$  in the ‘good’ forms is readily accommodated.

Unfortunately, there is a further complication in Basque. In sec 4.2, I noted variation across languages in the order of morphemes deriving adverbs from adjectives, with respect to the comparative marker, as in (204).

- (204) a. Karelian, Georgian [ [ [ ADJECTIVE ] COMPARATIVE ] ADVERB ]  
 b. Basque [ [ [ ADJECTIVE ] ADVERB ] COMPARATIVE ]

Where the pieces are overt, Basque clearly has the structure in (204b); on semantic grounds there is no reason to consider a branching affix structure here:

- (205) berri            berri-ki    berri-ki-ago  
 new                new-ADV   new-ADV-CMPR  
 ‘new, fresh’ ‘recently’ ‘more recently’

Corresponding forms for ‘good’, resp. ‘well’ are given in (??):

- (206) on            on-gi            hobe-ki  
           on            on-do            hobe-to  
           good        good-ADV    better-ADV  
           ‘good’    ‘well’        ‘better (adv)’

The occurrence of the suppletive root and the absence of the overt comparative affix in the adverbial form for ‘better’ both suggest (given the discussion above) that the comparative is underlyingly adjacent to the adjectival root, but in non-suppletive forms, where the comparative is overt, it occurs peripheral to the adverbial marker.

In sum, whether adjacency constrains (root) suppletion, and if so in what form, is thus an important piece of the overall puzzle, which I leave as currently unresolved. The bulk of the evidence seems to indicate that there is a role for an adjacency condition, but the Korean and Basque puzzles remain to be solved before we can consider this point established.

## 5.4 AAB ablaut

In discussing the CSG and CSG2 (the impossibility of the ABA and AAB patterns, respectively), I have kept the two pieces of the generalization distinct. The Containment Hypothesis and Elsewhere ordering are central to the account of both, while the Adjacency Condition plays a role only in the

CSG2. Nothing beyond expository convenience is intended by keeping the generalizations distinct in this manner — they are, if I am right, simply descriptive statements that enumerate various empirical consequences of the theoretical proposals, which could be rephrased in a variety of ways.

One reason for keeping the generalizations distinct, though, is in comparing the cases of comparative suppletion to other alternations in grammar. As we examine different feature structures, parallels to the CSG and CSG2 are predicted to emerge, though not always in tandem. In this section, I examine one such extension, drawing on Wiese's (2004, 2005) analysis of ablaut in German verbs.<sup>14</sup>

In German, the strong verbs are characterized by vowel alternations in their principal parts, i.e., the present, preterite, and perfect participle stems (cf. English *sing-sang-sung*). These vowel alternations (ablaut) are largely unpredictable and must therefore be listed in one way or another. In the framework adopted here, such alternations are treated as readjustment rules (see above), either lexically restricted as a part of the context of the rule, or equivalently, restricted via diacritic marking of the root.<sup>15</sup> All told, Wiese notes that there are some 40 distinct patterns attested (Wiese 2005, 2). Some verbs show a three-way distinction, with a different vowel in each principal part, while others show some degree of syncretism. Strikingly, the attested patterns of syncretism may be summarized as in (207), where identity refers to identity of the stem (vowel).

- (207) a. Distinct for all three principal parts.  
b. Past and past participle identical, present distinct.  
c. Present and past participle identical, simple past distinct.  
d. unattested: present and past identical, participle distinct.

German examples illustrating the attested patterns are given in (208); forms are listed in the conventional order:

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<sup>14</sup>I thank Klaus Abels, Gereon Müller, and Curt Rice for drawing my attention to this general domain and Gereon Müller for making me aware of Wiese's work which this section reports on.

<sup>15</sup>Umlaut in the 2nd and 3rd person singular of the present, and in the subjunctive past, are predictable from the principal parts.

(208)		PRESENT 1SG	PRETERITE 3SG	PERFECT PARTICIPLE
	a.	‘speak’ sprech-e	sprach-Ø	ge-sproch-en
	b.	‘water’ gieß-e	goß-Ø	ge-goss-en
	c.	‘give’ geb-e	gab-Ø	ge-geb-en

The examples in (209) show it may be possible to make the same point for English, with a pair given for each pattern showing that the distribution is independent of whether the participle is marked with an additional suffix or not.<sup>16</sup>

(209)		PRESENT	PAST	PAST PARTICIPLE
	a.	sing	sang	sung
		ride	rode	ridd-en
	b.	shine	shone	shone
		tear	tore	tor-n
	c.	come	came	come
		give	gave	give-n

Wiese’s solution to the puzzle of why one of the possible syncretisms is unattested (namely (207d)) follows the same logic as I have proposed for the CSG, and thus stands as an important precedent for that logic. Specifically, Wiese proposes that there is a markedness hierarchy characterizing the principal parts, namely that in (210a) (Wiese 2005, 29), and crucially, that the features stand in a containment relation, as shown in (210b). Present is treated here as a default, thus with no defining features, while the features characterizing (the suffix node of) the participle are contained in those for the more marked preterite. (The choice of labels for the features is not relevant for the point made here, and can undoubtedly be improved upon; what is central here is the containment relationship. I also set aside the *ge-* prefix, characteristic of participles. As a place holder for a fuller analysis, I assume that the German participle has further structure as in: [ *ge-* [ [ *sproch* ] -en ] ], but that the features of present concern are in the lower, i.e., suffixal portion of this structure. If the syntax (and/or semantics) requires an additional participle-defining (or perfect) feature, then that feature is associated with the prefixal node *ge-*. Wurmbbrand (2010) argues on syntactic grounds (unrelated to present concerns) that *ge-* is associated with the syntactically relevant participle-characterizing feature. Part of her argument comes from a

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<sup>16</sup>A possible counter-example is *shear*, past *sheared*, participle *sheared* or *shorn*. Note also variant past *shore*, given in the *OED*.

cross-linguistic comparison of subtle differences in the internal order of verb clusters among Germanic dialects with and without (descriptively) circumfixal participles.)

- (210) a. present < participle < preterite  
 b. i. [ ] “present”  
 ii. [PAST] “(perfect) participle”  
 iii. [PAST, FINITE] “finite past tense”

Note that the order determined by the markedness hierarchy differs from the traditional textbook presentation of the principal parts (as in (208)) in that the participle occupies the middle position on the hierarchy, and in terms of features, is considered to be marked with respect to the present/infinitive stem, but unmarked among past forms, in contrast to the marked finite past form (the simple past).<sup>17</sup> But the markedness hierarchy in (210a) is consistent with the distributional evidence across Germanic; a venerable understanding of such markedness hierarchies holds that if a language lacks one category in the sequence, it will lack the most marked category (e.g., Jakobson 1941), and indeed, there are Germanic varieties (Yiddish, varieties of German including Austrian) that have a present and a perfect participle, but lack a simple preterite.

If this treatment of the features is supportable, then the logic of underspecification now applies for any rules that are conditioned by these features. In the absence of a designated form for any given category, the next most highly specified form is used. The possible patterns of syncretism, defined by (210b), are given in (211).

(211)		PRESENT	PARTICIPLE	PRETERITE	contexts	examples
	a.	A	A	A	(i)	(weak verb)
	b.	A	B	B	(i, ii)	<i>gießen</i>
	c.	A	B	C	(i, ii, iii)	<i>sprechen</i>
	d.	A	A	B	(i, ii)	<i>geben</i>
	e. *	A	B	A	(i,iii)	unattested

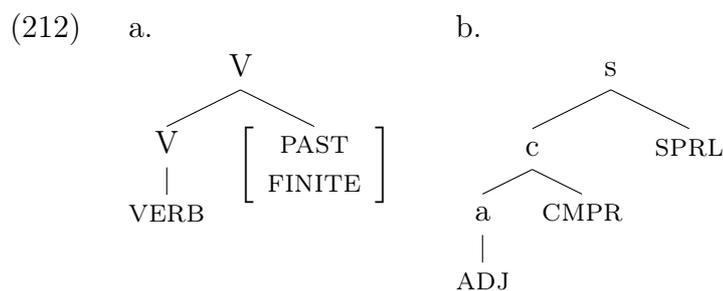
Just as with the CSG, the \*ABA pattern is unstatable. It is not possible to single out the middle member of the hierarchy (in this case, the participle),

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<sup>17</sup>Wiese notes precedents for this treatment, motivated by the patterns of stem syncretism discussed here, in Adelung (1782) and Johnston (1997).

to the exclusion of one of the other columns. To the extent that a particular ablaut form does in fact only surface in the participle (as in *gesprochen* in (208b)), this can only arise when the use of this form in the preterite is bled by a more highly specified form for that context. Despite the parallel with the CSG, there is also an important difference. In the case of comparative suppletion, neither the ABA nor the ABA pattern was attested, yet in the case of the German ablaut patterns, only one of these was excluded, the other attested.

This difference falls out from the theory presented here if the features do indeed stand in the containment relationship indicated in (210b). More specifically, if the features defining the preterite in (210b.iii) constitute a bundle of features, occupying a single morphosyntactic node, as diagrammed in (212a), then the adjacency issue — central to excluding the \*AAB pattern in suppletion — does not arise with the preterites. Compare the structure assumed for the superlative in (212b) — the SPRL head is non-adjacent to, and thus too far away from, the root to condition allomorphy, but the PAST and FINITE features are adjacent to the root.

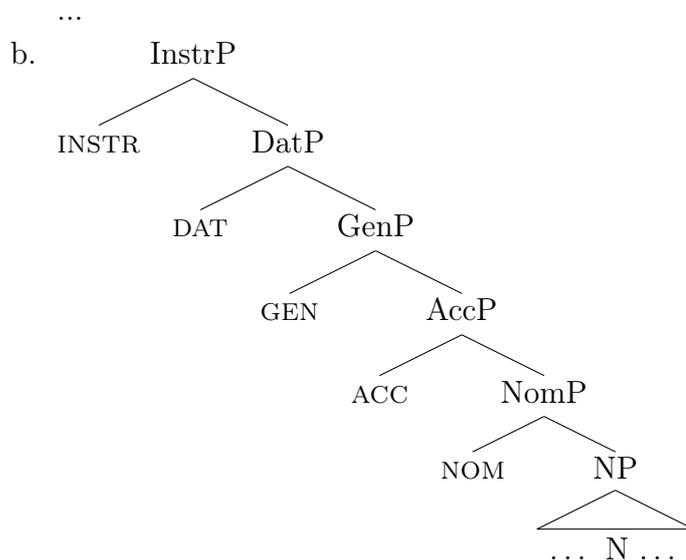


The Elsewhere logic applies when the context for one rule (R2) is a proper subset of the context of application of a more general competing rule (R1). When there are three relevant contexts, but only two rules, the Elsewhere logic prevents extension of the general rule (R1) to a context where R2 may also apply. This excludes ABA patterns, whether the rules are rules of exponence or of readjustment, and regardless of the internal arrangement of the features that make up the contexts in question. Exclusion of the AAB pattern requires the containment logic, but also a further assumption, namely, that of an adjacency condition restricting the range of configurations in which a head may serve as a contextual trigger for root allomorphy. With this in place, the theory predicts differences in the range of ABA and AAB patterns; not every context that excludes ABA will necessarily exclude AAB. The ev-

idence from Wiese’s account of German ablaut patterns appears to support this theoretical position.

Another context where it has been argued that ABA patterns are excluded, but AAB patterns are attested, is case syncretism. Caha (2009) proposes to represent case-markedness hierarchies such as (213a) (cf. Blake 2001) as feature-containment structures: thus the representation of “genitive” properly contains that of “accusative”, which in turn properly contains “nominative”, etc. Caha implements this as a richly decomposed tree (213b), with each node corresponding to one feature (see Chapter 7, below).

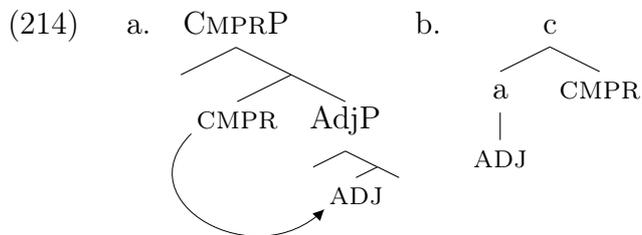
(213) a. Nominative < Accusative < Genitive < Dative < Instrumental



The interest of Caha’s proposals for the present study is that he builds on the containment logic developed in Chapter 2 to develop an account of (mostly) unattested ABA patterns in case syncretism. Thus, for example, Accusative and Dative cannot be syncretic to the exclusion of Genitive, given the structure in (213b). Like Wiese’s ablaut phenomena, the case patterns investigated by Caha differ from the comparative-superlative patterns studied here in admitting AAB patterns. While the rich tree structure may not be compatible with the current proposals (to the extent that cases other than nominative may trigger root allomorphy), Caha’s proposals may show the applicability of the general logic developed here over a wider domain. Like the ablaut examples, they also demonstrate the (partial) independence of (\*)ABA and (\*)AAB generalizations.

## 5.5 Merger, Rule Ordering, Diacritics and Acquisition

One final housekeeping comment is in order before we move on to the next empirical domain. Recall from the architectural assumptions at the beginning of this chapter that Merger is held to apply prior to vocabulary insertion. This assumption was critical to the discussion of locality in section 3.3.1 — Merger derives the local configuration in (214) which is the input to rules of exponence. As argued in section (3.3.1), without the prior application of Merger (or an equivalent operation such as Head Movement), the comparative morpheme could not condition allomorphy of the adjectival root.



However, this ordering appears to raise a paradox if, as is often assumed (at least for English), it is phonological properties of a root that determine whether or not that root undergoes Merger. One frequently encounters rough characterizations such as: mono-syllabic, and di-syllabic adjectives in *-y*, form synthetic comparatives (undergo Merger, in current terms), while polysyllabic roots do not.<sup>18</sup> Under the derivational architecture in (175), at the point where Merger applies, information about the phonological make-up of the root is not yet known.

The paradox is avoided if the conditioning of the application of Merger does not (despite appearances) make reference to surface phonological characteristics of roots. A review of the literature suggests that this is in fact correct. Specifically, I contend that the synchronic application of Merger is triggered by a diacritic feature on the abstract root (or stem). While there are some trends and sub-regularities, there are counter-examples to a phonological account in both directions. Monosyllabic adjectives such as *ill* and *apt* resist *-er* suffixation, and near minimal pairs exist in disyllabic adjectives

<sup>18</sup>I thank Andrew Nevins for raising this point, personal communication 2006. My thanks to Nilüfer Şener for introducing me to Graziano-King's work.

(*handsomer* versus \**irksomer*, Clahsen and Temple 2003). Particularly relevant is the experimental work of Graziano-King (1999) (see also Dalalakis (1994)).

There is an over-arching limitation, such that adjectives greater than two syllables strongly resist the comparative suffix (with well-known exceptions, including affixation of *-y* or *un-*, see below). However, among adjectives that are not excluded on these grounds, the results are far from neat. Thus, below the tri-syllabic threshold, Graziano-King shows that the major factor determining whether comparative formation is via suffixation or periphrasis is frequency, not phonological form. In one of her control tasks, a relative acceptability judgment with adult native speakers, high-frequency, monosyllabic adjectives like *old*, *long* took the suffixal, rather than periphrastic comparative in 99% of responses, while low-frequency items like *lax*, *gaunt* took the suffixal comparative in only 15% of responses (Graziano-King 1999, 55). Strikingly, for monosyllabic nonce words on a parallel test, the suffixal comparative was preferred over the periphrastic construction at exactly 50% (p.66). Similar results obtained across a range of experimental designs.

The conclusion I draw from the available evidence is that the distribution of analytic versus synthetic comparatives in English is grammatically regulated by a diacritic. Certain morphemes are specified as bearing a diacritic that triggers Merger, say  $^{+M}$ , while other morphemes do not. (In addition to roots, I assume that certain suffixes, such as the adjectival *-y* may also bear the diacritic.) The grammar is simple: at point (214a) in the derivation, if the abstract ADJ node is marked  $^{+M}$ , then Merger applies, and else Merger does not. The interesting variation lies then in the course of acquisition, namely, how a learner comes to know for a given root (or affix) whether it has the diacritic, or not (or perhaps, whether the diacritic is optional, as in *polite* – *politer* ~ *more polite*).

I presume that the acquisition of diacritic features involves a number of converging sources of evidence, available to the learner. Positive evidence in the input (for example, hearing and successfully parsing *older*, *longer*) leads the learner to posit the diacritic for high-frequency forms that do indeed bear the diacritic (including, for example, the suffix *-y*). Otherwise, statistical regularities in the input yield partial information about the distribution of the diacritic. In this manner, I assume, the acquirer can soon deduce that long adjectives (greater than three syllables) compare analytically, rather than synthetically, and can use this information in assigning the value  $^{-M}$  to the

roots of long adjectives.<sup>19</sup> In the case of experiments involving nonce adjectives, the task the speaker is faced with is to judge the chance that the new root “should” bear the diacritic. Evidently, given the phonological make-up of the items in Graziano-King’s (admittedly small) sample, the results came out at chance: speakers judged it to be roughly 50% likely that these words would bear the diacritic <sup>[+M]</sup>, based, by hypothesis, on their subconscious knowledge of statistical patterns in their lexicon. I would submit that a more extensive investigation would yield neighbourhood effects (perhaps involving a combination of phonological and semantic factors) of a familiar kind at play. It is also worth noting that the distribution of morphological versus periphrastic comparatives has been relatively unstable in the history of English (Kytö and Romaine 1997, González-Díaz 2006), again, the kind of behaviour that one might expect under a diacritic-learning scenario such as that proposed here.<sup>20</sup>

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<sup>19</sup>A relevant observation in this regards is the study of English children’s spontaneous production in Ohtaki (2010). Examining four children in the CHILDES corpus, Ohtaki found that the children never over-extend the use of *-er* to adjectives that do not take morphological comparatives in the adult grammar, but moreover, that they also do not over-use the periphrastic comparative, e.g., in contexts where the adult grammar requires a synthetic form (*\*more big*). In fact, the children in his study did not produce simple periphrastic comparatives at all, even where this is the only form admitted by the target (adult) grammar. Ohtaki suggests that this requires an interpretation whereby in spontaneous speech, as opposed to experimental settings, children do not guess and have no default, requiring evidence of one sort or another to establish the value of <sup>[±M]</sup> for any given adjective. A confounding factor, noted by Ohtaki, and earlier in Gathercole (1983), is that children’s use of morphological comparative forms, both regular (*tighter*) and suppletive (*better*) often appear to lack comparative semantics, being used as a variant of the corresponding positive, perhaps with some degree of intensification. If this is the proper interpretation of all the morphologically comparative forms in the corpus that Ohtaki examined (which is not certain), then these forms do not directly bear on the representation and acquisition of the <sup>[±M]</sup> diacritic.

<sup>20</sup>Graziano-King herself suggests that the experiments yield the conclusion that acquisition of the analytic-synthetic alternation in comparatives involves lexical listing, rather than rule-governed behaviour. My interpretation in the text is a hybrid — a rule, triggered by a lexically listed (i.e., diacritic) property. Under a literal interpretation of her proposal, where only listed morphological comparatives, learned by positive exposure, are grammatical, it seems that the expectation for novel forms should be 0% morphological comparatives, rather than 50%, i.e., because morphological comparatives of nonce adjectives do not occur in the input. The historical variation also seems to argue against a strict lexical-learning analysis, which would seem to imply that the set of adjectives undergoing morphological comparison could only decrease, and never increase, over time.

If diacritic features such as  $^{[+M]}$  are indeed part of the representation of the abstract roots (i.e., the ones I have been writing throughout in CAPS), then there is no ordering paradox. In terms of derivation, Merger does indeed precede vocabulary insertion, and the operation Merger cannot be, and is not, sensitive to the phonological make up of the root. On the other hand, phonological information, such as syllable count, can play a role in regulating the application of merger, but only indirectly, in the sense that the phonological patterning is one potential source of evidence guiding the learner in the acquisition of a diacritic feature.

At least superficially, the pattern with morphological comparatives appears to me to be reminiscent of (the acquisition and distribution of) other diacritics such as gender assignment, strong vs. weak verbs in Germanic, and the like. There are partial regularities that may generalize (e.g., by redundancy rule) but no overarching phonological regularity. For example, in Russian, certain word-forms provide no phonological cue as to gender. In one study looking at nonce words ending in unstressed [a], which are ambiguous between feminine and neuter gender, subjects chose feminine over neuter at roughly a 3:1 ratio, closely tracking the relative frequency of these two genders in the language (Tarasenkova 2010). The conclusion to be drawn, as with Graziano-King's 50% result for monosyllabic nonce adjectives, is that for gender, in Russian, when phonological or other cues (such as natural gender) are unavailable for particular items, speakers make an educated guess, with an appeal to the statistical probability for each gender (feminine:neuter = 3:1).

We may note in passing that the diacritic approach eliminates the ordering paradox discussed here, and also avoids the widely-discussed 'bracketing paradox' posed by forms such as *unhappier*, *unfriendlier*, *unrulier* (cf. Pesetsky 1985, among many others). The compositional meaning of these forms is clearly [ [ un-happy ] - er ] (i.e., 'more unhappy' rather than 'not happier'). The putative bracketing paradox arises on the assumption that there is a grammatical prohibition on attaching *-er* to trisyllabic stems, which would then be at odds with the semantically-motivated structure. But I have argued above that there is no grammatical prohibition of this sort. The root (or base) *happy* bears the diacritic  $^{[+M]}$ , and it is a general property of English prefixes that they are transparent for the percolation of diacritics (see, e.g., Lieber 1980, 1982). The *unhappier* examples are simply a special case of this broader phenomenon: the only grammatical bracketing is the semantically-motivated one [ [ un- [ happy ] ] $^{[+M]}$  -er ], in which *unhappy* inherits the

diacritic from *happy*.

There is clearly far more to be said on this topic, but it would take the discussion far further afield from the main thread than it already has already gone.<sup>21</sup> My narrow purpose in this section has been only to show how we might escape the ordering paradox that seems to arise if (English) morphological comparative formation is held to be implemented by morphological Merger, but sensitive to phonological information that is not available to the derivation until after Merger has (or has not) applied. Treating the alternation as directly regulated by a diacritic, and only indirectly sensitive to phonological sub-regularities in the course of acquisition, seems to be correct, and has the welcome benefit of side-stepping the apparent ordering paradox.

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<sup>21</sup>At various presentations of this material, audience members have suggested acquisition or artificial learning experiments, involving novel suppletive adjectives. One experiment might present the basic and comparative: *grock* – *santer*, eliciting a superlative. All else being equal, the theory developed throughout this book suggests learners would produce and/or prefer *santest* rather than *\*grockest*. A more subtle twist would present the basic and superlative, seeking the missing comparative: *grock* – – *santest*, with the predicted form being *santer*. Another experiment type might expose learners to an apparent ABA paradigm (*grock* – *santer* – *grockest* to see if it poses special problems in contrast to ABB or ABC paradigms. I remain somewhat skeptical of the utility of this latter experiment type, as the result would have to be extremely subtle. As noted in chapter 2, given the possibility of ABC patterns, UG must allow direct learning of three distinct roots in the three grades, and thus a putative ABA pattern in the input could, as a worst case, be analyzed as an ABC pattern with accidental homophony of the A and C allomorphs (see also remarks on apparent ABA patterns in section 4). Another source of an apparent ABA distribution in the input could be the conflation of two distinct, nearly synonymous paradigms (either an AAA and an ABB pattern, or two distinct regular patterns), with different statistical preferences in the different grades (see the remarks on English *small*, *little* at example (143)). An additional concern with artificial learning in this context is the possibility of explicit rules for individual lexical items (or classes thereof) overriding grammatical rules, allowing for the learning and use of unnatural patterns. Thus one can learn to write *the data are* in English, despite the overwhelming grammatical basis for treating *data* as synchronically a mass noun, necessitating singular agreement. Thus even in the extremely conservative *OED*, which treats the mass nouns use as ‘erroneous’, definitions of sub-entires show the mass noun use: **data structure...the way data is organized...**



## Chapter 6

# Getting *better*: Comparison and deadjectival verbs

### 6.1 Introduction

In the previous chapters, I have discussed in detail the Comparative Superlative Generalization in (33):

- (33) The Comparative-Superlative Generalization (CSG):  
If the comparative degree of an adjective is suppletive, then the superlative is also suppletive (i.e., with respect to the positive).

This generalization holds that, for a given suppletive alternation between positive (A) and comparative (B) roots, the corresponding (morphological) superlative will either inherit the root of the comparative (ABB), or involve a third root (ABC), but will in no case be built on the positive root (\*ABA). Some examples of the licit patterns are give here:

(215)	POS	CMPR	SPRL	
a. English:	<b>good</b>	<b>bett-er</b>	<b>be-st</b>	
b. English:	<b>bad</b>	<b>worse</b>	<b>wor-st</b>	
c. Czech :	<b>špatn-ý</b>	<b>hor-ší</b>	<b>nej-hor-ší</b>	‘bad’
d. Estonian:	<b>hea</b>	<b>pare-m</b>	<b>par-im</b>	‘good’
e. Latin:	<b>bon-us</b>	<b>mel-ior</b>	<b>opt-imus</b>	‘good’
f. Welsh:	<b>da</b>	<b>gwell</b>	<b>gor-au</b>	‘good’

In this chapter, we turn to an analogous generalization in the realm of deadjectival, change-of-state verbs, a subset of the verbs known as ‘degree

achievements’ in the relevant literature. These are verbs which are to a first (but possibly misleading) approximation, paraphrasable as ‘to become (more) A’ or ‘to make something (more) A’, for some adjective A. Some non-suppletive examples are given in (216):

(216)		ADJECTIVE	VERB	
	a. English:	<b>short</b>	<b>short-en</b>	
	b. English:	<b>cool</b>	<b>cool</b>	
	c. German:	<b>dick</b>	(ver)- <b>dick-en</b>	‘thick-thicken’
	d. Russian:	<b>dlinn-yj</b>	u- <b>dlin-jat</b> ’	‘long-lengthen’
	e. Finnish:	<b>suuri</b>	<b>suure-ntaa</b>	‘large-enlarge’

An influential analysis of these verbs originating in Dowty (1979) holds that such verbs are derived from adjectives by means of a (possibly covert) sentential operator, BECOME, as in (217a). For transitive senses, Dowty proposes a further operator CAUSE as in (217b). In much of what follows, I will abstract away from the distinction between inchoatives and causatives, using the symbol  $V_{\Delta}$  as a shorthand for the deadjectival verbalizing operator(s).<sup>1</sup>

(217)	a. [ BECOME [ $x$ COOL ] ]
	b. [ CAUSE [ BECOME [ $x$ COOL ] ] ]

When we turn to adjectives that form suppletive comparatives, we find with surprising regularity that the verb is formed from the comparative root allomorph and not from the positive root, as illustrated in (218).

(218)		POS	CMPR	VERB	
	a. English:	<b>good</b>	<b>bett-er</b>	(to) <b>bett-er</b>	
	b. English:	<b>bad</b>	<b>worse</b>	(to) <b>wors-en</b>	
	c. German :	<b>gut</b>	<b>bess-er</b>	ver- <b>bess-er-n</b>	‘good’
	d. Russian:	<b>plox-oj</b>	<b>xuž-e</b>	u- <b>xud-š-at</b> ’	‘bad’
	e. Finnish:	<b>hyvä</b>	<b>pare-mpi</b>	<b>para-ntaa</b>	‘good’
	f. Georgian:	<b>cud-i</b>	u- <b>ar-es-i</b>	a-u- <b>ar-es-eb</b> s	‘bad’
	g. (Late) Latin:	<b>bon-us</b>	<b>mel-ior</b>	<b>mel-iōr-o</b>	‘good’

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<sup>1</sup>Among other issues, I thus abstract away from the derivation of morphological anticausatives, in which the intransitive, inchoative verb appears to be derived from the causative as opposed to the other way around; see Koontz-Garboden (2009) for recent discussion.

What is striking here is not (just) the rather obvious point that words like *worsen* contain the comparative form. Rather, what makes this parallel to the superlative cases is that patterns with the positive root are often impossible: English: *\*to bad(den)*, German: *\*ver-gut-en*, Russian *\*u-plox-at'* etc. (apparent counter-examples to this claim exist, and will be discussed below). With appropriate caveats, the following appears to be a contender for a valid generalization, parallel to (33):

(219) The Comparative-Change of State Generalization (CΔG):

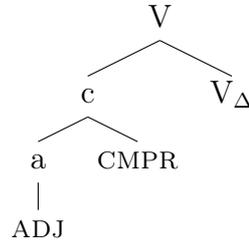
If the comparative degree of an adjective is suppletive, then the corresponding change-of-state verb is also suppletive (i.e., with respect to the positive adjective).

The generalization in (219) admits of attested patterns such as *bad – worse – (to) worsen* and excludes patterns such as *\*bad – worse – (to) bad-den* and analogously for other languages. In light of (217), the CΔG is surprising, if true. If [ BECOME [ COOL ] ] is a possible verb, then why should [ BECOME [ BAD ] ] be excluded, in favour of [ BECOME [ WORSE ] ]? Since the pattern is formally isomorphic to the CSG, I suggest here that the logic developed in chapter 2 should apply in this case as well. Just as the representation of superlatives must always contain that of the comparative, so too must the representation of deadjectival change-of-state verbs always contain the comparative, even where that relation is not transparent in the overt morphology. In place of (217), then, we have (220a) and not (220b):

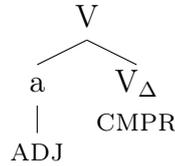
- (220) a. [ [ [ ADJ ] CMPR ] V<sub>Δ</sub> ]  
 b. \* [ [ ADJ ] V<sub>Δ</sub> ]

Alternatively, the structure may indeed resemble (220b), but the meaning of the operator is not Dowty's BECOME but rather a representation in which V<sub>Δ</sub> node is internally complex, crucially containing the comparative (cf. Hay et al.'s 1999 INCREASE operator, of the differential measure function **m**<sub>Δ</sub> of Kennedy and Levin 2008; see the end of this chapter for further discussion), as in (221b). Recall from above that in addition to strict nesting, as in (221a) (= (220a), two other structures that exclude ABA patterns (by virtue of triggering elsewhere rule application) were branching structures (section 3.2.2) and feature bundles.

(221) a.



b.



If a comparative-containing structure is posited for all cases, then the account of the CΔG parallels that of the CSG developed above. In that account, a key assumption was that root suppletion is to be treated as contextual allomorphy, via rules of exponence whose interaction is governed by the Elsewhere Principle. The vocabulary item (exponents) competing to realize the abstract root BAD are given in (222). The Elsewhere logic ensures that the comparative allomorph wins out to express the root whenever it can be inserted. The hypothesis that the superlative contains the comparative ensures that the superlative is *worst* rather than *\*baddest*, and the same reasoning yields *(to) worsen* rather than *\*(to) badden*, given (220a).<sup>2</sup> (The lack of an overt exponent of the comparative in verbs like *(to) cool* and *(to) shorten* can be modeled by a straightforward extension of the domain of the zero allomorph of the comparative in (42).)

- (222) a. BAD → worse /      ] CMPR  
 b. BAD → bad

While the proposal in (220a)/(221a) derives the CΔG, it stands directly at odds with Dowty's analysis, and those that have built on it (see Abusch 1986, Rothstein 2004 and Abusch 2005). One of the goals of this chapter is to show that the evidence for Dowty's analysis (essentially (220b) is not compelling, as against the alternative in (220a), and that there are existing semantic proposals we can draw on that explain the same range of facts, starting with a structure similar to (220a), especially Hay et al. (1999), Kennedy and Levin (2008) and Winter (2006). In the final section of the chapter, I return to the

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<sup>2</sup>A structure like (221b) would provide the same account of why (222) yields *(to) worsen* rather than *\*(to) badden* in English. It is less obvious that it would generate the right forms where the verb embeds an overt comparative morpheme (as in *to better*, and examples in (226) below). For the bulk of this chapter, I will set aside (221b), returning to it occasionally, as the discussion warrants.

empirical basis for the CΔG, investigating a range of *prima facie* counterexamples. I show that careful investigation reveals many of them to be in point of fact consistent with the generalization, though a small residue of troubling cases remains.

## 6.2 Preliminary remarks

Before delving into the meat of the chapter, though, a few preliminary remarks are in order regarding some differences between the CΔG and the CSG.

First, I argued at length above that the Containment Hypothesis for the superlatives applied to periphrastic as well as morphological superlatives. For reasons discussed, this is sometimes masked in the (surface) morphology of periphrastic superlatives, as, for example in Tatar and other languages discussed in section 3.4. Nevertheless, positing that the containment hypothesis holds of the syntactic relationship anchors the account of three possible universals: the CGS, the RSG, and the SSG. For change of state verbs, in contrast, it is far from clear that periphrastic constructions should always contain the comparative. First, periphrastic expressions (with *become*, *make*, *get*) systematically take both comparative and positive complements, whether suppletive or not:

- (223) a. The weather became worse.  
b. The weather became bad.
- (224) a. One pill makes you larger.  
b. One pill makes you large.

The meanings of these alternations are transparent, up to the vagueness inherent in gradable adjectives generally. Thus, (224a) clearly has comparative semantics, entailing that the pill will make you larger (i.e., than you are now), but with no commitment as to whether it will make you large in any absolute sense. On the other hand, (224b) has exactly that implication, namely that you will become large by whatever standard is contextually relevant. It lacks a comparative sense, and because it is a verb of *change* of state, it implies a change from *not large* to *large*. Even if it may be possible to derive the containment hypothesis for the superlative from the meaning of the superlative, and thus have it hold at all relevant levels of representation,

the periphrastic alternation in the verbs thus suggests that (220a) is more narrowly proscribed; the semantics alone does not preclude (220b), and if that is to be excluded, this must be a morphological fact.

A second issue worth remarking on briefly concerns the ABC pattern such as Latin *bonus – melior – optimus* ‘good – better – best’, and relatedly, the absence of AAB patterns: *\*good – gooder – best*’, which played a role in the discussion of the CSG. For the deadjectival verbs in (218), I have presented only ABB patterns, and one could well ask whether the CΔG patterns with or against the CSG as regards other possibilities.<sup>3</sup> For all practical purposes, it seems to be impossible to provide a clear answer to this question, for reasons having to do with both the (non)-productivity of category-changing morphology and near polysemy in lexical (verbal) roots. Consider, for example, the question marks in (225).

(225)	POS	CMPR	VERB
a.	<b>many</b>	<b>mo-re</b>	???
b.	<b>small</b>	<b>small-er</b>	???
c.	<b>tall</b>	<b>tall-er</b>	???

What are the deadjectival change-of-state verb corresponding to *many – more* and *small*? There are no verbs in (standard) English built on these roots (*\*(to) (en-)more*, *\*(to) (en-)many*, *\*(to) small(-en)*), thus if there is anything in the final column of (225), these must be suppletive. By meaning alone, perhaps *(to) increase* or *(to) multiply* might fit the bill for (225a), yielding an ABC pattern (but see section 6.4.5 for reasons to doubt that *multiply* belongs here). And perhaps something like *(to) shrink*, *(to) reduce*, *(to) diminish*, *(to) lessen* belongs in (225b), with *(to) grow* in (225c) for AAB patterns. Or not — it is rather doubtful that these should be considered to constitute suppletive forms, standing in a paradigmatic relation with the adjectival roots. Far more plausible, it seems to me, is that these are simply unrelated verbs that are close in meaning that can be pressed into service to fill a gap.<sup>4</sup> In any event, with no clear way to establish that there is

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<sup>3</sup>Deciding the issue could be relevant for evaluating the viability of (221b); compare the discussion of bundling and allomorphy in section 5.4.

<sup>4</sup>Deadjectival derivation of change of state verbs is quite unproductive, for ill-understood reasons, although there are sub-regularities, such as the near absence of inchoative and causative derivatives from human propensity adjectives (see Dixon 1982, 21-24). Note in this regard the recency (and humorous overtones) of the coinage *embiggen* filling a prior gap.

suppletion here, as opposed to a gappy area of lexical derivation, I leave the possibility of ABC and AAB patterns aside and focus on the contrast between attested ABB and (largely) unattested \*ABA patterns.

Note, relatedly, that positing the nested structure in (220a) suggests the expectation of an analogue to the SSG: deadjectival degree achievements containing an adjectival root may only be possible for those roots identified as combinable with a morphological comparative in the first place (see section 3.4).<sup>5</sup> Interestingly, this appears to be correct, at least for contemporary English *-en* suffixation (*shorten*) and zero derivation (*to cool*). All the deadjectival change of state verbs from gradable adjectives listed in (Levin 1993, 245) embed adjectives that are compatible with *-er* suffixation for comparatives. While this seems to provide *prima facie* support for postulating an analogue to the Containment Hypothesis for deadjectival degree achievements, there are other means of forming deadjectival verbs that appear to run against an extension of the SSG to the verbal domain. For example, verbs in *-ize*, *-ify* may be derived from adjectives that do not permit morphological comparatives: *modern* – \**modernner* – *modernize*, *solid* – \**solider* – *solidify*. Quite possibly of relevance here is the distinction between inner (root-attached, category defining) and outer (category-changing) affixation (Marantz 1997, 2007), to which I return below.

A third remark of note concerns the transparency of embedding. In chapter 3, I noted that systematic embedding of the comparative morphology (affix) in the superlative is widely attested cross-linguistically, even though it is synchronically invisible in languages like German and English. When we turn to the verbal domain, here too we find the comparative affix contained inside the verb form in a number of examples, as in the majority of the suppletive roots in (218) and also examples without suppletion in (226):

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For some adjectives, the change-of-state verb with the expected meaning is apparently derived morphologically from (or via) a noun: *old* – *to age*; *long* – *to lengthen*. In some cases, such as *lengthen*, the denominal derivation is used where a deadjectival derivation in *-en* is unavailable for phonological reasons (Jespersen 1909-1949).

If one sees this derivational area as abstractly productive, rather than gappy, with suppletive relationships populating lists such as (225) (see Apresjan (1992) for this view regarding analogous Russian examples) then it must be a domain of uncommonly rich suppletive relationships.

<sup>5</sup>The issues in this paragraph were raised by Edwin Williams and Mark Baker at presentations of this material.

(226)		POS	CMPR	VERB	
	a. English:	<b>low</b>	<b>low-er</b>	(to) <b>low-er</b>	
	b. German:	<b>schön</b>	<b>schön-er</b>	ver- <b>schön-er-n</b>	‘beautiful’
	c. German:	<b>groß</b>	<b>größ-er</b>	ver- <b>größ-er-n</b>	‘big’
	d. Late Latin:	<b>cert-us</b>	<b>cert-ior</b>	<b>cert-iōr-o</b>	‘certain’

Yet the evidence for transparent nesting is weaker for the verbs than it is for the superlatives. No language (so far as I know) shows systematically nested morphology in the verbs, the way many languages do in the superlatives. In German, for example, while some verbs follow the pattern in (226), others do not (see (216)). Moreover, while the comparative morphemes are frequently identifiable in the superlative examples (218), examples like (226) are relatively uncommon outside of suppletion. German has a number of such verbs, but English *(to) lower* is the only verb derived transparently from a non-suppletive comparative adjective, and the same may be true of Late Latin *certiōro*, to judge by a search of Lewis and Short (1879). I will for the most part abstract away from this difference in the frequency of transparent nesting between superlatives and verbs in this discussion.

I note finally that the discussion in this chapter, and the generalization presented here, are necessarily more tentative than the preceding chapters. One significant practical limitation is that the topic of deadjectival verbs is far less systematically covered in the descriptive grammars, and thus the empirical domain over which this can readily be tested is more limited. I contend nevertheless that the patterns described here are sufficiently robust as to encourage further exploration of the CΔG as a candidate linguistic universal.

### 6.3 Deadjectival Degree Achievements: Doubting Dowty

Dowty (1979) famously discussed de-adjectival verbs of change-of-state, noting that they show apparently ambiguous behaviour with regards to aspect (telicity) diagnostics. Thus, a verb like *(to) cool* may appear in both telic (227a) and atelic (227b) frames, as diagnosed (roughly) by the presence of time frame (*in an hour*) and durative (*for an hour*) adverbials, respectively:<sup>6</sup>

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<sup>6</sup>There are numerous complexities in the extremely large literature on this topic. See Rothstein (2004) for a relatively recent treatment with review of the literature.

- (227) a. The soup cooled in an hour.  
 b. The soup cooled for an hour.

This behaviour is puzzling, to the extent that telicity and atelicity should be mutually exclusive, and thus a given predicate should behave one way or the other. Compare, in particular, the behaviour of periphrastic expressions corresponding to (227), in (228). For these, standard telicity diagnostics yield generally unambiguous results:<sup>7</sup>

- (228) a. The soup got cool in an hour / \*for an hour.  
 b. The soup got cooler for an hour / \*in an hour.

As Dowty and others have noted, for the deadjectival degree achievements, there appears to be a *prima facie* correlation between telicity and whether or not the positive or comparative degree of the adjective is implied. Thus, (227a) is most naturally understood as synonymous with (228a) implying that the soup in fact became cool, whereas (227b) implies only that the soup became cooler (i.e., than it was), as (228b), though it need not have actually become cool. In both pairs, only the atelic versions can felicitously be continued by the phrase ... *but it never became cool*.

There is a large literature and ongoing debate on this topic. For some recent treatments, see Hay et al. (1999), Rothstein (2004), Abusch (2005), Winter (2006), Kennedy and Levin (2008), Kearns (2007), among others. My aim here is not to dive too deeply into this debate, but to consider only the one aspect of the debate that is of direct relevance to the CΔG. Specifically, the morphological fact (if it is a fact) that suppletive allomorphs are always used for a deadjectival verb, when such an allomorph is available, strongly suggests that the deadjectival verb always contains the comparative, even when the comparative morpheme is not overt. The question then is whether the facts discussed in the semantics literature threaten that conclusion. I will argue, of course, that they do not, relying in particular on the spirit (though not the details) of proposals in Hay et al. (1999), Kennedy and Levin (2008), Winter (2006).

The most potentially problematic view from the semantics literature, for our perspective, is the original proposal in Dowty (1979), extended in Abusch

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<sup>7</sup>The expression ‘for an hour’ is licit in (228a) on a different reading, namely, in which it modifies the extent not of the change event, but rather of the result state. This situation is implausible with cooling soup, but compare: *The weather got cool for an hour, and then it warmed up again*.

(1986, 2005), see also Rothstein (2004, 189). Dowty posits that the verb (*to*) *cool* never contains a comparative morpheme, and embeds the positive degree of the adjective in all readings (217), repeated here:

- (217) a. [ BECOME [ *x* COOL ] ]  
 b. [ CAUSE [ BECOME [ *x* COOL ] ] ]

Dowty proposes to derive the apparent comparative sense of the atelic expression in (227b) via the pragmatics, exploiting the context-dependent vagueness of the gradable predicate *cool*. In brief, his account runs as follows:

Start from the assumption that *x cooled* always means *x became cool*, in other words, that *x* underwent a change of state from *not cool* to *cool*. This explains the telic case. Now note that *cool*, as a gradable adjectives, does not correspond to any absolute (temperature) value, but what counts as *cool* varies depending on context. What counts as *cool* for a star is an order of magnitude hotter than what counts as a *cool* summer evening, while even in the same context, on a *cool* summer evening, a beer at the ambient temperature could hardly be described as a *cool* refreshment. Dowty proposes that the atelic use of (*to*) *cool* involves an iteration of (telic) changes, from not-cool to cool, with the contextual standard of cool-ness shifting along the way. As Dowty expresses it: “*The soup cooled for 10 minutes* [is true if] ... for each time *t* within an interval of 10 minutes duration, there is some resolution of the vagueness of the predicate *cool*, by which the soup is cool is true at *t* but not true at *t*<sub>-1</sub>” (Dowty 1979, 90). He offers the diagram in (229), where P is *cool* to visualize this:

- (229)    t<sub>-3</sub>   t<sub>-2</sub>   t<sub>-1</sub>   t  
           ¬ P    P  
                   ¬ P    P  
                           ¬ P    P

As the soup changes temperature, say, from 100° to 97°, the contextually-determined threshold for *cool* goes through a progression of changes. At the first instant, 99° is considered *cool* and thus the first degree of temperature loss satisfies the change from *not cool* to *cool*; next, the threshold is reset to 98°, and thus the next change, constitutes again a change from *not cool* to *cool*, and so on. An important assumption here is that while the actual temperature constituting the boundary between *cool* and *not cool* is context dependent, it is always the case that if some temperature D counts as *cool*,

than all lower temperatures must also count as *cool*. This approach ensures that *(to) cool* denotes a monotonic decrease in temperature. The internal semantics of change overrides any default contextual value for *cool* that may occur in the phrase *the soup cooled* in isolation.

In this proposal, the event described by the expression *x became cool* involves an iteration of sub-events, each of which is a itself a change from not-cool to cool, thus also describable as *x became cool*, and hence, the overall predicate counts as atelic under standard definitions (??).<sup>8</sup>

Dowty’s account stands squarely at odds with the suppletion facts. If the comparative-like readings are always derived from the positive form of the adjective, then there is no reason why the comparative allomorph of the adjective root should ever be permitted, let alone required, in the verb. Yet insofar as I can tell, neither Dowty, nor any other proponent of this general approach, has argued that the kind of calculus just discussed is the only means for deriving the atelic meaning. Indeed, Dowty himself commented that the account in (229) “avoids having to derive *The soup cooled* from the morphologically unmotivated BECOME [ *The soup is cooler*] rather than simply BECOME [the soup is cool]” (Dowty 1979, 90). This suggests that, aside from the morphology, there was no compelling reason from the semantics to take the non-comparative representation as basic in all cases.

Conceivably, then, one could imagine a theory that countenanced two distinct derivations for deadjectival degree achievements, one with and one without the comparative, permitting (230b) alongside (230a).

- (230) a. [ [ ADJ ] V<sub>Δ</sub> ]  
 b. [ [ [ ADJ ] CMPR ] V<sub>Δ</sub> ]

This view (which to my knowledge has not been entertained as such in the literature) would permit a committed proponent of a Dowtian account to maintain that account for (227), while admitting of the derivation in (230b) for verbs with the suppletive roots (such as *(to) worsen*, as well as for forms from other languages in (218)), as well as for the verbs (not typically considered in the semantic literature) with regular comparative morphology. In English, there is only one such form *(to) lower*), but there are more, for example, in German, such as *vergrößern* ‘to enlarge etc.’ < *größer* ‘larger’ < *groß* ‘large’ cf. (226).

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<sup>8</sup>The approach in Abusch (1986) differs in important details, but also embeds only the positive form of the adjective, appealing to contextual resolution of the vagueness in the adjective meaning to derive the comparative-like sense.

An approach positing two representations along these lines seems inadequate, however.

In the first place, if both representations in (230) are available, then we would expect suppletive adjectives to contribute two deadjectival verbs, distinguished by meaning and telicity. From *bad*, the derivation in *coolv* would yield a telic verb *(to) badden* alongside uniquely comparative, thus atelic, *to worsen*. But this is not the case. Quite generally (though there are exceptions), deadjectival degree achievements from positive roots are unattested, when a suppletive comparative root exists, regardless of telicity. The only verb (pace remarks in section 6.4.2) corresponding to English *bad* is *(to) worsen*, and it shows the same variable behaviour with respect to telicity as *(to) cool* does:

- (231) a. The weather worsened in an instant.  
b. The weather worsened for days.

The same point can be made with respect to verbs that embed regular comparative morphology. These, too, show the same ambivalent behaviour with respect to telicity diagnostics that is shown by verbs like *((to) cool*:

- (232) a. The new air conditioner lowered the temperature in an instant.  
b. We lowered the rope for hours (but never reached bottom).

Similarly, in German, time-span (*in 1 Jahr* ‘in 1 year’) and durative (*1 Jahr lang* ‘1 year long’ = ‘for 1 year’) adverbials correlate with the telicity of the the VP (see Musan 2002; note that as in English, there are numerous further complexities beyond the basic case, not considered here). Here too, to the extent I have investigated this, deadjectival degree achievements show ambivalent behaviour on telicity diagnostics, whether or not they morphologically contain the comparative. The pair in (233) illustrates this with a suppletive root, while those in (234)-(235) illustrate with regular, i.e., non-suppletive adjectives.<sup>9</sup>

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<sup>9</sup>The atelic examples imply that the salient endpoint is not reached, and beg a continuation (as in (232b)). There may be alternative, more natural, means of describing the relevant situations, but for present concerns, it suffices to establish that the presence of comparative morphology does not affect the ambiguous telicity of degree achievements. I thank Susi Wurmbrand, Martin Prinzhorn, and Wilfried Öller for discussion of these examples.

- (233) a. Die Situation hat sich 1 Jahr lang ver-bess-er-t  
the situation has REFL 1 year long V-bett-ER-PRTCP  
‘The situation improved for one year.’ (atelic)
- b. Die Situation hat sich in 1 Jahr (um ein Vielfaches)  
the situation has REFL in 1 year (by a severalfold)  
ver-bess-er-t  
V-bett-ER-PRTCP  
‘The situation improved (severalfold) in one year.’ (telic)
- (234) a. Das Geschwür hat sich 1 Jahr lang ver-größ-er-t  
the abscess has REFL 1 year long V-big-ER-PRTCP  
‘The abscess grew for one year.’ (atelic)
- b. Das Geschwür hat sich in 1 Jahr (um 1 cm) ver-größ-er-t  
the abscess has REFL in 1 year (by 1 cm) V-big-ER-PRTCP  
‘The abscess grew (1 cm) in a year.’ (telic)
- (235) a. Der Schneider hat die Hose eine Stunde lang  
the tailor has the trousers 1 hour long  
verlängert.  
V-long-CMPR-PTCP  
‘The tailor lengthened the trousers for one hour.’ (atelic)
- b. Der Schneider hat die Hose in einer Stunde  
the tailor has the trousers in 1 hour  
verlängert.  
V-long-CMPR-PTCP  
‘The tailor lengthened the trousers in one hour.’ (atelic)

What we can conclude from these examples is that variable telicity is not a function of the presence or absence of comparative morphology. Deadjectival verbs show ambiguous behaviour on telicity diagnostics, and in particular are compatible with telic frames, even when they transparently embed comparative morphology.

In other words, the representation in (230b) is compatible with both telic and atelic readings. The evidence from suppletion (the CΔG) is that this is the only representation available for suppleting adjectives, and that (230a) is unavailable for these adjectives. Why might that be? The strongest view would be that the representation in (230a) is always unavailable; that the relevant deadjectival verbs are always derived from comparatives, but that

outside of suppletive contexts, this relationship is often masked on the surface by a null comparative allomorph (42), an entity which was independently appealed to in the preceding chapters.

These considerations remove the major hurdle from Dowty's analysis for the general theoretical view put forward here. The fact that variable telicity arises in the presence of overt comparative morphology is sufficient to imply that there can be no compelling reason to uniformly derive degree achievements from positive adjectives directly. What remains to be shown is how the telic readings might be captured by a representation that always includes the comparative, even where that element is not overt.

Various authors, including Hay et al. (1999), Kennedy and Levin (2008), Winter (2006) have recently offered proposals that begin to answer this question. While these proposals do not specifically embed the comparative morpheme in the verb, the semantics that they offer comes close to doing so. Such proposals dovetail nicely with the considerations needed to derive the CΔG. By means of illustration, let us begin with the proposal in Hay et al. (1999). Simplifying considerably, the leading idea is as follows:

Start from the assumption that *x cooled* means *x became more cool / became cooler* (i.e., than it was before; the Hay et al. proposal combines 'become' and 'more' into a single operator INCREASE). The atelic cases are thus straightforward. All else being equal, *x became cooler* is expected to behave as an atelic expression, for the same reason that (228b) is atelic. In a standard way of thinking about this, *become cooler* has the 'sub-interval property' Bennett and Partee 1978, Dowty 1979 – if *become cooler* is true of an event *e*, then *become cooler* is also true of the sub-events that constitute *e*, up to a certain granularity. But if *x cooled* is necessarily atelic, how are the telic cases to be accommodated?

Hay et al. (1999) note that degree achievements may take an argument that denotes the extent of the change involved, as in (236). Laying aside iterative and other special contexts, a specific extent argument contributes a definite endpoint to the event, rendering it telic. Although not discussed, the extent argument also renders the explicitly comparative periphrastic expression in (228b) telic (see (236c)):

- (236) a. The soup cooled (by) two degrees (in an hour).  
b. The soup cooled to 20°C (in an hour).  
c. The soup got two degrees cooler (in an hour).

It is relatively clear why the extent argument should have this effect. As just noted, *becom[ing] cooler* has the sub-interval property – since temperature is a continuous scale, any event that is downward change in temperature is itself made up of sub-events that are also downward changes in temperature. But once the extent argument is added, this no longer holds, *becom[ing] 2° cooler* lacks the sub-interval property, as it is not made up of sub-events that are in turn instances of becoming 2° cooler. However it is to be formalized, the extent argument in these examples thus plays the role of a ‘measuring out’ expression (Tenny 1987, 1994) or ‘incremental theme’ (Dowty 1991), just as the direct object does in examples such as the oft-cited (237):

- (237) a. Mary drank a glass of beer (in a minute).  
 b. Mary drank beer (for an hour).

In the pair in (237), the (a) sentence is telic, because no sub-part of the event of drinking a glass of beer is an event of drinking a glass of beer. The quantized nature of the object *glass of beer* sets the endpoint for the event. Within a certain tolerance, the event is not completed until the last drop is drunk. By contrast, the mass noun *beer* provides no set endpoint, and an event of drinking beer consists of multiple proper sub-parts, each of which is itself an event of drinking beer.

Hay et al. (1999), and with somewhat different technology, Rothstein (2004) and Kennedy and Levin (2008), argue that otherwise atelic degree achievements can be rendered telic by the addition of an explicit end-point denoting expression. Hay et al. (1999) and Kennedy and Levin (2008) extend this approach to the apparent ambiguity in (227) and argue that a silent analogue of an extent argument may perform the same function even in the basic cases. For a sentence such as *The soup cooled*, context and world knowledge may make accessible an endpoint such as *to the point where it is (too) cool (to eat)*, yielding the apparently telic behaviour in (227a). To the extent that the salient endpoint coincides with the meaning of the positive adjective, the telic use appears to coincide with a positive paraphrase (228a), although a technically more accurate prose rendering of the semantics would be something like: *The soup has become cool-er to the extent where (we would now say) it is cool.*<sup>10</sup>

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<sup>10</sup>Winter (2006) makes a similar proposal, but relates change along a scale to movement along a path, thus drawing parallels to telicity – reaching an endpoint – with motion verbs;

Much work in this vein is devoted to showing the context-sensitivity of these constructions, and in particular, how different semantic classes of gradable adjectives vary in the degree to which they make a conventional endpoint accessible. To see this, consider another telicity diagnostic in English, using the contrast in (237) as a reference point. All else being equal, an imperfective (progressive) sentence with an atelic VP appears to imply the corresponding perfective, but the inference fails for a telic predicate:

- (238) a. Mary is drinking beer.  $\Rightarrow$  Mary has drunk beer.  
b. Mary is drinking a glass of beer.  $\nRightarrow$  Mary has drunk a glass of beer.

At first blush, deadjectival degree achievements show inconsistent behaviour on this test:

- (239) The workers are widening the road.  $\Rightarrow$  The workers have widened the road.

- (240) Kim is straightening the rod.  $\nRightarrow$  Kim is straightening the rod.

Yet at least in part this may reduce to the semantics of the adjective in question, and in particular the associated scale (see especially Rotstein and Winter (2004)). The adjective *straight* is closed, with a fixed upper bound beyond which it is impossible to be straighter. Hay et al. (1999) contend that closed maximum of the scale (allowing for context-sensitivity in the granularity of the measurement) provides a naturally salient endpoint and thus facilitates the telic reading. On the other hand, *wide* is an open-class adjective, and thus provides no intrinsic natural endpoint to the event, and leaving the atelic reading more salient. Clearly, there are many additional factors at play (see Rotstein and Winter (2004), Rothstein (2004), Winter (2006), Kearns (2007), Kennedy and Levin (2008)), but the general point remains that telic-like uses, correlating with the apparent positive paraphrases (*become adjective*) may well be accounted for by a complex interplay of factors, even if the semantic representation is indeed comparative in all instances.

At least to a first approximation, the discussion above jibes with the observation, raised at various presentations of this material, that aspectual elements (such as Slavic prefixes and Germanic particles) appear to interact with perceptions of a meaning distinction between ‘become X’ and ‘become

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see also Jackendoff 1996, 331.

more X' readings.<sup>11</sup> I suspect that, like English, the appearance of a meaning 'become X' (rather than X-er) is nevertheless secondary, a result of the interaction of a basically comparative meaning for the verb on the one hand, and the aspectual (in the sense of Aktionsart/telicity, not perfectivity) contribution of the prefix. If it is at all plausible to think of prefixes as able to contribute meanings like 'to the maximal extent' or 'a little bit / somewhat', then the source of the apparent meaning difference can be located in the boundedness of the degree/extent, without threatening the account given here. Indeed, something like this is independently needed, I would contend, for English particle constructions, for example in the difference between *to dry* and *to dry up/out*. The theoretical discussion above commits me to the view that *to dry* is [ BECOME [ DYR-ER ]], with the implication of a maximal, and thus bounded, extent being contributed by the particle *up/out*. An analysis of the complex system of Slavic aspectual prefixes is well beyond the scope of this paper, and thus I leave this as an open challenge, with the hope that further investigation will reveal nothing more sinister in the aspectual prefixes than what is independently needed to describe their properties outside of the realm of deadjectival change-of-state verbs.<sup>12</sup>

A final remark of relevance in this regards builds on an observation by Klaus Abels (personal communication, 2006). Abels noted that the change of state verb like *to cool* on standard approaches should denote a transition from *not cool* to *cool*, but since *cool* denotes an intermediate range on the temperature scale, there should be two directions in which such a change could occur. If we agree for the sake of argument that 20°C is *cool*, for soup, then the proposition *The soup cooled* should be true either by virtue of undergoing a change from hot to cool, or by undergoing a change in the opposite

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<sup>11</sup>I thank Mirjam Fried for first raising this point for Czech.

<sup>12</sup>Note also in this regard the deadjectival verbs of Karo Batak as presented in Woolams (1996, 62), some of which are given in (i)-(ii). The glosses suggest a morphological distinction between 'make X' and 'make more X', but the textual discussion seems to make clear that the sense of 'more' here is one of intensification of the verb. The affixes *pe-* and *-ken* are both causative-forming affixes, and the combination of the two yields an intensification. A similar process happens with comparatives, which can be doubly marked (prefix *ter-* and suffix *-en* yielding an "intensive comparative degree 'even more (adjective)'" (p.55).

- |     |         |                      |                         |
|-----|---------|----------------------|-------------------------|
| i.  | ganjang | pe-ganjang           | pe-ganjang-ken          |
|     | high    | to put up high       | to put up even higher   |
| ii. | uli     | pe-huli              | pe-huli-ken             |
|     | good    | to make good, repair | to make better, improve |

direction, for example, by defrosting a block of frozen soup, and bringing it to 20°C. In both cases, the soup starts out in a state that cannot be felicitously described with *The soup is cool* and ends up in such a state. As Abels notes, *The soup cooled* is utterly impossible (unquestionably judged false) in the thawing context. A standard reply might appeal to the pragmatics of scales, holding that frozen soup is indeed *cool*, but that *The soup is cool* is judged inappropriate due to the availability of a stronger proposition, namely *The soup is cold*. However, this direction is undermined by the further observation that the periphrastic expression *The soup became (merely) cool* is in fact available (if somewhat awkward) in the thawing context. In other words, *The soup became cool* means exactly what it should – a transition from *not cool* to *cool*, with the contextually-sensitive nature of *cool* held constant. By contrast, *The soup cooled* cannot mean this, and patterns instead with the periphrastic expression that embeds the comparative, requiring the endpoint be *cooler* than the starting point of the event described.

In sum, the suppletive evidence suggests that the comparative morpheme is always embedded in the corresponding verbs. This assumption is needed to force the comparative root allomorph, whenever one is available. The facts from the behaviour of verbs that overtly embed comparatives, as in (231)-(234), clearly indicate that the semantics must be able to derive the relevant range of meanings from this structure, including absolute-like, telic meanings. The brief review of the relevant literature just presented shows that there are contenders in the available literature for what such a semantics might look like. This significantly dilutes the force of a possible objection based on the success of Dowty (1979) in describing the ambiguity; there is no compelling reason to believe that the comparative cannot be contained in the verbs (even where it is not there overtly).

## 6.4 To good, to badden, and to many

We now turn to the empirical side of things and the investigation of some apparent counter-examples to the CΔG. Note first that the CΔG is narrowly formulated to apply to change-of-state verbs derived from gradable adjectives. The claim, by parity of reasoning to the account of the CSG, is that there exists an abstract morpheme  $V_{\Delta}$ , and that this morpheme may only combine with comparative stems (see (230)). Other morphemes may exist which derive verbs from adjectives, which are not restricted, or even expected,

to embedding the comparative. Russian, for example, has deadjectival verbs which are ambiguous between stative and change-of-state readings, such as that in (241):<sup>13</sup>

(241) **bel-yj** ‘white’ → **bel-et** ‘(to) whiten’ or ‘(to) be white’

Another verb type that is not subject to the CΔG is what might be called ‘ascriptive’ verbs, with meanings such as *belittle* and *exaggerate*. Like the stative verbs, their meanings do not denote a change of state (such as coming to have a property). For example, in current usage at least, *to belittle someone* is not to cause them to become little, but rather to (attempt to) cause them to appear little, or to decry their stature. Verbs with ascriptive meanings are not expected to show suppletion, even when built on otherwise suppletive adjectival roots. Russian again provides a nice minimal pair in this regards. The adjective meaning  $\hat{O}$ small $\bar{O}$  shows suppletion in the comparative (242), and there are two corresponding deadjectival verbs, one from each of the roots. The verb with the basic change-of-state meaning is, as predicted by the CΔG, formed on the comparative root (242a). On the other hand, the verb from the positive root is an ascriptive, rather than a change-of-state verb (242b):

(242)	POSITIVE	COMPARATIVE	VERB	
a.	<b>mal-yj</b>	<b>men’-še</b>	u- <b>men’-š-at</b>	‘to shrink’
b.	<b>mal-yj</b>	<b>men’-še</b>	u- <b>mal-jat</b>	‘to belittle’

Yet other verbs have only a tenuous synchronic connection to the adjective, in semantic terms. Once again, Russian provides an example. The adjective meaning ‘good’ is suppletive in the comparative: *xoroš-ij* – *lučš-e*, and again there are verbs from each of the two roots. The verb from the comparative root *u-lučš-at* has the regular change-of-state semantics, i.e., ‘to improve’ (to make better). The verb from the positive root *xoroš-et* is also a change of state verb, but rather than meaning ‘to make/become good’ it means ‘to become prettier’, and is thus in terms of meaning related to a distinct adjectival root *krasiv-yj* ‘pretty, beautiful’. There is a historical connection between *xoroš-ij* and *xoroš-et*, but semantic drift, has pulled

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<sup>13</sup>The verb is ambiguous between a stative and a change-of-state sense. The semantics of the stative sense are more complex than simply ‘be white’, as illustrated by the notoriously difficult to translate poem ‘The Sail’ (Lermontov 1832), which begins: *Beleet parus odinokij // v tumane morja golubom*. ‘A lonely sail *gleams white* [?] in the (light) blue fog of the sea.’

apart their meanings, with root *xoroš* taking over the basic sense of ‘good’ expressed by *dobr-* in the other languages.

The root for ‘good’ in a range of languages appears to be particularly susceptible to semantic drift in deadjectival verb formation. For example, Old English, Basque and Russian have verbs built on a basic (non-comparative) root for ‘good’ which mean ‘to fertilize’ (presumably from ‘to make the land good for farming’), while Czech and Bulgarian have verbs from the ‘good’ root meaning ‘to conciliate’ (cf. the English fixed expression ‘to make good’). Some of these verbs have additional meanings, but with the exception of Old English, these verbs have a drastically limited range of meaning when compared to the basic adjectives. While there are thus some fairly clear cases where the relation between the verb and the adjective is diachronic and not synchronic, there remains a rather sizeable grey area. Thus English *(to) worsen* and especially *(to) better* do not have the full range of meanings available to the corresponding adjectives, yet seem (to me) nevertheless to be close enough in meaning to the adjectives to count as the corresponding change-of-state verbs, thus relevant to evaluating the CΔG. I acknowledge, though, that this opens up something of a slippery slope, and thus that the accuracy of the CΔG will depend on a more precise resolution of some of these considerations, something I leave to future research.

Verbs built on the root for ‘good’ illustrate a further point that is relevant here. In some languages, the root meaning ‘good’ has both adjectival and nominal senses and corresponding morphosyntax. In English (and Dutch and German), for example, there is a noun *good* meaning something like ‘property or possessions’ (*the goods will be delivered...’*). Verbs with the root *good* may, with appropriate semantics, be derived from this noun, rather than (directly) from the adjective root *good*. Thus we find Dutch *ver-goed-en* ‘compensate’ (i.e. ‘to pay back for something in money or goods’) seems to be derived from the noun *goed* ‘good(s)’ (and similarly, one sense of Old English *gódian* ‘(to) good’ reported in the *OED*). There is certainly no reason to expect comparative morphology (and thus no reason to expect comparative suppletion) in these denominal constructions.

With these points in mind, table 6.1 provides a listing of cases that satisfy the CΔG. As with the CSG data, I have counted cognate triples, listing for each triple only one example (and where there are multiple, related verbs, for example, with different derivational morphology, I have listed only one verb). There is of course overlap still, in particular where positive roots with a given meaning differ among related languages, but there is a shared comparative

and verb. Note that many of the examples listed participate in doublet patterns, existing alongside a regular AAA pattern from the same root. Note also that I have not attempted to distinguish the range of meanings associated with a given verb. Thus, English *(to) better* corresponds to only a very restricted range of the semantics of *make/get good/better*, with *improve* being the far more general term. This contrasts with German *verbessern* which has a much wider distribution than the English (partial) cognate.

Table 6.1: Deadjectival verbs from suppletive adjectives

GLOSS	ADJ	CMPR	VERB	LANGUAGE; COGNATES
good	good	<b>better</b>	<b>better</b>	English; oth. Germanic
good	dobry	<b>lepszy</b>	<b>polepszyć</b>	Polish; Czech
good	xoroš-ij	<b>lučše</b>	<b>ulučsat'</b>	Russian
good	dobar	<b>bolji</b>	<b>poboljšati</b>	Serbo-Croatian; Slovenian
good	{ dobryj } { harnyj }	<b>krashchyj</b>	<b>pokrashchyty</b>	Ukranian
good	bonus	<b>melior</b>	<b>meliorare</b>	Latin; Modern Romance
good	da	<b>gwell</b>	<b>gwella</b>	Welsh
good	agathós	<b>beltiōn</b>	<b>beltiōō</b>	Anc. Greek
good	agathós	<b>kreíssōn</b>	<b>kreissōō</b>	Anc. Greek
good	on	<b>hobe</b>	<b>hobetu</b>	Basque
good	hyvä	<b>parempi</b>	<b>para ntaa</b>	Finnish
good	k'argii	<b>umJobesi</b>	<b>aumJobesebs</b>	Georgian
bad	bad	<b>worse</b>	<b>worsen</b>	English
bad	{ dårlig } { ille } { ond } { vond }	<b>verre</b>	<b>forverre(s) (seg)</b>	Norwegian; oth. Scandinavi
bad	dålig	<b>sämre</b>	<b>försämra(s)</b>	Swedish
bad	šlext	<b>erger</b>	<b>varergern</b>	Yiddish
bad	{ špatný } { zlý }	<b>horší</b>	<b>zhoršít (se)</b>	Czech
bad	ploxoj	<b>xuže</b>	<b>uxudšat'</b>	Russian
bad	pohanyj	<b>hiršyj</b>	<b>pohiršyty</b>	Ukranian
bad	malus	<b>pējor</b>	<b>pejorare</b>	Latin; Modern Romance
bad	dolent	<b>pitjor</b>	<b>empitjorar</b>	Catalan
bad	cattivo	<b>peggiore</b>	<b>peggiore</b>	Italian

bad	drwg	<b>gwaeth</b>	<b>gwaethygu</b>	Welsh
bad	kakós	<b>cheiróteros</b>	<b>cheirotereýo</b>	Mod. Greek
bad	kak'os	<b>héssōn</b>	<b>héssáomai</b>	Anc. Greek
bad	cudi	<b>uaresi</b>	<b>auaresebs</b>	Georgian
big	velký	<b>větší</b>	<b>zvětšít</b>	Czech; Polish, Serbo-Croatian
big	velykyj	<b>bil'shyj</b>	<b>zbil'shyty</b>	Ukrainian
large, big	mawr	<b>mwy</b>	<b>mwyhau</b>	Welsh
much, many	viel	<b>mehr</b>	<b>vermehrēn</b>	German; oth. Germanic
many, much	asko	<b>gehiago</b>	<b>gehiagotu</b>	Basque
much	paljon	<b>enemmän</b>	<b>enetä</b>	Finnish
many	bevri	<b>met'i</b>	<b>amet'ebs</b>	Georgian
many	küp	<b>artıq</b>	<b>arttırıǵa</b>	Tatar
small	mali, malen	<b>manji</b>	<b>umanjiti</b>	Serbo-Croatian; oth. Slavic
small, few	{ lille, lidt små }	<b>mindre</b>	(for) <b>mindske(s)</b>	Danish; oth. Scandinavian
small, little	parvus; paulum	<b>minor</b>	<b>minorare</b>	Latin; Modern Romance
few	wenig	<b>minder</b>	<b>vermindere(n)</b>	Dutch
few, (a) little	{ few (a) little }	<b>less</b>	<b>lessen</b>	English
small	bach	<b>llai</b>	<b>lleihau</b>	Welsh <sup>14</sup>
small	mikrós	<b>meiōn</b>	<b>meiōō</b>	Anc. Greek
small	mikrós	<b>elássōn</b>	<b>elassóō</b>	Anc. Greek
little, few	olígos	<b>héssōn</b>	<b>héssáomai</b>	Anc. Greek
little, few	olígos	<b>meiōn</b>	<b>meiōō</b>	Anc. Greek
few	cot'a	<b>nak'lebi</b>	<b>-k'l-</b> <sup>15</sup>	Georgian
old	gammel	<b>æld-re</b>	(for) <b>ældes</b>	Danish; oth. Scandinavian
near	agos	<b>nes</b>	<b>nesu</b>	Welsh
strong	cryf	<b>trech</b>	<b>trechu</b>	Welsh

We may now move on to a consideration of some apparent challenges to the CΔG. These challenges take the form of verbs that appear to derive

<sup>14</sup>Possible cognate triples in other Celtic languages, such as Irish *beag, tearc – lu – lagh-daíonn* and Manx *beg, tiark – s'loo – leodhaghay*.

<sup>15</sup>The corresponding verb here is *-k'l-* 'to take away' which shares a root with the comparative, but in this case the derivation goes the other way — the comparative is a participial form of the verb (L. Nash, personal communication 2006).

from the positive allomorph of roots that supplete in the comparative. I aim to show here that a large number of apparent counter examples are in fact not problems for the CΔG, once other relevant considerations are taken into account. Even though accounts for all the apparent problems are not available, it is worth noting that verbs apparently built on a positive adjective are in a distinct minority, a surprising fact on a Downtian approach to deadjectival degree achievements, as noted above.

### 6.4.1 Ancient Greek *goods*

We may begin with a consideration of Ancient Greek, as it provides a relatively straightforward case.<sup>16</sup> The Ancient Greek adjective *agath-ós* ‘good’ is a rich example of suppletion, entering into a one:many relation with a variety of comparative. The following is a standard listing, from Seiler 1950, Chantraine 1967, repeated from (142):

(243)		POS	CMPR	SPRL	
	Anc. Greek:	agathós	ameínōn		‘good’
	(also):		beltíōn	béltistos	
	(also):		kreíttōn	krátistos	
	(also):		lóion	lōistos	
	(also):			phéristos	

Additional suppletive comparative forms in *-teros*, such as *bélteros*, *lōíteros*, *phérteros*, with corresponding superlatives in *-tatos*, are also attested. Verbal derivatives from the suppletive comparatives are well attested, as expected under the CΔG. However, verbs derived from the root *agath-* are also attested, with (among other senses) the meaning ‘make good’ (thus: *agath-ýnō*, *agath-óō* (Liddell and Scott 1996), in apparent violation of the CΔG.

On closer inspection, with careful attention to sources, the counter-example evaporates. The term ‘Ancient Greek’ spans a long history of the language and an assortment of varieties. The problematic verbs are first attested in the post-classical Koine Greek of the *Septuagint* (Old Testament), dating from about the 3rd century BCE. And in the same sources, a regular comparative *agathóteros* and superlative *agathótatos* appear as well (Liddell and Scott 1996). The appearance of a counter-example here is thus an artefact of the

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<sup>16</sup>I thank W. U. Dressler for raising the example, and M. Peters for help in finding the solution.

standard presentation, which omits the regular comparatives in tables such as (243), yet includes the offending verbs (they have separate entries in Liddell and Scott 1996). But in fact, there are two periods of Ancient Greek to consider, with no evidence of an ABA pattern at any one point in the history of Greek. Through the Classical period, the comparative and superlative were uniquely suppletive, and verbs were built only on the suppletive allomorphs, while in the post-classical Koine period, a regular (non-suppletive) comparative doublet arises, and with it, a regular deadjectival verb.

### 6.4.2 Baddening (up)

A somewhat similar case comes from English. The (standard) English paradigm for *bad* is suppletive, with comparative *worse*, and the corresponding verb is *(to) worsen*. Yet colloquially, at least, the verb *(to) badden (up)* occurs sporadically. A Google search yields a handful of examples such as the following (there are no occurrences in the COCA corpus).<sup>17</sup>

- (244) I'm trying to badden up my image, like that Sabrina the Teenage Witch is trying to do. (<http://www.melissajohanhart.net/sightings.shtml,attributedtoRayRomano,speakingtoRegisPhilbin,April2000>)
- (245) Or is it, as we suspect, part of a new programme to badden up the image of the perennial good guy? (<http://http://www.paulcarr.com/tft/people/001223.php>)

The context of these examples makes the meaning extremely clear. The sense of *bad* is a positive, or at least a prestige, characteristic, corresponding to senses IV.12 and 13 in the *OED*:<sup>18</sup>

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<sup>17</sup>It should all but go without saying that Google hits are of limited reliability, and will turn up examples from non-native speakers, errors of various kinds, intentionally humorous coinages (*New Study Finds IQ of American Journalists Baddening*), and the like. Nevertheless, the following examples seem perfectly plausible to my ear, and were accepted as colloquial, but grammatical, by other speakers of English I have informally queried.

<sup>18</sup>The example in (245) refers to an incident involving an actor known for playing 'good guys' trying to reinvent himself as a rap star. It continues: "After all, rap is a tough game and if the Hoff is to make it as the new Eminem, he is going to have to start playing the role of the mean motherfucker, which is nowhere near as easy as it sounds." This is precisely sense 13 in (246).

- (246) IV. (orig. U.S.) Formidable, good. 12. As a general term of approbation: good, excellent, impressive; esp. stylish or attractive.... 13. Originally in African-American usage. Of a person: (originally) dangerous or menacing to a degree which inspires awe or admiration; impressively tough, uncompromising, or combative; (in later use also) possessing other desirable attributes to an impressive degree; esp. formidably skilled.

And as noted in chapter 2, in exactly this sense, the adjective *bad* compares regularly, not suppletively: *bad* – *badder* – *baddest*. Examples from the OED are given here (repeated from (141)).

- (247) a. We stayed in our Beemer for a bit, givin them a chance to check out our **badder** alloy wheels, ...  
b. Sheep Eye’s here, and I’m the **baddest** sonofabitch that ever moved.

What we have, then, is distinct senses of *bad* correlated with distinct morphological patterning. The garden-variety *bad* compares suppletively (*worse*) and that suppletion is carried over to the verb *worsen*. The hip *bad* by contrast compares regularly (*badder*), and thus the verb corresponding to this sense takes the plain root *bad*, an ABB and an AAA pattern, distinguished by meaning. The examples in (244)-(245) turn out on inspection to be consistent with the CΔG.

### 6.4.3 Moral goodness and ambiguity in Serbian

Another set of examples in which distinct senses of a single root play a role is drawn from colloquial forms in some varieties of Serbian and Croatian.<sup>19</sup> The adjectives meaning ‘good’ and ‘bad’ compare suppletively, following the general pattern in Slavic, as in (248). As also shown, there are corresponding verbs, with the expected meanings (‘to improve, to worsen’) derived from the comparative root allomorphs. (The clitic *se*) is the mediopassive which marks the inchoative forms; I lay aside here questions of the distribution of transitive and intransitive alternants.)

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<sup>19</sup>This section relies heavily on observations by M. Marelj and especially M. Despić, whose assistance I acknowledge with gratitude.

(248)	POS	CMPR	VERB	
a.	<b>dobar</b>	<b>bol-ji</b>	po- <b>bolj</b> -š-ati (se)	‘good’
b.	<b>zao (zl-)</b>	<b>gor-i</b>	po- <b>gor</b> -š-ati (se)	‘bad’
c.	<b>loš</b>	<b>gor-i</b>	po- <b>gor</b> -š-ati (se)	‘bad’

So far, so good. But alongside the standard forms in (248), the forms *prodobriti (se)* and *prozlititi (se)* are acceptable to some speakers, and occur in various contexts.<sup>20</sup> Not all speakers accept the verbs based on the positive root, but those who do report differences in meaning.<sup>21</sup> Unlike English *badden*, the solution is not as simple as a doublet with a regularly comparing adjective. Speakers who accept *prodobriti se* nevertheless do not accept a comparative other than *bolji*.

Despić (2008), Despić and Sharvit (To appear) explore the issues and the meaning difference here in some detail. Despić’s findings are striking (the following examples are all from his work). As in many languages, including English, the adjective *dobar* ‘good’ has a variety of senses, including an intersective reading and a non-intersective reading. Thus (249) is ambiguous, and can either refer to a person who is ‘good’ i.e., skillful at being a thief (the non-intersective reading), or can refer to a person who is both ‘good’ in some absolute, typically moral, sense, and also a thief (for example, Robin Hood).

- (249) On je dobar lopov.  
 He is good thief  
 ‘He is a good thief.’

For speakers that permit *prodobriti se* alongside standard *poboljšati se*, this ambiguity appears to be resolved in the corresponding verbs. If a thief gets better, at being a thief, only the verb built on the comparative root is available (250a). If the sentence in (250b), with the verb from the positive root, is acceptable, then it means only that the thief became good in the moral sense.

- (250) a. Ovaj lopov se po-boljš-ao  
 This thief REFL PRF-better-TV.MSG

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<sup>20</sup>The former is given, for example, in xx

<sup>21</sup>Despić’s report of the meaning differences, from speakers representing a variety of areas, is presented below. M. Marelj, personal communication 2006xx, also reports that some speakers who accept *prodobriti (se)* understand it only in a facetious or humorous sense.

‘This thief got better (more adept).’

- b. Ovaj lopov se pro-dobr-io  
This thief REFL PRF-better-TV.MSG  
‘This thief became (morally) good.’

Of particular relevance here is the further observation that comparative morphology also disambiguates the senses of ‘good’. More specifically, the comparative *bolji*, whether attributive or predicative, lacks the moral reading available in the positive. The paradigm in (251) illustrates:

- (251) a. On je dobar fudbaler.  
He is good soccer.player  
‘He is a good soccer player.’ (ambiguous: moral or skillful)
- b. On je bolji fudbaler.  
He is better soccer.player  
‘He is a better soccer player.’
- c. On je dobar fudbaler, ali ovaj je jo? bolji.  
He is good soccer.player, but this is even better  
‘He is a good soccer player, but this (one) is even better.’ (un-ambiguous: more skillful)

Despić reports that parallel considerations apply to the special form *prozlititi (se)* ‘(to) become (morally) bad’, alongside expected and normal *pogoršati (se)* ‘(to) worsen’. Despić’s conclusion is that *dobar* ‘good’ is ambiguous, between an intersective, moral reading (‘x is a thief, and x is good’) and a non-intersective reading (‘x is good (at being a) thief’), but that only the latter is (for unclear reasons) subject to comparison. Moral goodness is evidently not a gradable property. As such, only the non-intersective reading gives rise to morphological comparatives, which, as expected, serve as the basis for the deadjectival verb. The verb *prodobrio se* is derived from a non-gradable adjective, and thus falls outside the scope of the CΔG.

#### 6.4.4 Russian: bad feelings

The Russian adjective *plox-oj* ‘bad’ is suppletive, with comparative *xuž-e < xud-*. The regular verb meaning ‘(to) worsen’ is from this comparative allomorph: *u-xud-šat*. Alongside this verb are, however, various verbs built on the positive root *plox-*. One of these verbs, *s-plox-ovat* ‘(to) make a blunder’,

falls semantically outside the range of verbs relevant to the CΔG, but a second verb, the colloquial *po-plox-et*’ seems more problematic.<sup>22</sup> This verb is used impersonally, as illustrated in (252b) corresponding to the impersonal construction in (252a). In this usage, the adverb compares suppletively: *mne xuže* ‘I feel worse’, so the considerations regarding previous apparent counter-examples do not apply.

- (252) a. mne plox-o  
 me.DAT bad-ADV  
 ‘I’m sick’ / ‘I don’t feel good.’  
 b. mne po-plox-el-o  
 me.DAT PREF-bad-PST-NEU  
 ‘I suddenly felt sick, felt worse.’

The Russian speakers I have discussed the example with consistently draw attention to a sense of ‘sudden onset’ in (252b). This may suggest a derivation of the apparently offending verb that follows an alternate route to verbhood, avoiding  $V_{\Delta}$  and the associated prediction about suppletion. Recall from the beginning of this section that Russian does have de-adjectival stative verbs (meaning ‘be X’ rather than ‘become X’). In addition, the complex system of aspectual prefixes includes inceptive prefixes, indicating the start of an event. While not the most frequent exponent of inceptive aspect, the prefix *po-* does have this use, as in *bežat*’ ‘(to) run’ → *po-bežat*’ ‘(to) start to run’. In theory, then, the morphology of Russian provides at least two routes to a meaning that is very close to ‘become ADJ’. The structure in (253a) is the one that has been the focus of this chapter, and involves  $V_{\Delta}$  and thus the comparative, deriving *u-xud-šat*’ with the comparative allomorph. The structure in (253b) is the combination of the inceptive *po-* with the (abstract) stative-forming morpheme  $V_{STATE}$ .

- (253) a. [ [ [ ADJ ] CMPR ]  $V_{\Delta}$  ]  
 b. [ INCEPT [ [ ADJ ]  $V_{STATE}$  ] ]

If this analysis can be sustained, it is somewhat of a two-edged sword. On the one hand, it avoids the otherwise problematic character of (252b),

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<sup>22</sup>Thanks to G. Corbett and A. Krasovitsky for the example; N. Radkevich notes *s-plox-et*’ for some speakers with the same meaning; I thank also O. Tarasenkova, N. Fitzgibbons and N. Kariaeva for discussion. M. Despić and others have noted that Serbian and Croatian have analogous forms, to which the analysis offered here should extend.

removing yet one more apparent counter-example. On the other, it points to a subtlety in the predictions of the CΔG — the prediction is about the results of a particular derivation, a derivation that may be circumvented if the morphological resources of the language allow it. The combination of inceptive and stative morphology yields a meaning (‘start to be X’) that is extremely difficult to tease apart from the meaning relevant to the CΔG (‘become X’). The existence of such an alternate derivation opens a back door in the analytical realm which, if not circumscribed, threatens to bleed the predictive force of the generalization. For Russian, we may at least point to the independent evidence for the constituent pieces of this alternative derivation, but the concern remains.

### 6.4.5 Multiplicity

Alternate routes to verb-hood may be at work in another set of challenges coming from expressions meaning ‘to multiply’. If (the translation equivalent of) this verb is taken to be the corresponding change-of-state to *many/much*, then there are many challenging examples in this domain. Some are given in (254), with the corresponding suppletive comparatives (see section 4.3 for many more examples of suppletive comparatives of ‘many/much’ terms):

(254)		POS	CMPR	VERB
	a. German	<b>viel</b>	<b>meh-r</b>	ver- <b>viel</b> -fach-en
	b. Hungarian	<b>sok</b>	<b>tö-bb</b>	<b>sok</b> -as-odik
	c. Hungarian	<b>sok</b>	<b>tö-bb</b>	<b>sok</b> -szorosít
	d. Finnish	<b>monet</b>	<b>usea</b> -mmat	<b>monin</b> -kertaistaa
	e. Russian	<b>mnogo</b>	<b>bol’š-e</b>	u- <b>množ</b> -at’(-sja)

It is not clear that ‘(to) multiply’ really stands in the right semantic relation to ‘many’ to consider these problematic. At a minimum, it appears that the element meaning ‘many’ in various languages shows some measure of an ambiguity between a quantificational element (subject to comparison) and a numeral-like entity (cardinal *many*). In some languages, it can also be used as a noun, with a meaning such as ‘a crowd’ or ‘a large amount’. The numeral-like usage of ‘many’ is illustrated by Hungarian *sok*, which may take morphology that is otherwise restricted to numerals, for example, ordinal-forming *-dik*, as in (255). With *sok* ‘many’, the ordinal corresponds roughly to casual English *umpteenth*.

- (255) a. öt = 5                    ötö-dik = 5th                    öt-szöröz =  $\hat{O}$ quintuple $\tilde{O}$   
 a. sok = ‘many’    soka-dik = ‘many-th’    sok-szorosít =  $\hat{O}$ multiply $\tilde{O}$

The verb-forming patterns in (254) follow the pattern for forming verbs meaning ‘to double, triple, quadruple, etc.’ from numerals. Since cardinal numerals do not denote gradable concepts, the morphology that derives these verbs must be of a form that does not require a comparative complement. The categorial ambiguity of many ‘many’-words thus provides an alternative route to verb-hood, bypassing the morphology (by hypothesis,  $V_{\Delta}$ ) that derives degree achievements from adjectival roots.

In addition, some examples, including the Hungarian and German examples in (254a-b) involve additional derivational morphology between the quantifier root and the verbalizer (or a hypothetical hidden comparative morpheme, selected by the verbalizer). Given the adjacency condition, the extra derivational morphology shields the root from the triggering context for suppletion. We see this effect, for example, in the English pair *good* – *better* versus *good-ly* – *good-li-er*, where the intervening derivational morphology blocks root suppletion in the latter. German *vervielfachen* in (254a) is derived, not from *viel* itself, but rather from the derived adjective *viel-fach* ‘multiple’ (cf. English *mani-fold*), with *-fach* predictably blocking suppletion. In a similar manner, Hungarian *sokasodik* appears to have a transparent derivation from *sok* in its nominal, rather than adjectival, guise, via the suffix *-as*, which forms adjectives from nouns, and then *-odik*, which forms verbs from adjectives. The derivation thus parallels: *ház* ‘house’ > *ház-as* ‘married’ > *ház-as-odik* ‘to marry’.

With these considerations in place, it is not clear that the meaning ‘to multiply’ is related in the right way to the gradable quantificational element ‘many’, which undergoes suppletion, to be subject to the CΔG. A closer meaning might be ‘to increase (in quantity)’. And indeed, German shows a contrast between the verb *ver-viel-fach-en* ‘(to) multiply’, in (254) on the one hand, and verbs meaning to increase in quantity on the other, including *mehr-en* and *ver-mehr-en*, both built, as expected, on the comparative allomorph of the quantificational root.

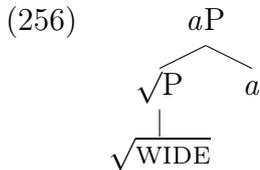
#### 6.4.6 Compounds and roots

It is worth noting that some of the forms in (254) involve compounds, rather than affixal structures. Thus in Hungarian, the verb *szoroz* on its own means

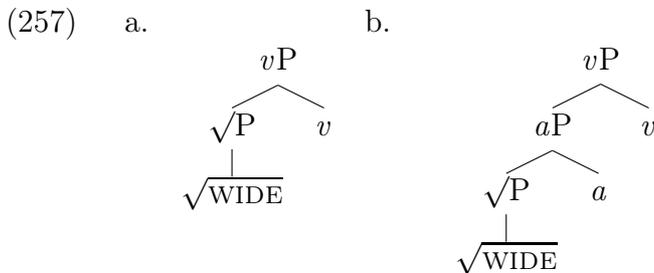
‘(to) multiply’; the forms in (255) appearing to be compounds of this verb with a numeral. In discussing Armenian superlatives above (section 3.4.1), I noted that compounds appear to involve a distinct internal structure. For present purposes, if that is the case, then the roots for *many* in compound forms like (254c) fall beyond the reach of the trigger for comparative suppletion.

This consideration appears to be relevant here as well. The Modern Romance languages have verbs such as Italian *bonificare*, French *bonifier* ‘improve’, apparently derived from the positive root *b(u)on-* ‘good’, alongside *migliorare*, *ameliorer* from the suppletive comparative root. The historical sources for both are clearly compatible with the generalizations as presented here: the latter verbs involve(d) morphological derivation from the adjective and transparently embed the comparative (as required the CΔG). On the other hand, the verbs containing *-ifi-* ultimately derive from periphrastic / compound constructions in Latin *bonu(m) ficare* ‘good make/do’ (A. Calabrese, personal communication). The theory of locality presented in Chapter 3 ensure that syntactic (periphrastic) complementation structures will not be suppletive (see 223). What remains to be shown is how the synchronic analysis of the Italian and French verbs relates to the Latin periphrastic construction. One (uninteresting, but not implausible) option is that the modern verbs are descended independently of the adjectival roots they (historically) contain. An alternative would be to posit a richer structure in the complement of *-ifi-*.

As noted in the previous subsection, the adjacency condition appealed to elsewhere requires that the trigger for comparative suppletion must be adjacent to the root, in order for that root to undergo suppletion. Now, throughout this work, I have not distinguished a root from its category. Much work in Distributed Morphology does draw this distinction however, and would represent a positive adjective, such as *wide*, in the syntax, as in (256), with a root (symbolized  $\surd$ ) dominated by a category-defining phrase (indicated by a small letter, here *a* for adjective; not to be confused with the mnemonic node-designators I have used in the morphological representations elsewhere in this book). See Pesetsky (1995), Marantz (1996, 2007), Harley and Noyer (1999), Embick (2010), among many others.



From this perspective, Marantz (1997, 2007) draws a distinction between ‘inner’ and ‘outer’ morphology. Inner morphology attaches to the root, or at least within the domain of the first category-defining head. Outer morphology attaches outside a category-defining root. For a given root that normally occurs as an adjective (i.e., in the syntactic configuration in (256), there are thus (at least) two distinct derivations that will yield a verb, as in (257):



Of these, only (257b) is truly category-changing, in the sense that it actually embeds one category-defining node inside another. In principle, either of these could be the abstract representation of a verb like *widen*. However, with the adjacency condition on suppletion (applying to the complex heads derived from (257) by Merger or head movement), a key distinction potentially emerges. The root in (257a) is close enough to the head *v* to be conditioned by it, while the root in (257b) is not. (This reasoning assumes that the comparative element is near or within the *v* node in (257); cf. (221)b)). If the *-ifi-* derivations involve outer morphology, as in (257b), consistent, perhaps, with their historical source as phrasal complementation structures, then the lack of suppletion in forms like *bonifier* follows from the locality conditions on suppletion already posited. This conclusion holds even if structural adjacency is replaced by the more complex combination of structural and linear locality conditions proposed in Embick (2010), in which (in effect) an outer category-denoting head may not condition allomorphy across an intervening category-denoting head.

As noted earlier in this chapter, the inner/outer distinction could provide an insight into the difference between two types of verbalizing morphology,

as regards a potential SSG-like generalization. Degree achievements derived from adjectives by means of zero-derivation (a null affix) or the *-en* suffix appear to inherit the lexical restrictions of morphological comparatives, and thus only form degree achievements from roots that take morphological comparatives. On the other hand, *-ify* and *-ity* derive change of state verbs from a wide range of stems, including adjectives that do not permit of morphological comparative formation (*modernize*, *solidify* versus *\*modernier*, *\*solider*). If these represent different abstract morphemes, it is plausible that an account of this difference could be found in terms of the differing types of meaning available to inner and outer morphology differing relations (both semantic and morphological) that inner and outer category-defining nodes may bear to a given root (see Marantz 2007 and especially Ramchand 2008 for relevant proposals).

Like the inceptive morphology discussed for Russian, then, the theory allows for multiple routes to the verbal structures, with the CΔG predicted to hold only of certain derivations. And also like the Russian inceptive derivations, recognizing this possibility makes the analytical task that much harder, in determining which derivation applies in any given case, in non-circular fashion. I have not investigated this for *bonifier* and leave this as a tentative and programmatic indication of a direction that seems to me to have merit in accounting for these forms.

### 6.4.7 Outstanding examples

To this point, we have considered a variety of prima facie counter-examples to the CΔG, and I have argued that, with varying degrees of confidence, these may be safely explained away. There remain, however, a few outstanding examples for which no obvious solution presents itself. For the record, I note these here.

First, while some uses of Old English *góðian*, and Middle English *goden*, (*to*) *good* (attested into the 17th Century) fall outside the realm of relevant meanings (as noted above), a residue of problematic uses remain. The *OED* gives examples supporting the meaning ‘to become better, improve’ and ‘to make good’. A 13th century example (for which no gloss is provided) juxtaposes *igodet* ‘goodened’ and *iwurset* ‘worsened’, strongly suggesting a meaning relevant to the current study. Note that Old English *góðian* forms a doublet, alongside *bétan* with the suppletive root as expected.

Another apparent counter-example is from Old Church Slavonic, in which

the adjective *velikŭ* ‘big’ undergoes suppletion in the comparative (with two distinct roots: *bol-* and *vęšt-*), but where the change-of-state verb is built on the positive root: *vŭz-veliĉ-iti*. It is perhaps worthy of note that in the modern Slavic languages, the situation has resolved itself to some degree. Thus in Russian, the basic adjective for ‘big’ has become *bol’s-ój* (comparative: *ból’s-e*) with *velik-ij* relegated to the narrowed meaning ‘great’. The verb *u-veliĉ-iva-t’* retains the general meaning ‘(to) increase, magnify’ but the replacement of the positive root means this is no longer an ABA pattern, but if anything, an AAB pattern (on which see above). On the other hand, Ukrainian retains the suppletive pattern from OCS (*velyk-yj* – *bil’s-yj* ‘big – bigger’) but has undergone changes in the verbal domain, with *voz-velyĉ-yty* taking on the specialized meaning of ‘to glorify’ and the general verb meaning to increase built on the comparative: *z-bil’s-yty*. Serbo-Croatian retains the suppletive adjectives, and a doublet in the verbs (with the problematic *u-veliĉ-ati* limited to the causative/transitive usage).<sup>23</sup>

Also in Slavic, Polish presents an apparently more serious challenge, as discussed by P. Jabłońska (personal communication, cf. Jabłońska 2007, 141). In Polish, transitive and anticausative deadjectival verbs conform to the CΔG, but simple inchoative verbs formed from adjectival roots with no derivational morphology seem to violate it. For example, corresponding to the suppletive pair *dobr-y* – *lepsz-y* ‘good – better’, one finds the verbs *u-lepsz-yć* ‘(to) make sth. better’ (with causative prefix *u-*) and anticausative *po-lepsz-yć się* ‘(to) get better’ but also an inchoative verb *dobrz-eć* ‘to get better’. This looks like a real counter-example, though note that there appears to be some systematicity here in that only the true inchoatives fail to embed the comparative stem.<sup>24</sup>

<sup>23</sup>Data and discussion reported in this paragraph from L. Veselinova, R. Feldstein, N. Kariaeva, M. Marelj, and Ž Bošković.

<sup>24</sup>M. Krämer (personal communication, 2006) observes that the inchoative versus anticausative contrast may have a reflex in German as well, where (among zero-derived verbs) inchoatives appear to be built directly on the root (without umlaut) but transitives and anti-causatives undergo umlaut if the comparative does:

- (1) i. *alt* – *älter* – *veralten* ‘old – older – to age’  
*arm* – *ärmer* – *verarmen* ‘poor – poorer – to become poor’
- ii. *hart* – *härter* – *sich verhärten* ‘hard – harder – to harden (intr.)’  
*jung* – *jünger* – *sich verjüngen* ‘young – younger – to become younger’

## 6.5 Summary: What's the Difference?

This chapter has explored the possibility that a generalization parallel to the CSG(1) exists in the domain of deadjectival verbs, stated as the C $\Delta$ G. I considered some of the theoretical ramifications of that conclusion. On the empirical side, this chapter has been the most tentative thus far — the C $\Delta$ G could be fairly described as surprisingly robust, with a great many consistent examples (see 6.1), and alternative accounts available for most apparent counter-examples. If the remaining counter-examples can be explained away, then the logic of an account presents itself by parity of reasoning to Chapter 2, implying a parallel Containment Hypothesis. Yet for the verbal domain, an appeal to semantic complexity seems a less obvious underpinning to this hypothesis than it might for the superlatives (see Chapter 261).

A somewhat more radical, though potentially problematic, possibility, is to build the comparative meaning into  $V_{\Delta}$  itself, in a way that allows — or rather requires — it to trigger comparative root suppletion. Hay et al. (1999) and Kennedy and Levin (2008) pursue approaches very much of this sort. Thus, Kennedy and Levin (2008) propose that (a component of) the meaning of the grammatical element that characterizes degree achievements (regardless of their derivation) is a measure-of-change function  $\mathbf{m}_{\Delta}$ . The function, applied to an individual  $x$  and an event  $e$ , measures the difference in which  $x$  changes in  $\mathbf{m}$ -ness over the course of  $e$ , where  $\mathbf{m}$  is some property, denoted by the adjective in the case of deadjectival degree achievements. Kennedy and Levin (2008) suggest that  $\mathbf{m}_{\Delta}$  is a special case of what they call in related work (see Kennedy and McNally (2005)) a differential measure function  $\mathbf{m}_{\downarrow}^{\uparrow}$ . The core of this proposal holds that a simple adjective denotes a function relating an individual to a (position on a) scale of measurement (for example, the height scale for the adjective *tall*), the comparative degree of an adjective denotes a function that measures the difference between an object's associated value on the scale and a second value, provided by the standard of comparison.<sup>25</sup> Seeing the measure of change as difference over time, the key meaning component of  $V_{\Delta}$  effectively incorporates a special case of the comparative meaning. Like the superlatives, the degree achieve-

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<sup>25</sup>For differential measure functions, including  $\mathbf{m}_{\Delta}$ , they stipulate that the function returns a positive value if the difference is positive, and zero otherwise; this applies both to comparatives, which are always of superiority, never of inferiority (see section 261) and to deadjectival themes, which likewise always denote a positive change.

ments are thus a proper subset of ‘comparative’ environments, but unlike the superlatives, this need not be encoded by a nested structure. Put differently, this direction would amount to positing the structure  $[[ \text{ADJ} ] V_{\Delta}]$ , but with the understanding that the  $\Delta$  component is in all relevant respects the same linguistic entity as CMPR, though here rolled into the verbalizing affix.

An advantage of this direction might be that it would force comparative suppletion of the root in the verbal environment, without recourse to the comparative morpheme itself. No analogue of the SSG is expected on this account. Since the comparative morpheme per se is not implicated, there is no expected transitivity effect regarding the operation M, and it should be possible to derive degree achievements from adjectives that lack a morphological comparative, or for that matter, from adjectives that are not gradable (a simple change of state would thus be the difference from 0 (false) to 1 (true)).

I acknowledge a certain intuitive appeal to this direction, but it appears to stumble over the cases in which overt comparative morphology is contained in the deadjectival verbs, as in the verbs in (226) from regular comparatives, in all of the suppletive forms in Table 6.1 for which the comparative has regular comparative morphology (like *bett-er* as opposed to *worse*). What appears to be unattested is a form in which a comparative root allomorph occurs without comparative morphology as the base of a degree achievement, unless that root allomorph is a portmanteau in its regular comparative sense. We do not find *\*good – bett-er – (to) bett-en*, German *\*gut – besser – ver-bess-en* or Russian *\*plox-oj – xuz'-e (< xud-) – u-xud-et*.<sup>26</sup>

Acknowledging that important questions thus remain, I leave further exploration of this direction for future work.

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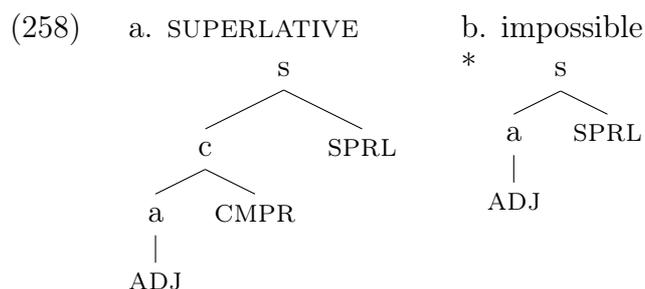
<sup>26</sup>I take it that the *-š-* in *u-xud-š-at* ‘(to) worsen’ is the comparative morpheme, although it does not trigger the palatalization of the stem seen in the comparative adjective; compare the segmentation offered in Zaliznyak (1977).

# Chapter 7

## Complexity, Bundling, and Lesslessness

### 7.1 Introduction

I have argued at length above that UG admits of no ‘superlative’ morpheme understood in the familiar sense as a morpheme that combines with an adjective X to yield the meaning ‘more X than all (others).’ In order to make sense of a wide range of data, I have posited that this meaning is always expressed bi-morphemically, as in (258a) (and/or in the branching-affix structure in (67)), with the comparative part (MORE) represented separately from the ‘than all others’ component (which latter I have glossed SPRL). Despite surface appearances in languages such as English, the structure in (258b) must be impossible.



The underlying bi-morphemic structure can be masked on the surface; for example, English *-est* appears to attach directly to adjectival bases, but is in fact mediated by an intervening, but phonologically null, allomorph of

the comparative (42). The decomposition of the superlative in this manner, even where not morphologically transparent, is the cornerstone of the account of (both parts of) the CSG and the SSG. In Chapter 6 I extended the account, arguing that a parallel generalization may hold of the derivation of deadjectival change-of-state verbs, requiring a parallel containment hypothesis.

The preceding chapters have explored in detail the consequences of these hypotheses, and the evidence for them, but I have for the most part refrained from speculating on their nature. How should the containment hypothesis be expressed formally, and why should it hold? It may be that this is an irreducible property of language — that UG provides a universal vocabulary in the sense that the set of (functional) morphemes is a closed class, with the (abstract) morphemes of any individual language drawn from this set (see, for example, Beard 1995). The discovery of what morphemes are in this set would then be an empirical matter; the present study constitutes an argument that the morpheme SPRL, meaning ‘than all others’ and necessarily combining with the comparative, is in the universal vocabulary, while a morpheme with the more complex meaning ‘more than all others’ is not.

But a more interesting question, of course, would be whether we could derive this result from some prior consideration. Rather than stipulating a universal morpheme vocabulary, one would like to understand in more general terms what the constraints are on possible and impossible morphemes, and answer to the question of why the more complex meaning is not in the universal functional vocabulary. Ultimately, it seems this will only push the question back to some degree: a component of this endeavour will have to include a list of some sort, but perhaps rather than morphemes as such, the list will be a list of features or other primitives that may combine to constitute morphemes, along with constraints on permissible combinations thereof.

This seems to be a promising line in the characterization of person features, for example. An argument originally due to Silverstein (1976) and Ingram (1978) and debated in much subsequent work, holds that the inventory of person categories (first, second, third; inclusive/exclusive) is explained by assuming that UG constructs the familiar categories (such as “first person exclusive”) out of exactly two binary (or privative) features:  $[\pm I, \pm \text{you}]$  (or some close variant thereof). The argument runs as follows (see Bobaljik 2008

for a review of the literature):<sup>1</sup>

Admitting only the three classical values of person (first, second, third) undergenerates, in failing to describe robustly attested exclusive versus inclusive contrasts in person marking (pronouns, agreement, clitics). The existence of monomorphemic ‘inclusive’ markers (meaning ‘we, including you’) suggests that feature composition is needed in addition: the inclusive category is [1+2]. Admitting of composition, along with the three values, yields the maximal seven-way contrast in (259a) (when cross-classifying features such as number, gender, etc. are factored out):

(259)

a. Possible	b. attested	c. binary
1+2+3 1+2	inclusive	[+I, +you]
1+3 1	exclusive	[+I, -you]
2+3 2	second	[-I, +you]
3	third	[-I, -you]

However, the seven-way contrast is famously unattested. The maximal attested contrast is the four-way contrast in (259b). Logically possible contrasts, such as a [2+3] versus [2] contrast in the plural (hearer and others, versus multiple hearers) are never attested as monomorphemic distinctions (though they are made compositionally).<sup>2</sup> Instead of the classical three-value

<sup>1</sup>Key contributions in this large literature include Sokolovskaja (1980), Cysouw (2003), Simon (2005); for related alternatives invoking a mix of privative and binary features, see Harbour (2006), Nevins (2007).

<sup>2</sup>The four-way contrasts amounts to five negative universals (see references above):

**U1** No language distinguishes [1+1] from [1+3].  
(No “choral” *we*)

**U2** No language distinguishes [2+2] from [2+3].  
(No “exclusive” 2, mentioned in main text)

**U3** No language distinguishes [1+2] from [1+2+3].  
(No “complete” person)

**U4** No language has minimal [1+3]. (Apparent examples are [+I,-you] dual)

**U5** No language has minimal [2+3]. (Apparent examples are [-I,+you] dual)

system, the two value binary system in (259c) — plus the general constraint that no morpheme may be specified for conflicting values of the same feature — provides for the description of all and only the attested person marking inventories. Inventories smaller than the maximum involve syncretism, with ‘natural’ syncretic patterns (characterized by underspecification of a possible contrast) outnumbering ‘unnatural’ patterns (presumably historical accidents) by a factor of roughly 9:1.<sup>3</sup>

The conclusion to be drawn from this data is that UG includes a set of primitives from which morpheme meanings are constructed. To date, the constitution of this set has resisted a language-external, functionalist account; see Levinson 1988 and discussion in Cysouw 2003, Bobaljik 2008; but see Wechsler 2010 for suggestions couched in terms of deixis and Theory of Mind.)

Returning to the realm of comparatives and superlatives, we should ask whether a plausible account of the primitives of meaning might be given that would force the containment hypothesis (as in (258)) from some prior and more general consideration, given a suitable inventory of primitives for morpheme meanings. Although I can do little more than speculate at this point, an obvious candidate is a limit on the maximal internal complexity of (functional) morphemes. A (syntactic) proposal of this sort was put forward in Kayne (2005, 212), as the *Principle of Decompositionality*, and similar ideas are entertained in related Cartographic approaches with rich sub-lexical decomposition:<sup>4</sup>

(260) UG imposes a maximum of one interpretable syntactic feature per lexical or functional element.

I suspect the stricture in (260) is too severe (even allowing for some leeway in what an ‘interpretable syntactic feature is, as Kayne recognizes), but that nevertheless, some version of a Complexity Condition in this general line may be correct. Most plausibly, it seems to me, limits on morpheme complexity will prove to be best stated in semantic, rather than syntactic terms — certain meanings are complex in ways that the resources of UG cannot pack into a single morpheme. (I return to a contrast with (260) in section 7.3

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<sup>3</sup>The figure is calculated from the data in the extensive survey reported in Cysouw (2003); the actual numerical data is reported only in an appendix to Cysouw (2001). See also Baerman et al. (2005).

<sup>4</sup>The context of this Kayne’s proposal is for a decomposition of *many,few* into an adjective plus a silent noun NUMBER.

below.) Hackl (2009) argues this point for *most*, contending that it must be analyzed compositionally as the superlative of *many*. In so doing, he argues that the resources of Generalized Quantifier Theory, which provides a monomorphemic meaning for *most* (Barwise and Cooper 1981), are too rich; the primitives which UG builds quantifier meanings out of should not have the power to construct a semantics of the proportional quantifier *most*, other than via (syntactic) composition.

Evidently, inasmuch as he invokes an element *-est* in forming the superlative from the adjective (or determiner), Hackl did not decompose far enough: the combination of the comparative degree operator and SPRL (containing at the least a universal quantifier and/or a definite determiner) is also more than can be combined into a single functional morpheme.<sup>5</sup>

If this is correct, then the Containment Hypothesis, as a condition specific to superlatives, need not be stated in UG at all. The impossibility of (37) follows on the one hand, since an attempt to combine a SPRL morpheme (meaning ‘than all (others)’) with the adjective root in the absence of a comparative element will simply fail to yield the meaning ‘more X than all (others)’, and on the other, because there cannot be a single, indivisible morpheme with the complex meaning ‘more than all (others)’. The Containment Hypothesis is in essence a consequence of the Complexity Hypothesis.

## 7.2 Lesslessness

A general complexity condition of this sort should manifest itself in a variety of detectable contexts.<sup>6</sup> If the CΔG is correct, and deadjectival change-of-state verbs systematically embed comparative adjectives (Chapter 6), then these provide another clue as to the range of meanings that may be expressed monomorphemically. In addition, there is one further generalization that may support the general idea of constraints on morpheme meanings, namely, the

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<sup>5</sup>The complexity condition, or Kayne’s (260), is a condition on abstract representations, but is not taken here to be a condition on vocabulary items, which may indeed define correspondences between a single exponent and multiple syntactic nodes; see the discussion of portmanteaus / cumulative exponence in Chapter 5.

<sup>6</sup>See Katzir and Singh (2009) for an attempt at a general theory that may be of this sort, reanalyzing cases of ‘missing’ quantifier types discussed in Horn (1989) and elsewhere. For other relevant recent work, see Penka (2007) on the (non-)existence of monomorphemic negative existential quantifiers. I do not attempt here to survey work on restrictions on quantifier types.

generalization I called *Lesslessness* in the Introduction.

- (261) Lesslessness  
 No language has a synthetic comparative of inferiority.

Comparison of superiority ('more X') is affixal in many languages, as in *long – long-er*, but comparison of inferiority ('less X') never is. In the schema in (262), the lower right hand cell is universally empty.

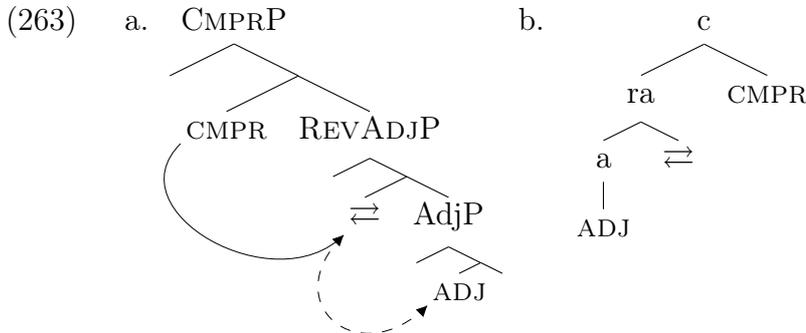
(262)		analytic	synthetic
	a. superiority	more ADJ	ADJ-er
	b. inferiority	less ADJ	*

This generalization is empirically the strongest of all the generalizations considered in this book.<sup>7</sup> In none of the languages examined for this study did anything remotely resembling a counter-example appear.

We might get some way (though not all the way) towards an understanding of (261) via the Complexity Hypothesis. Assume that elements meaning 'less (than)' are necessarily composed of the comparative operator > in tandem with an operator that reverses the polarity of a scale of measurement, which I will indicate as  $\rightleftharpoons$ . Such an operator has been invoked, for example, to relate polar antonyms, yielding the marked (i.e., negative) member in pairs such as *short – tall*: thus *short* is a portmanteau expressing  $[[ \text{TALL} ] \rightleftharpoons ]$  (see, e.g., Rullmann 1995, Heim 2006, Buring 2007 who call the operator LITTLE, and also the operator  $\circ$  in Katzir and Singh 2009). Assuming in addition that the combination of > and  $\rightleftharpoons$  is too complex to yield a single morpheme, then we might consider the underlying representation of a comparison of inferiority to be necessarily decomposed, along the lines in (263a):

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<sup>7</sup>Beyond mention for specific languages, the only prior mention of this generalization that I am aware of is in Cuzzolin and Lehmann (2004, 1213), for which no indication of the sample size is given. I believe this generalization has been widely suspected, but never (to my knowledge) systematically investigated in prior work.



If the lower instance of Merger (dashed arrow) in (263a) fails to apply, the result is a periphrastic comparison of inferiority: *less tall*. This treats *less* as a portmanteau spelling out CMPR +  $\rightleftharpoons$  (and is why Rulmann and Heim treat  $\rightleftharpoons$  as expressing LITTLE, in its quantificational sense, opposite of *much*). On the other hand, if  $\rightleftharpoons$  (and with it CMPR) do undergo Merger with the adjective, the result is as in (263b). This is the structure that would represent an analytic comparison of inferiority. On the other hand, the same structure is also the regular comparative of the antonymous adjective: if [ [ TALL ]  $\rightleftharpoons$  ] is pronounced *short*, then [ [ [ TALL ]  $\rightleftharpoons$  ] CMPR ] = *shorter*.

If it is plausible to treat  $\rightleftharpoons$  as (a species of) negation (see Buring 2007 for comment), then we find that the three pieces are overt in some languages. For example, in Komi, the comparative suffix *-ɕik* attaches to adjectives to form regular comparatives ((264a), from Lytkin 1966, 288), while *less-comparatives* are formed by adding the comparative suffix to the negative particle *abu*, as in (264b) (Hausenberg 1998, 314, see Coates 1982 for further discussion):

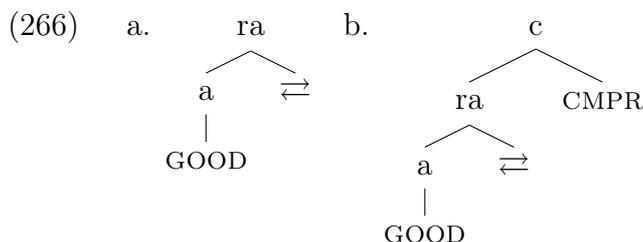
- (264) a. bur                   bur-ɕik  
          ‘good’               ‘good-CMPR’ i.e., ‘better’  
      b. mič<sup>j</sup>a             abu-ɕik mič<sup>j</sup>a  
          ‘beautiful’   ‘NEG-CMPR beautiful’ = ‘less beautiful’

Sonora Yaqui, as described in Dedrick and Casad (1999), appears to show a telling alternation. Comparatives in this languages are formed periphrastically, with the (sometimes optional) particle *čé'a*. For adjectives that have a lexical polar antonym, the comparative of the antonymous adjective is used (i.e., ‘more small’ for ‘less big’). But for adjectives that lack a polar antonym, negation is used to derive one, as in (265) among other examples (Dedrick and Casad 1999, 111), with the pieces of (263) all overt.

- (265) a. čé'a húni'i tú'ii  
 more even good  
 ‘it is even better’  
 b. čé'a húni'i kaa-tú'ii  
 more even not-good  
 ‘it is even worse’

In essence, if the Complexity Hypothesis can be invoked to force (263) to be the representation of comparatives of inferiority, the apparent universal absence of synthetic expressions of this construct becomes a blocking effect — there are synthetic *less*-comparatives after all, and in fact they abound, but they are pronounced as (-*er*)-comparatives of the polar antonym.<sup>8</sup>

Note also that decomposing antonymous adjectives in this way will interact with the adjacency condition, invoked (with some caveats) in Chapter 5. Under the view just considered, the representation of *bad* is now held to be the polar antonym of *good*, and thus internally complex, as in (266a), with the corresponding comparative in (266b):



English *worse* spells out the structure in (266b) and patently involves (at the least) a special form of the root in the environment of the comparative. Maintaining the adjacency condition would add a further reason to treat (at least some) portmanteaus as the spell-out of a complex  $X^0$ , either directly (as in Radkevich 2010) or after fusion (as in Chung 2007b and others), rather than as contextual allomorphy of terminals, with concomitant zero exponence

<sup>8</sup>It is necessary to prevent operations that would subvert this result. For example, if rebracketing under adjacency could perturb the structure prior to root insertion, the bleeding effect could be circumvented. To a large degree, the assumption that vocabulary insertion proceeds cyclically from the most deeply embedded node outwards (see Bobaljik 2000b, Embick 2010) will ensure that spell out of the node *ra* in (263b) will take precedence over alternatives, ensuring the blocking result just mentioned (see Chung 2009 for a demonstration of the complexities that can arise in this type of interaction).

of higher nodes. If *bad* is a portmanteau for the *ra* node in (266), then no adjacency violation arises with *worse*, which latter is either a portmanteau for the whole structure in (266b), or a contextual allomorph for the *ra* node, conditioned by the adjacent CMPR head.

A further issue that arises is the nature of adjectives that do not enter into antonymous pairings. For example, colour terms such as *blue* are gradable: *blue – bluer – bluest* — ‘Leo’s eyes are bluer than mine.’ They also enter into comparisons of inferiority: ‘My eyes are less blue than Leo’s’. And yet, there is no true polar antonym that would spell-out the morphological structure: [ [ BLUE ]  $\rightleftharpoons$  ]. The blocking account just sketched therefore does not extend to gradable adjectives that lack a polar antonym. A solution may be had by stipulating that adjectives which lack a polar antonym may not undergo merger with the head  $\rightleftharpoons$ : the dashed Merger operation in (263a) is unavailable for this class of adjectives. The logic here would then directly parallel the derivation of the SSG in section 3.4 — the addition of a higher head in the structure cannot ‘rescue’ an otherwise impossible lower step of merger, and only the periphrastic comparative *less blue* < [[ CMPR  $\rightleftharpoons$  ] BLUE ] is possible.

Although the appeal to the complexity condition in explaining (261) thus finds some initial plausibility, actually fleshing this out into a successful account will be tricky.

A potentially significant problem concerns alternative structures to (263). The complexity condition only ensures that CMPR and  $\rightleftharpoons$  enter the derivation as distinct heads, but it does not specifically require the hierarchical nexting in (263). If it is possible to entertain the opposite scope order ( $\rightleftharpoons$  > CMPR), or a branching affix structure (as considered for superlatives in section 3.2.2), the result from (263) will be undermined, and an alternative derivation for the universally unattested morphological comparison of inferiority will be opened up. I see no obvious way to exclude this at this point, and it looks like a serious lacuna in the direction suggested here.

More generally, there are some well-known concerns about the plausibility of using  $\rightleftharpoons$  as a means to derive antonymous adjective pairs. Authors who propose such a derivation often express some reservations (see Rullmann 1995, 96 and Heim 2006, 54-58). Thus, as Heim notes, a proposal such as (263) assigns the same structure, and thus the same logical meaning, to expressions such as *less fast* and *slower*, but it is not clear that they are entirely logically equivalent. Some of the differences have to do with evaluative (i.e., pragmatic (un)markedness) aspects of antonymous pairs (see

Rett 2008), which may be orthogonal to the structural question. In addition, if antonymous pairings truly are bi-morphemic, we should surely expect to see this in the productive morphology in some languages. In English, basic antonymous pairings (*good-bad*, *long-short* etc.) are rarely expressed in this way, and the domain of polarity-reversing affixes such as *un-* is quite limited. However, there are a number of languages in which fairly basic negative terms such as ‘bad’ are transparently derived from ‘good’ via negative morphology. An example from Sonora Yaqui was given in (265b); an analogous pattern occurs in Kham (Sino-Tibetan): *ca-o* ‘good’ – *ma-ca-o* ‘NEG-good’ = ‘bad’ (Watters 2002, 127), though suppletive antonymous pairings exist in these languages as well. A language in which the derived nature of the negative member of antonymous pairing is routinely transparent is Hixkaryana. Thus:

In Hixkaryana, there is a highly productive negative process, and antonymy is almost exclusively restricted to pairs where one item is a negative form derived from the same root as the positive form: *kawo* ‘long’ and *kawohra* ‘short’ ... *tiyoke* ‘sharp’ and *iyohra* ‘blunt’ ... *atahurmakaxaho* ‘one that is open’ and *atahurmakahni* ‘one that is shut’... (Derbyshire 1985, 14)

In sum, I take a derivation of negative adjectives in terms of a polarity-reversing (or negative) operator to be possible, though far from demonstrated. Building on that, the complexity condition envisaged here could underlie an account of the *Lesslessness* generalization in (261). I have sketched the beginnings of what such an account might look like, tying it to some existing proposals in the literature, but leave further exploration of this direction to future work.

### 7.3 Conservative decomposition

I suggested earlier in this chapter that the motivation for lexical decomposition is a complexity condition, which I speculated is ultimately semantic. The appeal to this condition as the basis for the Containment Hypothesis, and especially as a syntactic reflection of the markedness hierarchy POSITIVE < COMPARATIVE < SUPERLATIVE (Greenberg 1966, Canger 1966, Ultan 1972), raises the question of whether a much more radical lexical decomposition should be entertained. In the Nanosyntax framework version of the *Cartographic* framework, put forward in recent work by M. Starke and

colleagues, it is suggested that all markedness hierarchies should be cast as nested structures in the syntax (see e.g.. Caha (2009)). Recall also from the beginning of this chapter that Kayne (2005) entertains (260):

- (260) UG imposes a maximum of one interpretable syntactic feature per lexical or functional element.

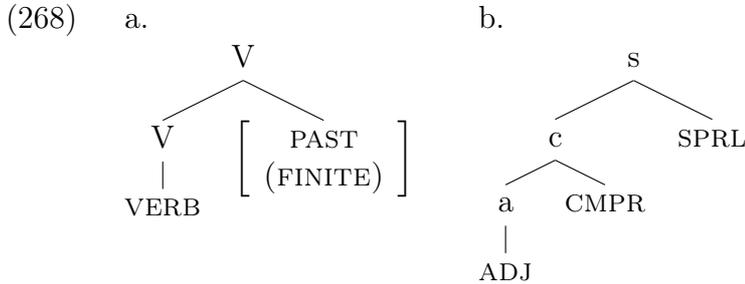
On both theory-internal and empirical grounds, I am led not to adopt this view, in favour of the more conservative perspective that the limit will be some (yet-to-be specified) measure of semantic complexity, rather than a narrow limit on syntactic features (interpretable or otherwise). Whether or not there is a substantive debate here depends on many definitional questions (is “comparative” a feature? what features are “interpretable?”), and deriving testable predictions depends on many other assumptions. In this section, I offer only a few remarks on the issues involved, with no pretense that the arguments are in any way conclusive.

### 7.3.1 Adjacency and Decomposition

Consider first the adjacency condition on allomorphy, adopted (albeit with reservations) in Chapter 5. The condition banned C from serving as a context for allomorphy of a root A in the configuration: [ [ [ A ] B ] C ]. The main work done by this condition in the current study lay in excluding the unattested AAB pattern in superlatives. In this regard, superlatives contrast minimally with the distribution of German verbal ablaut patterns, as described by Wiese (2004, 2005), discussed in section 5.4, where AAB patterns are attested. In both empirical domains, the account makes reference to a markedness hierarchy (see (267)):

- (267) a. present < participle < preterite  
b. positive < comparative < superlative

And in both domains, the hierarchies are represented as relations of proper containment. The feature structure of a less marked element in the hierarchy is properly contained in the feature structure of a more marked element on the hierarchy. This containment relation in each case triggers the Elsewhere effect, and leads to the exclusion of the unattested \*ABA patterns. But the nature of the containment differs slightly, as in (212), repeated here as (268):



The structure of superlatives assigns each meaningful element to its own terminal node in the structure in (268b), and here, I hold that this should follow from the proper version of the Complexity Hypothesis. With the adjacency condition, the superlative head is simply too far away from the root to condition allomorphy. By contrast, admitting a feature bundle in (268a) allows for AAB patterns in this domain — correctly, as discussed in section 5.4. In other words, both [PAST] and the combination [PAST, FINITE] may trigger stem readjustment, hence both must be sufficiently local to the root. If adjacency is the correct locality condition, and if these are both interpretable features, subject to (260), then (260) is overly restrictive in terms of the bundling it permits. Thus, if adjacency is the correct locality condition, we have a partial argument in favour of admitting bundling, as in (268a).

The argument for bundling can perhaps be made more general. Continuing to assume an adjacency condition on allomorphy, any root allomorphy conditioned by a combination of (interpretable) features will require that the features be bundled into a single node (otherwise, they could not be simultaneously adjacent to the root). German provides a handy illustration of this point.<sup>9</sup>

In addition to ablaut, some German strong verbs are subject to umlaut ( $a \rightarrow \ddot{a}$ , also  $e \rightarrow i$ ) in the second and third person singular of the present tense. The basic pattern is illustrated here, with *fahren* ‘to drive’:

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<sup>9</sup>If agreement features are not “interpretable”, then the German facts in (269) are not relevant to (260), though they may be relevant to a stronger version of no-bundling, as in Nanosyntax.

(269)	PRESENT		PRETERITE	
	SG	PL	SG	PL
	1	fahre fahren	fuhr fuhren	
	2	fährst fahrt	fuhrst fuhrst	
	3	fährt fahren	fuhr fuhren	

As the paradigms illustrate, the conditioning environments for umlaut are defined morphosyntactically: [2 SG (PRES)] and [3 SG (PRES)]. Both person and number features must be mentioned in the context of the readjustment rule. Hence, under the adjacency condition, both must be adjacent to the root, requiring a feature bundle.

The accounts of ablaut and umlaut, invoking adjacency, come together in a potentially interesting way. Assume that the general structure of German verbs is [[[ ROOT ] (TENSE) ] AGREEMENT ], a decomposition that is transparent in the ‘weak’ and ‘mixed’ conjugations: (*du*) *sag-te-st* ‘(you) say-PAST-2SG’ (see Bobaljik and Thráinsson 1998, Bobaljik 2002b for the proposal that tense and agreement may be bundled in some languages, but separate in others, along with a discussion of the syntactic consequences of such a distinction; see Thráinsson 2010 for a current assessment of apparent challenges). Positing an adjacency condition for readjustment rules requires that the present tense (which is morphologically unmarked, and treated as lacking features in (210b)) is entirely absent at the point where adjacency is computed (cf. Embick (2003, 2010) on ‘pruning’). By the same token, the ability of the past tense to trigger ablaut is not only consistent with the structure just given (tense, when present in the structure, is adjacent to the root), but it also implies that the tense marker will block the application of person-number conditioned readjustment (umlaut). That is, the considerations just given correctly predict the restriction of umlaut to the present (i.e. absence of) tense in German (see Bobaljik 2000a).<sup>10</sup>

<sup>10</sup>Recall from Chapter 5 that the adjacency condition holds of rules making reference to morphosyntactic conditioning environments, but is not expected to be a condition on phonological rules. Icelandic provides a contrast that seems relevant, but also a potential problem. Like German, Icelandic has a morphosyntactically (person-number) conditioned *i*-umlaut, which is restricted to the present (unmarked) tense, but Icelandic also has an *u*-umlaut rule, (*a* → *ö*) which is (morpho-)phonologically conditioned, triggered by an *u* in the next syllable (and subject to morphological restrictions). The *u*-umlaut rule occurs appears to occur across an overt tense marker: *ég tal-d-i* ‘I count-PAST-SG’ versus *við töl-d-um* ‘we count-PAST-1.PL’. On the other hand, Icelandic strong verbs are characterized by a number-conditioned vowel alternation in the preterite, which would appear to violate

In sum, I have argued above that a locality condition on contextual allomorphy, stated over the pre-exponence feature structures, provides a piece of the explanation of the CSG2 (the absence of AAB patterns). The hypothesis that structural adjacency is this condition leads to the conclusion that some bundling of features into complex terminal nodes is inescapable, as, at least in some cases, multiple features may condition allomorphy at a single root. Of course, adjacency may not be the correct formulation of the locality condition, which would require a reevaluation of this conclusion.

## 7.4 Concluding Remarks

I began this study with the observation that there are recurring cross-linguistic regularities in the domain of comparative suppletion. English *good*, *bad* compare via suppletion: *better*, *worse*, and both the superlatives (*best*, *worst*) and corresponding degree achievement verbs (*(to) better*, *(to) worsen*) are derived from the suppletive comparatives, and not from the positive roots. In undertaking a large, cross-linguistic survey, I have argued that these isolated facts of English form part of a broader network of intersecting generalizations, with sporadic apparent counter-examples plausibly susceptible to alternative explanations. The generalizations, to somewhat varying degrees of confidence, appear to constitute strong candidates for morphological universals.

I have accordingly offered theoretical explanations for these generalizations. The core of the account relies on the Elsewhere Condition as a factor regulating the competition among suppletive root allomorphs. In tandem with hypotheses about the structure of the relevant representations, most notably the claim that superlatives always contain comparatives, even where the morphology may be partly hidden, provides for an account not only of the observed forms, but crucially of the absence of patterns that appear to be systematically unattested.

I have argued that Distributed Morphology provides the right framework of core assumptions in which to couch the theory presented here, and have offered some arguments against conceivable alternatives. In so doing, I have also made suggestions regarding choices among competing assumptions in-

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the adjacency condition. Perhaps relevant here is the observation that the form of the preterite suffix itself is conditioned by number: weak *-ið-* SG  $\sim$  *-uð-* PL, and strong *-Ø-* SG  $\sim$  *-u-* PL, suggesting an adjacency-by-transitivity effect. I leave the detailed exploration of Icelandic from this perspective for a future project.

ternal to DM (such as the specific form a theory of locality might take). Two aspects of DM loom large in the results presented here. First is the realizational nature of the theory, which allows for competition among root allomorphs, regulated by the Elsewhere Condition. Coupled with the Containment Hypothesis, the Elsewhere Condition does the majority of the work in explaining the absence of ABA patterns in comparative suppletion. While many theories of inflection are realizational in nature, DM is distinguished from the majority of its competitors in assuming that the morphosyntactic representations that serve as input to rules of exponence are hierarchically arranged, and thus the output of the syntax. Other frameworks deny this, for example, A-morphous Morphology (Anderson 1992) holds that order and structure in morphology are introduced by, and not prior to, the rules of exponence. In an A-morphous framework (or its Word-and-Paradigm cousins), locality conditions cannot be stated over hierarchical arrangements of features, prior to their exponents being inserted. Thus, as a structural locality condition, the adjacency condition invoked in Chapters 2 and 5 to explain the absence of AAB patterns (the CSG2) is simply unstatable in an A-morphous framework, as are related conditions framed in terms, for example, of cyclic or phasal nodes (as in Embick 2010).

Leaving the details aside, by identifying apparently significant regularities over a large sample in precisely that part of morphology which is by definition the most irregular, and by showing how a relatively small set of generally current theoretical assumptions derive this regularity, the core message I hope to have offered here is a challenge to the view that morphology is in some way fundamentally unconstrained, that ‘anything goes,’ and that the best that can be hoped for in morphology is description. By contrast, I contend that there are universals of morphological structure to be discovered — and explained — and that current theoretical frameworks may be differentiated by the degree to which demarkation they define between the possible and the impossible accords with the division between attested and unattested. The success of morphological theories generally, and theories of suppletion in particular, should be judged not only on what attested forms they may describe, but also on how accurately they may predict differences in attested and unattested patterns over large samples: one goal, for example, is to exclude unattested *\*good – better – goodest*; simply getting *better* is not good enough.



# Appendices



# Appendix A

## The Broad Sample

This appendix reports the results of the broad sample, as described in section 1.3. There are 143 languages in this sample, which have been grouped into 5 broad geographic regions, with genetic affiliations as indicated. For each language, four properties are indicated to the extent data was available. Descriptions of additional languages were consulted, but were not included here if there was insufficient information about comparatives to make even a reasonably informed entry in the table. This was particularly true of indigenous languages of the Americas, where many descriptions fail to comment at all on the expression of comparison. This contributed to an underrepresentation of many of these languages in the overall dataset.<sup>1</sup>

The column headed **CMPR TYP** gives the type of comparative construction indicated in the descriptions consulted (cf. Stassen 1985, 2008). The three main values in this column indicate the three types of comparative construction set out (with additional examples) in section 1.4:

**EX** Exceed comparative; comparison is expressed by a verb meaning ‘exceed, surpass’ etc. in construction with the property-denoting predicate. An example from Tamashek is given here:

- (270) Ø-jàër-\a-hi                      t-à-yøtte  
3M.SG.S-surpass-\O-1SG FEM-SG-intelligence  
‘He is smarter than I’ lit: ‘He surpasses me in smartness.’  
(Tamashek, Heath 2005, 244)

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<sup>1</sup>Australian languages are also perhaps underrepresented; see Schweiger (1984) for an overview. Note that there are comparative affixes in some Australian languages, though I have as yet found no report of suppletion in adjectival gradation; although see n. 14.

**CNJ** Conjoined comparative; comparison is expressed via the conjunction of two clauses with, for example, antonymous adjectives, or adjectives representing differing degrees. An Itelmen example illustrates:

- (271) tinuʔn ʎeju-ʔn-č č'eβuzlaχ-aʔn, a xaŋnaʔn qaʔm  
these berry-PL-DIM sweet-PL, but those not  
'These berries are sweeter than those.' (Itelmen, field notes [SB14A])

**STND** Standard comparative; the standard of comparison is integrated into the clause by means of a particular morphosyntax, for example a *than*-phrase, as in English, or an oblique case marking. Most Indo-European languages are of this sort:

- (272) Leo is taller than Mika.

Languages with multiple strategies are indicated with multiple values in this column. As little hinges on these labels, I have followed the descriptions that I relied on, although it is not clear how clear-cut the difference is between, say, STND and STND; CNJ. Questionable classifications are marked with a question mark. Three languages are marked OTHER as the strategy for forming comparatives do not obviously fit into the three main types; see section 1.4 for additional discussion.

The column headed CMPR indicates the type of morphological expression of comparison associated with the adjective (or other property-denoting predicate, in languages which lack adjectives). The main values in this column are:

**M** Morphological (synthetic) expression of comparison. There is an affix (or morphological process) on the adjective that is associated with the expression of comparison. A language is classified as M if this strategy is available for at least some adjectives. Thus English would have an M in this table, for the *-er* suffix, even though not all adjectives may be so marked.

**PERIPH** There are no regular synthetic comparatives; comparison is expressed analytically, with an adverb (or other free element) that modifies the phrase headed by the adjective. Romanian is a language of this

sort, with all comparatives expressed on the pattern: *bun* ‘good’ – *mai bun* ‘more good’ = ‘better’.<sup>2</sup>

**ZERO** There is no marking of a comparative construction associated with the adjective (though there may be a mark on the standard). Most, if not all, exceed-type and conjoined-type comparatives are of this sort (see (270) and (271) above). This type is also common among standard-comparative languages. Japanese is a language with no overt marking of comparison:

- (273) Sally-wa Bill-yori kasikoi  
Sally-TOP Bill-FROM smart  
‘Sally is smarter than Bill.’ (Beck et al. 2004, 327)

The values (M) and (PERIPH) are used for languages in which an affixal or periphrastic expression is available, but described as optional. Udmurt illustrates an optional affix in (274) and Armenian an optional periphrastic marker (adverb) in (275).

- (274) kilometr iškem-leš vakči-(ges)  
kilometer mile-ABL short-CMPR  
‘A kilometer is shorter than a mile.’ (Winkler 2001, 40-41)
- (275) Artak-ə Bagrat-e-n (aveli) partsrahasag e  
Artak-DEF Bagrat-ABL-DEF more tall BE.3SG.PRES  
‘Artak is taller than Bagrat.’

Comparative-forming elements, especially adverbs, have been borrowed in many languages. Thus one finds Spanish *mas* or Portuguese *mais* forming periphrastic comparatives in South and Central America, and similarly with Russian *bole* among indigenous languages of the former Soviet Union. I have not included these constructions where the comparative is a clear calque, in particular, where it exists alongside a form or construction that is not an obvious borrowing. I have not, however, attempted to exclude borrowings generally. Thus, Mari (Finno-Ugric) (in the focussed sample in Appendix xx) has an optional comparative suffix *-rak* (Kangasmaa-Minn 1998, 237),

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<sup>2</sup>For the purposes of classification, Modern Romance languages such as French and Spanish are classified as PERIPH, as the only synthetic comparatives are suppletive, with all others periphrastic. See the text, especially Chapter 3.3.2, for discussion.

which seems likely to be a Turkic loan, as is the (periphrastic) superlative in the language.

The column headed SPRL indicates the type of morphosyntactic expression of relative superlative. Information was not available for many languages, an *n/i* in this column indicates “no information (available)”. M and PERIPH are as in the previous column. The other values are:

**ABS** The only superlatives indicated in the source are absolute superlatives.

**ALL** Superlatives are expressed by the comparative construction, with a universal quantifier serving as the standard of comparison.<sup>3</sup> Russian illustrates (see section 3.2.3):

- (276) Vanja vyš-e vse-x.  
Vanja tall-er all-GEN.PL  
‘Vanja is the tallest.’ (lit: ‘Vanja is taller than everyone.’)

**CMPR** There is no clear morphosyntactic distinction between comparatives and superlatives.

**VERY** The superlative is derived from the comparative by means of an intensifier. (It is not always clear that these are relative, rather than absolute superlatives, though they are presented as such in the three instances cited in this table).

**DEF** The superlative is derived from the comparative (if there is one) by a marker of definiteness (or, in one case, a nominalizer in this function).

**NONE** Descriptions report no fixed superlative constructions.

**OTHER** See notes at entry.

Many languages have multiple means of expressing superlatives, and I have not aimed for exhaustivity in this list. The primary aim has been to

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<sup>3</sup>I have included Nilo-Saharan languages Lango and Kanuri as being of this type; they are like the ALL cases except that in place of a universal quantifier, a kind noun serves as the standard. Thus in Lango, ‘elephants are the biggest animals’ is rendered ‘elephants are big exceeding (the) animals’ (Noonan 1992, 229). In Nuer, another Eastern Sudanic (Nilotic) language, the superlative is rendered as a comparative against the third person plural pronoun: roughly ‘surpasses (among) them’ (Crazzolara 1933, 55-56)

identify morphological superlatives, as these are most relevant to the concerns of this book. Two constructions in particular are not (systematically) noted in this table.

Quite a few languages may reportedly express a superlative meaning by a construction roughly equivalent to English *whiter than white*, i.e., where the property predicate is compared to itself. In the table below, such a construction is indicated for Udmurt, Kashmiri, Burushaski, Tyvan, and Khakas (as well as in other Turkic languages not included here). In no language that I have encountered is this the only means of expressing superlatives., and I have not indicated its occurrence in the table.

The final column indicates whether there is evidence of suppletion in comparative (and/or superlative) formation. Values in this column are:

**YES** There is suppletion.

**NO** There is no suppletion.

**MORE** The only pair for which suppletion is indicated is *many/much – more*. See section 4.3.

**n/i** No suppletion is indicated in the available description. Unfortunately, this last category is quite common; sources vary in how much confidence we may have that suppletion would have been noted had it been present. For many of the *n/i* languages, the commonly suppletive elements *good* and *many* are regular, suggesting suppletion in other adjectives is unlikely.

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
<b>Africa</b>					
Tamashek	Afro-Asiatic, Berber	STND; EX	ZERO	DEF	V
Hausa	Afro-Asiatic, Chadic (West)	EX	ZERO	ALL	n/i
Lele	Afro-Asiatic, Chadic (East)	EX	ZERO	n/i	n/i
Mina	Afro-Asiatic, Chadic (Daba)	STND; EX	ZERO	n/i	n/i
Qimant	Afro-Asiatic, Cushitic	STANDARD	ZERO	ALL	n/i
Somali	Afro-Asiatic, Cushitic	STND	PERIPH	PERIPH	n/i
Arabic (Standard)	Afro-Asiatic, Semitic (Central)	STND	M	DEF	n/i
Assyrian Neo-Aramaic	Afro-Asiatic, Semitic (Aramaic)	STND	(PERIPH)	DEF	n/i
Hebrew	Afro-Asiatic, Semitic	STND	(PERIPH)	PERIPH	MORE
Khoekhoe (Nama Hot-tentot)	Khoe (North Khoekhoe)	STND	ZERO	ALL	n/i
Khwe	Khoe (Kalahari)	STND; EX	ZERO	OTHER <sup>4</sup>	n/i
Koromfe	Niger Congo, Gur	EX	ZERO	NONE	NO
Ijọ	Niger-Congo, Ijoid	EX	ZERO	n/i	n/i
Kana	Niger-Congo, Benue-Congo (Ogoni)	EX	ZERO	n/i	n/i
Ogbroñuagum	Niger-Congo, Benue-Congo (Central Delta)	EX	ZERO	ALL	n/i
Banda	Niger-Congo, Volta-Congo	STND; EX	ZERO	ALL	n/i

<sup>4</sup>The positive form of the adjective is used, with the superlative sense derived from context; there are also periphrastic expressions meaning very roughly 'above all' or 'most'.

Lingala	Niger-Congo, Bantu, NW Narrow	EX	ZERO	ALL	n/i
Nandi	Niger-Congo, Bantu (Central J)	EX	ZERO	ALL	NO
Sotho (Northern)	Niger-Congo, Bantu (Central S)	EX	ZERO	n/i	n/i
Zulu	Niger-Congo, Bantu (Central B)	EX	ZERO	ALL, M?	n/i
Lango	Nilo-Saharan, E. Sudanic	EX	ZERO	ALL	n/i
Mbay	Nilo-Saharan, C Sudanic	EX	ZERO	PERIPH	n/i
Koroboro	Nilo-Saharan, Songhai	STND; EX	ZERO	ALL	n/i
Seno [=Songhay]					
Kanuri	Nilo-Saharan, W Saharan	STND; EX	(M)	ALL	n/i
<b>Eurasia</b>					
Irish	IE Celtic	STND	M	CMPR	Y
Modern Greek	IE, Hellenic	STND	M	DEF	Y
Kashmiri	IE, Indo-Aryan (Dardic)	STND	ZERO	ALL	n/i <sup>5</sup>
Persian (Farsi)	IE, Iranian (SW)	STND	M	M	Y
Czech	IE, Slavic	STND	M	M	Y
Finnish	Uralic, Finno-Ugric	STND	M	M	YES
Udmurt	Uralic, Permian	STND	(M)	ALL;	n/i
Nenets	Uralic, Samoyed	STND	M	M	?

<sup>5</sup>Kashmiri, like Hindi, has some borrowed adjectives (from Persian) which occur only in comparative/superlative meanings.

Ket	Yeniseyan	STND	ZERO	PERIPH; ALL	n/i
Even	Tungusic	STND	ZERO	ALL	n/i
Evenki	Tungusic	STND	M ?	M; ALL	n/i
Khalkha	Mongolian	STND	ZERO	ALL	n/i
Lezgian	Nakh-Dagestanian, Lezgiic	STND	ZERO	ALL	MORE ?
Hunzib	Nakh-Dagestanian, Tsezic	STND	ZERO	ALL	n/i
Abkhaz	Northwest Caucasian	STND	ZERO	ALL	n/i
Bashkir	Turkic	STND	(M)	PERIPH	n/i
Khakas	Turkic	STND	ZERO	PERIPH;	n/i
Tyvan	Turkic	STND	(PERIPH)	PERIPH,	n/i
Itelmen	Chukotko-Kamchatkan	CNJ	ZERO	NONE	NO
Chukchi	Chukotko-Kamchatkan	STND	M	M	n/i
Malayalam	Dravidian, Tamil	STND	ZERO <sup>6</sup>	VERY; ALL	n/i
Ainu	NE Asia, isolate	STND; EX	(PERIPH)	(PERIPH)	n/i
Nivkh	NE Asia, isolate	STND	(M)	ABS <sup>7</sup>	n/i
Burushaski	S Asia, isolate	STND	ZERO	ALL;	n/i
Yukagir	N Asia, isolate	STND	ZERO	ALL	n/i
Basque	Europe, isolate	STND	M	M	Y
American Sign Lan- guage (ASL)	Sign	CNJ; STND	M	M	NO

<sup>6</sup>The lack of morphological marking for comparative and superlative is reportedly characteristic of Dravidian Caldwell (1875, 211-212), (Steever 1998b, 19), Krishnamurti (2003, 29), but Elfenbein (1998, 398) reports the frequent, but optional use of a comparative suffix (borrowed from Persian via Balochi) in Brahui, a North Dravidian language geographically remote from the rest of the family.

<sup>7</sup>Reduplication - given with translation indicative of relative superlative; reduplication is otherwise very common as absolute superlative - this is the only example that appears to be relative XXX

**E. Asia**

Cantonese	Sino-Tibetan, Chinese	EX	ZERO	PERIPH	NO
Kunming	Sino-Tibetan, Chinese	STND; EX	(M)	(M)	n/i
Mandarin	Sino-Tibetan, Chinese	EX	ZERO	PERIPH	NO
Dzongkha	Sino-Tibetan, Tibeto-Burman (Tibetan)	STND	ZERO	PERIPH ?	n/i
Kham	Sino-Tibetan, Tibeto-Burman (Kham)	STND	ZERO	n/i	n/i
Limbu	Sino-Tibetan, Tibeto-Burman (E. Kiranti)	STND	ZERO	ALL	n/i
Newar (Dolokha)	Sino-Tibetan, Tibeto-Burman (Newari)	STND	ZERO	ALL	n/i
Bisu	Sino-Tibetan, Tibeto-Burman (Ngwi)	STND	ZERO	n/i	NO
Mongsen Ao	Sino-Tibetan, Tibeto-Burman (Naga)	CNJ; STND	M <sup>8</sup>	VERY	n/i
Dumi	Sino-Tibetan, Tibeto-Burman (W. Kiranti)	STND	ZERO	ALL	n/i
Lao	Tai-Kadai	STND; EX	ZERO	PERIPH; ALL	n/i
Thai	Tai-Kadai	STND	PERIPH	PERIPH	n/i
Japanese	East Asia	STND	ZERO	(PERIPH)	NO
Korean	East Asia	STND	(PERIPH)	(PERIPH)	NO

**Pacific**

<sup>8</sup>The element that forms comparatives in this language is a nominalizing affix that also forms nominalized relative clauses; thus a single form could be rendered as ‘(the) nearer (one)’ or ‘(the one) that is near’ (Coupe 2007, 61), making it less clear that it is correct to see the affix involved as representing a comparative structure per se.

Mayali (Bin- inj Gun-wok)	Australian, Gunwingguan (Gunwinggic)	CNJ; EX	ZERO	CMPR	n/i
Nunggubuyu	Australian, Gunwingguan (Enindhilyagwa)	CNJ	ZERO	NONE	NO?
Arrernte	Australian, Pama-Nyungan (Arandic)	STND	M	ALL	NO
Dyirbal	Australian, Pama-Nyungan (Dyribalic)	CNJ	M	n/i	n/i
Gumbaynggir	Australian, Pama-Nyungan (Gumbainggiric)	CNJ; STND	M <sup>9</sup>	M	n/i
Walpiri	Australian, Pama-Nyungan (South-West)	CNJ	ZERO	n/i	NO
Yindjibarndi	Australian, Pama-Nyungan (South-West)	CNJ; STND	ZERO	NONE	n/i
Kayardild	Australian, Pama-Nyungan (Tangkic)	CNJ; STND	ZERO	n/i	n/i
Jingulu	Australian, West Barkly	CNJ	ZERO	NONE	NO
Amis	Austronesian, E. Formosan	CNJ; EX	ZERO	PERIPH	n/i
Paiwan	Austronesian, Paiwan	STND	M	M	n/i
Puyuma	Austronesian, Puyuma	STND ?	M	M?	n/i
Rukai	Austronesian, Rukai	STND ?	M	M	n/i
Seediq	Austronesian, Atayalic	EX	ZERO	CMPR	n/i

<sup>9</sup>Both Smythe (1948) and Eades (1979) give a standard comparative construction alongside the conjoined comparative, but only the former gives a comparative suffix.

Rapanui	Austronesian, Malayo-Polynesian (Oceanic, E. Nuclear Polynesian)	STND; EX	PERIPH	ALL	n/i
Maori	Austronesian, Malayo-Polynesian (Oceanic, E. Nuclear Polynesian)	STND	PERIPH	VERY	n/i
Muna	Austronesian, Malayo-Polynesian (Sulawesi - Munic)	STND	ZERO	n/i	n/i
Pendau	Austronesian, Malayo-Polynesian (Sulawesi - Tomini)	STND	M	n/i	n/i
Yapese	Austronesian, Malayo-Polynesian (Oceanic, Yapese)	STND	ZERO	PERIPH	n/i
Palauan	Austronesian, Malayo-Polynesian (Palauan)	STND	ZERO	n/i	n/i
Fijian (Boumaa)	Austronesian, Malayo-Polynesian (Oceanic, W. Fijian-Rotuman)	CNJ; STND	(PERIPH)	n/i	n/i
Tuvaluan	Austronesian, Malayo-Polynesian (Oceanic, Samoic)	CNJ; STND; EX	PERIPH	OTHER <sup>10</sup>	n/i

<sup>10</sup>The positive form of the adjective is used, with the superlative sense derived from context; there are also periphrastic expressions meaning very roughly 'above all' or 'most'.

Manam	Austronesian, Malayo-Polynesian (Oceanic, W. Oceanic)	CNJ	ZERO	n/i	n/i
Sinaugoro	Austronesian, Malayo-Polynesian (Oceanic, W. Oceanic)	STND	ZERO	ALL	n/i
Amele	Trans-New Guinea, Madang	EX; STND ?	PERIPH ?	ALL	n/i
Klon	Trans-New Guinea, Timor-Alor-Pantor	STND	M	CMPR	n/i
Mian	Trans New Guinea, Central-Western (Ok)	CNJ	ZERO	PERIPH ?	NO
Ekagi	Trans New Guinea, Central-Western (W. Bomberai)	CNJ	ZERO	ALL <sup>11</sup>	n/i
Koiari	Trans New Guinea, Eastern (Koiarian)	CNJ; EX	ZERO	NONE	n/i
Mauwake	Trans New Guinea, Adelbert Range	CNJ; EX	ZERO	ALL	n/i
Arapesh	PNG Torricelli	STND ?	PERIPH	NONE	n/i
Semalai	Austro-Asiatic, Mon Khmer (Aslian)	CNJ; STND	M	n/i	NO
Vietnamese	Austro-Asiatic, Mon Khmer (Viet-Muong)	EX	ZERO	OTHER <sup>12</sup>	n/i
Khmer	Austro-Asiatic, Mon Khmer (Eastern, Khmer)	STND	PERIPH	PERIPH	n/i

<sup>11</sup>The Ekagi superlative is not exactly parallel to the conjoined comparative, but close enough for the purposes of this table.

<sup>12</sup>Property predicates are verbal, the superlative meaning is rendered with aspectual morphology.

Sapuan	Austro-Asiatic, Mon Khmer (Eastern, Bahnaric)	STND	ZERO	PERIPH	n/i
Palaung	Austro-Asiatic, Mon Khmer (Northern)	STND	ZERO ?	ALL	n/i
Mundari	Austro-Asiatic, Munda (North)	STND	ZERO	ALL	n/i
Santali	Austro-Asiatic, Munda (North)	STND	(PERIPH)	ALL	n/i
Remo	Austro-Asiatic, Munda (South)	STND	ZERO	ALL	n/i
<b>Americas</b>					
Aleut	Eskimo-Aleut	STND	ZERO	n/i	n/i
West Greenlandic	Eskimo-Aleut	STND	M	CMPR	n/i
Straits Salish	Salishan	CNJ	ZERO	NONE	n/i
Navajo	Na-Dene, Athapaskan	STND	M	M + PERIPH	n/i
Nishnaabemwin	Algic, Algonquian	STND	PERIPH	NONE	n/i
Cherokee	Iroquoian	STND	M	M	n/i
Kiowa	Kiowa Tanoan	STND	ZERO	CMPR; ALL	NO
Kiiiwa	Yuman (Hokan)	OTHER (CNJ)	M	n/i	n/i
Choctaw	Muskogean	EX	ZERO	n/i	n/i
Crow	Siouan	OTHER (V ASP)	M ?	n/i	n/i
Nahuatl	Uto-Aztecan, Nawan	STND	PERIPH	NONE	n/i
Comanche	Uto-Aztecan, Numic	STND	ZERO ?	NONE	n/i
Tumpisa	Uto-Aztecan, Numic	STND	ZERO	ALL	NO
Soshone					
Sonora Yaqui	Uto-Aztecan, Sonoran	STND	PERIPH	ALL	n/i

Tohono O'odham (Papago)	Uto-Aztecan, Sonoran	STND	PERIPH	VERY	n/i
Purepecha = Tarascan	N. Amer, isolate	OTHER	M ?	n/i	n/i
Totonac (Mis- antla)	N. Amer, isolate	STND	PERIPH	CMPR; ALL	n/i
Miskitu	Misumalpan	CNJ	(PERIPH)	ABS	n/i
Mixtec	Oto-Manguean	CNJ; STND	M	DEF <sup>13</sup>	NO ?
Wari'	Chapacuran	CNJ	ZERO	n/i	n/i
Yagua	Peba-Yaguan	CNJ; EX	ZERO	n/i	n/i
Bare	Arawakan, Northern (Central Upper Amazonian)	STND	(PERIPH)	n/i	n/i
Tariana	Arawakan, Northern (Eastern Nawiki)	STND; EX	M	PERIPH	n/i
Warekena	Arawakan, Northern (Western Nawiki)	CNJ	ZERO	n/i	n/i
Paumari	Arawan	CNJ;	ZERO <sup>14</sup>	n/i	n/i
Apalai	Carib	CNJ; STND	ZERO	n/i	n/i
Hixkaryana	Carib	CNJ; OTH <sup>15</sup>	ZERO	n/i	n/i
Bororo	Bororoan (Macro-Ge ?)	STND	ZERO	n/i	n/i

<sup>13</sup>The superlative is formed from the comparative by the addition of a nominalizing prefix, "yielding, in effect, 'the one that is more X', hence 'the X-est' (Macaulay 1996, 164).

<sup>14</sup>The Portuguese loanword *mais* 'more' can be used in the expression of comparison.

<sup>15</sup>One comparative strategy involves a relational element marking the standard, glossed as 'bigger than', and related to the word meaning 'above'; in the examples given, the phrase containing this element and the standard appears to act as the main predicate.

Kayapó	Jêan (Macro-Ge ?)	CNJ	ZERO	ABS	n/i
Pirahã	Muran	CNJ	ZERO	n/i	n/i
Mbyá (Guaraní)	Tupi-Guarani (Guaraní)	STND	M	ALL	NO
Urubu- Kaapor	Tupi-Guarani (Tupi)	CNJ; EX	ZERO	n/i	n/i
Andoke	S. Amer, isolate	STND	ZERO	ABS (PERIPH)	n/i
Aymara	S. Amer, isolate	STND; EX	PERIPH	PERIPH, ALL	n/i
Mapuche - Mapudungun	S. Amer, isolate	STND	PERIPH	ALL ?	
Mosetén	S. Amer, isolate	CNJ	ZERO	ABS	n/i
Urarina	S. Amer, isolate	EX	ZERO	ALL	n/i
Kwaza	S. Amer, isolate	CNJ ?	ZERO	NONE	n/i



# Appendix B

## The Focussed Survey

The following reports on the second stage of the database construction. This survey telescoped in on languages identified in the broad sample as having comparative morphology and/or comparative suppletion, then expanded outwards to more and less closely related languages, stopping where a point of diminishing returns seemed to have been reached. For example, morphological marking of comparison shows up in the Nakh languages, and thus I examined the Nakh-Dagestanian family; however, after 15 languages of the Dagestanian branches were all described as lacking a morphological comparison, I did not probe those language groups any deeper. In all, this survey has entries for 169 languages, of which 20 duplicate entries from Appendix A (20 languages are in both the broad sample and focussed survey). Between the two surveys, a total of 292 languages are reported on here.

The aim was to be reasonably comprehensive to the extent feasible, although coverage is uneven in various ways. As the references indicate, for some families more than for others, I relied on short sketches (such as those in Vinogradov et al. 1966-1968, and in the *LINCOM EUROPA* series), but consulted more extensive descriptions wherever I could, in particular where the sketches pointed to potentially relevant phenomena (as for example in Finno-Ugric). Relying on grammatical descriptions is the only feasible way to undertake a study of this breadth, but I acknowledge that my conclusions are not only at the mercy of the (highly variable) quality of the descriptions I relied on, but involve in addition a layer of interpretation on my part in comparing across differing traditions and terminologies, a potential source of error. Note in particular that some grammars do explicitly comment on the absence of suppletion, or of morphological comparisons of inferiority,

but many do not (indicated as *n/i* for ‘no information’ in the table). It seems a reasonable guess that many, if not most, of these languages lack suppletion, but the evidence is entirely circumstantial, namely: (i) suppletion/irregularity is generally noted elsewhere in these descriptions, hence should have been noted if it were attested in comparison; (ii) for many of these, the examples given include ‘good’ and ‘many’, by far and away the most commonly suppletive roots, hence if these are regular, chances are all other roots are as well; and (iii) where the facts are clear, languages with exclusively zero comparatives lack suppletion (with some possible exceptions meaning ‘more’, see section ??), and it is thus unlikely that the phenomenon exists only in those languages of this type where it happens to have escaped notice.

LANGUAGE	LINEAGE	CMPR	TYP	CMPR	SPRL	SUPPL
<b>Indo-European</b>						
Albanian	Albanian	PERIPH		PERIPH	NO	
Hittite	Anatolian	ZERO		n/i	n/i	<sup>1</sup>
Tocharian	Tocharian	ZERO?		n/i	n/i	
Armenian (Classical)	Armenian	(M)		ALL, CMPR	Y	
Armenian Middle	Armenian	PERIPH		DEF	n/i	
Armenian Western	Armenian	(PERIPH)		PERIPH; M; ALL	Y	
Armenian Eastern	Armenian	PERIPH		PERIPH, M	n/i	
Latvian	Baltic	M		M	Y	
Lithuanian	Baltic	M		M	NO	
Old Church Slavonic	Slavic	M		M	Y	
Belorussian	Slavic	M		M	Y	
Bulgarian	Slavic	M <sup>2</sup>		M	Y	
Czech	Slavic	M		M	Y	
Macedonian	Slavic	M <sup>3</sup>		M	Y	
Polish	Slavic	M		M	Y	
Russian	Slavic	M		M	Y	

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<sup>1</sup>See (Benveniste 1948, 126)

<sup>2</sup>Although described as a prefix, the comparative and superlative markers in Bulgarian and Macedonian are likely not (morphological) affixes; see section xx.

<sup>3</sup>See n. 2.

Serbian/Croatian	Slavic	M	M	Y
Slovak	Slavic	M	M	Y
Slovenian	Slavic	M	M	Y
Sorbian	Slavic	M	M	Y
Ukrainian	Slavic	M	M	Y
Old Irish	Celtic	M	M	Y
Breton	Celtic	M	M	Y
Irish	Celtic	M	CMPR	Y
Manx	Celtic	M	CMPR	Y
Scottish Gaelic	Celtic	M	CMPR	Y
Welsh	Celtic	M	M	Y
Latin	Romance	M	M	Y
Catalan	Romance	PERIPH	PERIPH	Y
French (Old)	Romance	M	PERIPH	Y
French (Modern)	Romance	PERIPH	PERIPH	Y
Italian	Romance	PERIPH	PERIPH	Y
Portuguese	Romance	PERIPH	PERIPH	Y
Romanian	Romance	PERIPH	PERIPH	NO
Spanish	Romance	PERIPH	PERIPH	Y
Gothic	Germanic	M	M	Y
English (Old)	Germanic	M	M	Y
Icelandic (Old)	Germanic	M	M	Y
Afrikaans	Germanic	M	M	Y
Danish	Germanic	M	M	Y

Dutch	Germanic	M	M	Y
English	Germanic	M	M	Y
Faroese	Germanic	M	M	Y
Frisian	Germanic	M	M	Y
German	Germanic	M	M	Y
German (Cimbrian)	Germanic	M	M	Y
Icelandic	Germanic	M	M	Y
Norwegian	Germanic	M	M	Y
Swedish	Germanic	M	M	Y
Yiddish	Germanic	M	M	Y
Greek (Ancient)	Hellenic	M	M	Y
Greek (Modern)	Hellenic	M	M	Y
Sanskrit	Indo-Aryan	M	M	Y
Bagri	Indo-Aryan	ZERO	ALL	n/i
Hindi	Indo-Aryan	ZERO <sup>4</sup>	ALL	Y <sup>5</sup>
Kashmiri	Indo-Aryan	ZERO	ALL	<sup>6</sup>
Marathi	Indo-Aryan	ZERO	ALL	n/i <sup>7</sup>
Sinhalese	Indo-Aryan	PERIPH	PERIPH	n/i

<sup>4</sup>In Hindi, Kashmiri and Marathi, morphological comparative and superlative marking, borrowed from Persian and Sanskrit, can occur on adjectives borrowed from those languages.

<sup>5</sup>see note from Rajesh xx

<sup>6</sup>The only reported superlatives are borrowings, which may not constitute grammatical superlatives, but instead pattern with English *optimal*.

<sup>7</sup>A form *bara*, glossed 'better' in (Pandharipande 1997, 223), appears unrelated to the form given for 'good' in that source.

Romani	Indo-Aryan	M	PERIPH	n/i
Romani (Vlakh)	Indo-Aryan	PERIPH	DEF	Y <sup>8</sup>
Persian (Old)	Iranian	M	M	? <sup>9</sup>
Balochi	Iranian	M	NONE	n/i
Gilyan	Iranian	M	ALL	Y
Kurdish, Kur- manji	Iranian	M	CMPR, PERIPH	Y
Kurdish, So- rani	Iranian	M	M	n/i
Ossetian	Iranian	M	ALL, PERIPH	Y
Pashto	Iranian	ZERO	ALL, VERY	n/i
Persian (Farsi)	Iranian	M	M	Y
Shugni- Rushan	Iranian	M	n/i	n/i
Tajik	Iranian	(M)	M; ALL	n/i
Talysh	Iranian	ZERO	PERIPH	n/i
Tat	Iranian	M	M	n/i
Wakhi	Iranian	(M)	n/i	n/i
Yagnobi	Iranian	ZERO <sup>10</sup>	ALL	n/i
<b>Uralic</b>				

<sup>8</sup>Pobožniak (1964) gives a suppletive form for *better*, but Hancock (1995) states that this is a relic, occurring in fixed expressions.

<sup>9</sup>The form *maθišta-* 'greatest' may serve as a superlative corresponding to *vazarka-* 'great' (see also Kent 1950, 201), an apparent instance of suppletion, but note corresponding (non-suppletive) positive *maz-*, *mazant-* in (Bartholomae 1904, 1158).

<sup>10</sup>M on some borrowings xx

Estonian	Fennic	M	M, ALL	YES
Finnish	Fennic	M	M	YES
Ingrian	Fennic		ALL	n/i
Karelian	Fennic	M	M, ALL <sup>11</sup>	YES
Livonian	Fennic	M	ALL, PERIPH, DEF	n/i
Lude	Fennic	M	ALL	n/i
Veps	Fennic	M	PERIPH, ALL	YES
Votic	Fennic	M	PERIPH, ALL	YES
Saami (North)	Saamic	M	M	n/i
Saami (South)	Saamic	M	M	n/i
Saami, Kildin	Saamic	M	M	YES
Hungarian	Hungarian	M	M	YES
Khanty (Ostyak)	Khanty	ZERO	n/i	n/i
Mansi (Vogul)	Mansi	(M)	PERIPH	n/i
Mari (Cheremis)	Mari	(M)	PERIPH	n/i
Mordva	Mordvin	ZERO	PERIPH, ALL	n/i
Komi	Permian	M	PERIPH	n/i
Udmurt	Permian	(M)	ALL	n/i
Nenets (Yu- rak)	Samoyed	M	M; ALL	n/i

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<sup>11</sup>Some dial lack M-SPRL (see Nau, Rjagoev) xx

Nganasan (Tavgy)	Samoyed	M? <sup>12</sup>	n/i	? <sup>13</sup>
Selkup	Samoyed	ZERO	PERIPH	n/i
<b>Altaic</b>				
Even	Tungusic	ZERO	ALL	n/i
Evenki	Tungusic	M (?)	M; ALL	n/i
Manchu	Tungusic	ZERO	n/i	n/i
Nanai	Tungusic	ZERO	ALL ?	n/i
Negidal	Tungusic	(M)	(M)	n/i
Orochi	Tungusic	ZERO	PERIPH	n/i
Orok	Tungusic	(M)	ALL; VERY	n/i
Ulch	Tungusic	ZERO	PERIPH	n/i
Azeri	Turkic	(PERIPH)	PERIPH	n/i
Bashkir	Turkic	(M)	PERIPH	n/i
Chuvash	Turkic	(M)	PERIPH; ALL	n/i
Gagauz	Turkic	PERIPH	PERIPH	n/i
Karachay- Balkar	Turkic	(M)	PERIPH	n/i
Karaim	Turkic	M	PERIPH	n/i
Kazakh	Turkic	M	PERIPH	n/i
Khakas	Turkic	ZERO	PERIPH	n/i <sup>14</sup>

<sup>12</sup>Helimski (1998a:497) gives morphological comparatives for a small group of qualitative adjectives, but Tereshchenko (1979:130-131) argues that these are augmentative and not comparative in meaning.

<sup>13</sup>Castron (1854 [1966]:189) gives four words for Nganasan that occur only as comparatives, namely, words for 'better', 'more', 'less/fewer', 'worse'. Although this is suggestive of suppletion, the available data is insufficient to draw firm conclusions.

<sup>14</sup>The difference between Khakas, which allows for the diminutive particle *arax* following the adjective in the comparative,

Kirghiz	Turkic	(M)	PERIPH	n/i
Kumyk	Turkic	PERIPH	PERIPH	n/i
Nogai	Turkic	ZERO	PERIPH	n/i
Shor	Turkic	ZERO	PERIPH	n/i
Tatar	Turkic	(M)	PERIPH	Y
Turkish	Turkic	(PERIPH)	N	N
Turkic, Old	Turkic	M	PERIPH	Y? <sup>15</sup>
Turkmen	Turkic	ZERO ?	ABS	n/i
Tyvan	Turkic	ZERO	PERIPH	n/i
Uyghur	Turkic	M	PERIPH	n/i <sup>16</sup>
Uzbek	Turkic	(M)	PERIPH	n/i
Bonan	Mongolian	ZERO	n/i	n/i
Buryat	Mongolian	ZERO	VERY	n/i
Dagur	Mongolian	ZERO	<sup>17</sup>	n/i
Kalmyk	Mongolian	ZERO	PERIPH	n/i
Khalkha	Mongolian	ZERO	ALL	n/i
Moghol	Mongolian	M <sup>18</sup>	M	n/i
Mongghul	Mongolian	ZERO	n/i	n/i
Oirat	Mongolian	ZERO	n/i	n/i
Ordos	Mongolian	ZERO	n/i	n/i

and the Turkic languages with the optional comparative suffix *-rax* may be an artefact of the descriptions.

<sup>15</sup>See NOTE on *yeg* in OCS

<sup>16</sup>xx NB, one form for 'luchshij is not regular good'

<sup>17</sup>The only strategy indicated is the *whiter than white* construction mentioned above, also available in other Mongolic languages, and attested in Middle Mongol p.68 - xx

<sup>18</sup>Mongolic languages generally lack morphological comparatives; the morphology in Moghol is comparative *-tar* and superlative *-tar-iin*, borrowed from Persian.

Santa	Mongolian	ZERO	n/i	n/i
Shira Yughur	Mongolian	ZERO	<sup>19</sup>	n/i
<b>Yeniseian</b>				
Ket	Yeniseian	ZERO	ALL	n/i
Kott	Yeniseian	ZERO	CMPR; ALL	Y? <sup>20</sup>
Yugh	Yeniseian	(M)	ALL	n/i <sup>21</sup>
<b>Chukotko-Kamchatkan</b>				
Itelmen	Chukotko-Kamchatkan	ZERO	n/i	NONE <sup>22</sup>
Alutor	Chukotko-Kamchatkan	ZERO	M	n/i
Chukchi	Chukotko-Kamchatkan	M	M	n/i
Kerek	Chukotko-Kamchatkan	M	M	n/i
Koryak	Chukotko-Kamchatkan	M	M	n/i
<b>Kartvelian</b>				
Georgian	Kartvelian	M	M	Y
Mingrelian	Kartvelian	M	PEIPRH	Y
Laz (Chan)	Kartvelian	M	PERIPH	n/i <sup>23</sup>
Svan	Kartvelian	M	M	Y
<b>NW Caucasian</b>				
Abaza	NW Caucasian	PERIPH	n/i	Y

<sup>19</sup>The only strategy indicated is the *whiter than white* construction mentioned above, also available in other Mongolic languages.

<sup>20</sup>Werner, p.69 n.10 notes an apparent suppletive 'better' in CastrŌn, but suggests may be typo. Xx

<sup>21</sup>xx comparative suffix, but of dubious status; regular comparison zero + abl

<sup>22</sup>xx conjoined comparative; Vol, Bog give M -ceje, prob <Rus; not recognized 1993-; Vol gives sprl M, but abs only

<sup>23</sup>xx but Holisky says c=periph, sprl = all

Abkhaz	NW Caucasian	(PERIPH)	ALL	Y <sup>24</sup>
Adyghe	NW Caucasian	M? <sup>25</sup>	PERIPH	n/i
Kabardian	NW Caucasian	M?	PERIPH	Y? <sup>26</sup>
Ubykh	NW Caucasian	M	M	n/i
<b>Nakh-</b>				
<b>Dagestani</b>				
Chechen	Nakh	(M)	PERIPH	n/i
Ingush	Nakh	M	PERIPH	n/i
Batsbi	Nakh	M	M	n/i
Avar	Dagestani	ZERO	PERIPH	n/i
Andi	Dagestani	ZERO	n/i	n/i
Botlkh	Dagestani	ZERO	n/i	n/i
Bagvalal	Dagestani	ZERO	n/i	n/i
Tsez	Dagestani	ZERO	n/i	n/i
Hunzib	Dagestani	ZERO	ALL	n/i
Lezgian	Dagestani	ZERO	ALL	Y? <sup>27</sup>
Tabasaran	Dagestani	ZERO	ALL	n/i
<b>Semitic</b>				
Amharic	Afro-Asiatic, Semitic	ZERO	ALL	n/i

<sup>24</sup>xx comparison: adj is verb form + periph; suppletive forms are doublets

<sup>25</sup>The comparative element *nax*’ constitutes one word with monosyllabic adjectives; it is not clear whether this constitutes a prefix in the relevant sense.

<sup>26</sup>In Adyghe and Kabardian, the comparative marker *nax* sometimes occurs as a separate word and sometimes as a prefix (and sometimes both). It is not clear whether this should be considered a morphological comparative. The pair for ‘many’ – ‘more’ appears to be suppletive, though this is not entirely clear from the available sources.

<sup>27</sup>see note in text xx

Arabic, Standard	Afro-Asiatic, Semitic	M	DEF	n/i
Arabic Gulf	Afro-Asiatic, Semitic	M	DEF	n/i
Arabic, Moroccan	Afro-Asiatic, Semitic	M	DEF <sup>28</sup>	n/i
Assyrian Neo-Aramaic	Afro-Asiatic, Semitic	(PERIPH)	DEF	n/i
Hebrew, Biblical	Afro-Asiatic, Semitic	ZERO	ALL; DEF	n/i
Hebrew, Modern	Afro-Asiatic, Semitic	(PERIPH)	PERIPH	Y
Maltese	Afro-Asiatic, Semitic	M	DEF	n/i

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<sup>28</sup>In this language, superlatives are formed with the definite article without embedding the comparative.

# Appendix C

## Principal Sources

In addition to the published sources noted below, I am grateful to the large number of scholars and speakers who answered queries regarding specific languages, including:

A. Calabrese, W. U. Dressler, M. Peters, M. Weiss (Ancient Greek, Latin, Indo-European)

D. Kallulli (Albanian) H. Khanjian, B. Vaux (Armenian)

XXX (Lithuanian) R. Pancheva (Bulgarian) P. Čaha, I. Kučerová (Czech) S. Dyla (Polish) Zh. Glushan, N. Fitzgibbons, N. Radkevich, O. Tarasenkova (Russian) Ž. Bošković, M. Despić, M. Marelj (Serbo-Croatian)

xx, H. Koulidobrova (Ukrainian) R. Feldstein OCS

A. Carnie, E. Pyatt ?? Celtic J. Phillips xx,

A. Calabrese (Latin, Italian) P. Schlenker (French) S. Herdan (Romanian) C. Buesa-García (Spanish) M. DeGraff (Haitian Creole)

H. Broekhuis, H. van der Hulst (Dutch) S. Dyk (Frisian) S. Wurmbrand, W. U. Dressler, W. Öller, M. Prinzhorn, M. Hackl, U. Sauerland (German) xx Icelandic

R. Bhatt (Hindi)

B. Hettich (Ossetian) A. Kahnemuyipour, I. Cagri (Persian)

I. Laka (Basque)

L. Nash (Georgian)

M. Kelepir, N. Şener, S. Şener (Turkish) M. Erdal (Old Turkish)

Y. Sharvit (Hebrew)

P. Kiparsky (Finnish) A. Szabolcsi, K. Szendrői (Hungarian)

F. Mc Laughlin (Wolof) C. Creider, J. T. Creider (Nandi, Swahili) J. Rennison (Koromfe)

D. Harbour (Kiowa) A. R. Deal (Nez Perce) M. Macauley (Mixtec)  
 I.-T. C. Hsieh (Mandarin) I. Chung (Korean)  
 P. Zajkov, xx Karelian (  
 D. Lillo-Martin (ASL)  
 D. Nash (Warlpiri) R. Pensalfini (Jingulu)

## AFRICA

### **Afro-Asiatic**

Amharic	Cohen (1936)
Arabic (Gulf)	Holes (1990)
Arabic (Moroccan)	Ennaji et al. (2004), Harrell (2004)
Arabic (Standard)	Schulz et al. (2000), Ryding (2005)
Assyrian Neo-Aramaic	Arsanis (1968)
Hausa	Schön (1862), Migeod (1914), Robinson (1897)
Hebrew (Biblical)	Pratico and Van Pelt (2009), Joüon and Muraoka (2005)
Hebrew (Modern)	Glinert (1989)
Lele	Frajzyngier (2001)
Maltese	Aquilina (1959), Borg and Azzopardi-Alexander (1997)
Mina	Frajzyngier and Edwards (2005)
Qimant	Rossini (1912)
Somali	Saeed (1999)
Tamashek (Berber)	Hanoteau (1896), Heath (2005)
<b>Niger-Congo</b>	
Banda	Tisserant (1930)
Fulfulde	Taylor (1921), Labouret (1952)
Ijò	Williamson (1965)
Kana	Ikoru (1996)
Koromfe	Rennison (1997)
Lingala	Odhner (1981), Meeuwis (1998)
Nandi	Creider and Creider (1989)
Ogbronuagum	Kari (2000)
Sotho	Louwrens et al. (1995)
Swahili	Wilson (1970), Ashton (1947), Steere (1884)
Tswana	Cole (1955)
Wolof	Mc Laughlin (2004)
Zulu	Poulos and Msimang (1998), Doke (1963)

**Nilo-Saharan**

Koroboro Seno	Heath (1999)
Kanuri	Lukas (1937), Hutchison (1981)
Lango	Noonan (1992)
Mbay	Keegan (1997)
Nuer	Crazzolara (1933)

**Khoe**

Khoekhoe (Nama)	Meinhof (1909), Hagman (1977)
Khwe	Kilian-Hatz (2008)

## EUROPE AND NORTH

## ASIA

**IndoEuropean****Baltic**

Latvian	University of Latvia (1999)
Lithuanian	Ambrasas (1997), Vasiliauskiene and Slocum (2005-2007)

**Celtic**

Celtic (general)	Lewis and Pedersen (1937)
Breton	Hemon (1975, 1995), Ternes (1970)
Irish (Old)	Thurneysen (1909)
Irish (Modern)	O'Siadhail (1989), Doyle (2001)
Manx	Kelly (1859), Phillips (2004)
Scottish Gaelic	Calder (1990), Lamb (2003)
Welsh	Rhys Jones (1977)

**Germanic**

Gothic	Bopp (1856), Wright (1910)
English (Old)	Sievers (1882), Bosworth and Toller (1898)
Icelandic (Old)	Cleasby and Vigfusson (1874), Noreen (1923)
Afrikaans	Donaldson (1993)
Danish	Krymova et al. (1960)
Dutch	Broekhuis (1999)
English	Huddleston and Pullum (2001), oed-xx
Faroese	Thráinsson et al. (2004)
Frisian	Tiersma (1985)
German	xx DWDS-grammar
German (Cimbiran)	Schweizer (2008)
Icelandic	Einarsson (1945), Hólmarsson et al. (1989)

Norwegian	Kirkeby (1989), Strandskogen and Strandskogen (1986)
Swedish	Holmes and Hinchcliffe (2003), Prisma (1995)
Yiddish	Weinreich (1984), Jacobs (2005)
<b>Indo-Iranian</b>	
Sanskrit	Bopp (1856), Debrunner and Wackernagel (1929)
Bagri	Gusain (2000)
Hindi	McGregor (1972), Kachru (2006)
Kashmiri	Wali and Koul (1997)
Marathi	Pandharipande (1997)
Sinhalese	Garusinghe (1962)
Romani	Pobožniak (1964), Hancock (1995), Matras (2002)
Persian (Old)	xxx
Balochi	Rastorgueva (1966)
Gilyan	Rastorgueva et al. (1971)
Kurdish	Bakaev (1966), Thackston (2006b,a)
Ossetian	Abaev (1964), Isaev (1966), Hettich (2010)
Pashto	Tegey and Robson (1996)
Persian (Farsi)	Mace (2003)
Shugni-rushnan	Sokolova (1966)
Tajik	Rastorgueva (1963)
Talysh	Pirejko (1966), Schulze (2000)
Tat	Grjunberg (1966)
Wakhi	Pakhalina (1966)
Yagnobi	Khromov (1972)
<b>Romance</b>	
Latin	Lewis and Short (1879), Kühner and Holzweissig (1912), Weiss (2009)
Catalan	Badia Margarit (1962)
French (Old)	Bauer and Slocum (2006)
French (Modern)	Dietiker (1983), Judge and Healey (1983)
Italian	Grandgent and Wilkins (1915)
Portuguese	Perini (2002)
Spanish	Bruyne (1995)
Romanian	Nandris (1986)
<b>Slavic</b>	
Old Church Slavonic	Leskien (1962), Lunt (1959), Diels (1963), Vondrák (1900)

Belorussian	Mayo (1993)
Bulgarian	Hauge (1999), Alexander (2000)
Czech	Janda and Townsend (2000)
Macedonian	Friedman (2002), Lunt (1952)
Polish	Rothstein (1993)
Russian	Kuznecova and Efremova (1986), Katzner (1994), Garde (1998)
Serbo-Croatian	Stanojčić and Popović (1992), Browne (1993), Barić et al. (1997), Klajn (2005)
Slovak	Short (1993)
Slovenian	Herrity (2000)
Sorbian	Seiler (1830), Schuster-Šewc (1996)
Ukrainian	Shevelov (1993)
<b>Other Indo-European</b>	
Proto Indo-European	Bopp (1856), Kuryłowicz (1964), Weiss (2009)
Albanian	Kacori (1979)
Armenian (Classical, Middle)	Karst (1901), Krause and Slocum (2004)
Armenian (Middle)	Karst (1901)
Armenian (Western)	Riggs (1856), Bardakjian and Vaux (2001), H. Khanjian p.c.
Armenian (Eastern)	Kozintseva (1995), Dum-Tragut (2009)
Greek (Ancient)	Seiler (1950), Frisk (1960-1970), Chantraine (1967), Liddell and Scott (1996)
Greek (Modern)	Sofroniou (1962), Holton et al. (1997)
Hittite	Lehmann and Slocum (2005)
Tocharian (A,B)	Krause and Slocum (2007-2010)
<b>Uralic (Finno-Ugric, Samoyedic)</b>	
general:	Fuchs (1949), Nau (1992)
Estonian	Tauli (1973, 1983), Viitso (1998)
Finnish	Hakulinen (1957), Karlsson (2008)
Hungarian	Tompa (1968), Országh (1988)
Kamass	Castrén (1854), Künnap (1999)
Karelian	Rjagoev (1977), Nau (1992), Zajkov (1999)
Khanty (Ostyak)	Redei (1965), Gulya (1966), Abondolo (1998a)

Komi	Lytkin (1966), Coates (1982), Hausenberg (1998)
Livonian	Raun (1949), Nau (1992)
Lude	Nau (1992)
Mansi (Vogul)	Rombandeeva (1966), Keresztes (1998)
Mari (Cheremis)	Kovedjaeva (1966a,b), Kangasmaa-Minn (1998)
Mordva	Zaicz (1998), Ermushkin (2004)
Nenets (Yurak)	Castrén (1854), Décsy (1966), Salminen (1998)
Nganasan (Tavgy)	Castrén (1854), Tereshchenko (1966, 1979), Helimski (1998a)
Saamic	Sammallahti (1998)
Saami (Kildin)	Kert (1971)
Saami (North)	Nickel (1990)
Saami (South)	Bergsland (1982)
Selkup	Prokofjeva (1966), Helimski (1998b)
Udmurt (Votyak)	Tepljashina (1966), Csúcs (1998), Winkler (2001)
Veps	Zajtseva (1981), Nau (1992)
Votic	Ariste (1968), Nau (1992)
<b>Tungusic</b>	
Even	Benzing (1955), Malchukov (1995)
Evenki	Nedjlkov (1997), Bulatova and Grenoble (1999), Bulatova (1999)
Manchu	von Möllendorff (1892), Avrorin (2000)
Nanai	Avrorin (1982)
Negidal	Kolesnikova and Konstantinova (1968), Tsintsius (1982)
Oroči	Avrorin and Lebedeva (1968)
Orok	Petrova (1967)
Udihe	Sunik (1968a)
Ulch	Sunik (1968b)
<b>Yeniseian</b>	
Ket	Castrén (1858), Vall and Kanakin (1990), Werner (1997c), Vajda (2004)
Kott	Castrén (1858), Werner (1997a)
Yugh	Castrén (1858), Werner (1997b)
<b>Chukotko-Kamchatkan</b>	
Itelmen	Volodin (1976), and field notes
Alutor	Zhukova (1968a), Nagayama (2003)

Chukchi	Skorik (1961, 1977)
Kerek	Skorik (1968)
Koryak	Zhukova (1968b, 1972)
<b>Turkic</b>	
Azeri	Gadzhieva (1966)
Bashkir	Poppe (1964), Juldashvili (1966), Usmanova (2007)
Chuvash	Krueger (1961), Andreev (1966)
Gagauz	Pokrovskaja (1966)
Karachay-Balkar	Khabichev (1966)
Karaim	Musaev (1966)
Kazakh	Kenesbaev and Karasheva (1966), Krippes (1996)
Khakas	Karpov (1966)
Kirghiz	Hebert and Poppe (1963), Junusaliev (1966)
Kumyk	Magomedov (1966)
Nogai	Baskakov (1966)
Shor	Babushkin and Donidze (1966)
Tatar	Dmitrieva (1966), Zakiev (1966), Burganova et al. (1969), Zakiev et al. (1997)
Turkish	Lewis (1967)
Turkic, Old	Erdal (2004)
Turkmen	Azimov et al. (1966)
Tyvan	Sat (1966), Anderson and Harrison (1999), Harrison (2000)
Uyghur	Kajdarov (1966)
Uzbek	Sjoberg (1962), Reshetov (1966)
<b>Mongolic</b>	
Bonan	Hugjiltu (2003)
Buryat	Bertagaev (1968), Skribnik (2003)
Dagur	Tsumagari (2003)
Kalmyk	Todaeva (1968), Bläsing (2003)
Khalkha	Street (1963), Kullmann and Tserenpil (1996), Svantesson (2003)
Moghol	Weiers (2003)
Mongghul	Georg (2003a)
Oirat	Birtalan (2003)
Ordos	Georg (2003b)
Santa	Kim (2003)

Shira Yughur	Nugteren (2003)
<b>Kartvelian</b>	
Georgian	Aronson (1989), Hewitt (1995, 1996)
Mingrelian	Kipshidze (1914), Kiziria (1967), Harris (1991b)
Laz (Chan)	Marr (1910), Dirr (1928), Holisky (1991)
Svan	Topuria (1967), Gudjedjiani and Palmaitis (1986), Schmidt (1991)
<b>NW Caucasian</b>	
Abaza	Lomtatidze (1967a), Tabulova (1976), O’Herin (1995)
Abkhaz	Š. K. Aristava et al. (1968), Chirikba (2003), Hewitt and Khiba (1979), Hewitt (1991), Lomtatidze (1967b)
Adyghe	Jakovlev and Ashxamaf (1941), Rogava and Kerasheva (1966), Kumakhov (1967)
Kabardian	Shagirov (1967), Colarusso (1992)
Ubykh	Dumézil (1931)
<b>Nakh-Dagestanian</b>	
Chechen	Desheriev (1967b), Nichols (n.d.)
Ingush	Dolakova (1967)
Batsbi	Desheriev (1967a)
Avar	Madieva (1967)
Andi	Tsertsvadze (1967)
Botlkh	Gudava (1967b)
Godoberi	Gudava (1967c)
Karatin	Magomedbekova (1967a)
Akhvakh	Magomedbekova (1967a)
Bagvalal	Gudava (1967a)
Tindi	Gudava (1967d)
Chamalin	Magomedbekova (1967b)
Tsez	Bokarev (1967)
Hunzib	van der Berg (1995)
Lak	van der Berg (1995)
Dargi	Abdullaev (1967)
Lezgian	Haspelmath (1993)
Tabasaran	Magometov (1965)
<b>Dravidian</b>	

Dravidian (general)	Steever (1998a), Krishnamurti (2003)
Malayalam	Asher and Kumari (1997)
<b>Eurasia: Isolates</b>	
Ainu	Batchelor (1905), Refsing (1986), Tamura (2000)
Basque	Trask (1997, 2003), de Rijk (2008)
Burushaski	Berger (1999)
Nivkh	Krejnovich (1968), Gruzdeva (1998)
Yukagir	Maslova (2003)
SOUTHEAST ASIA	
<b>Sino-Tibetan</b>	
Cantonese	Matthews and Yip (1994)
Kunming	Gui (2000)
Mandarin	Li and Thompson (1981)
Dzongkha	van Driem (1998)
Kham	Watters (2002)
Lahu	Matisoff (1973)
Limbu	van Driem (1987)
Newar (Dolokha)	Genetti (2007)
Bisu	Shixuan (2001)
Mongsen Ao	Coupe (2007)
Dumi	van Driem (1993)
<b>Tai-Kadai</b>	
Lao	Morev et al. (1972), Enfield (2007)
Thai	Iwasaki and Ingkaphirom (2005)
<b>Other</b>	
Japanese	Martin (2004), Beck et al. (2004), Oda (2008)
Korean	Lukoff (1993), Underwood (1914)
AUSTRALIA	
Mayali (Bininj Gunwok)	Evans (2003)
Nunggubuyu	Heath (1984)
Arrernte	Strehlow (1942)
Dyirbal	Dixon (1972)
Gumbaynggir	Smythe (1948), Eades (1979)
Walpiri	Nash (1980), Simpson (1983)
Yindjibarndi	Wordick (1982)
Kayardild	Evans (1995)
Jingulu	Pensalfini (2003)

AUSTRONESIAN

Amis	He et al. (1986b)
Paiwan	Egli (1990)
Puyuma	Teng (2008)
Rukai	Zeitoun (2007)
Seediq	Holmer (1996)
Rapanui	Du Feu (1996)
Maori	Bauer (1983)
Muna	van den Berg (1989)
Pendau	Quick (2007)
Yapese	Jensen (1977)
Palauan	Josephs (1975)
Fijian (Boumaa)	Dixon (1988)
Tuvaluan	Besnier (2000)
Manam	Lichtenberk (1983)
Sinaugoro	Tauberschmidt (1999)

PAPUA NEW GUNIEA

Amele	Roberts (1987)
Klon	Baird (2008)
Mian	Fedden (2007)
Ekagi	Drabbe (1952)
Koiari	Dutton (2003)
Mauwake	Berghäll (2010)
Arapesh	Fortune (1942)

AUSTRO-ASIATIC

Semalai	Kruspe (2004)
Vietnamese	Thompson (1987)
Khmer	Huffman (1970)
Sapuan	XX
Palaung	Milne (1921)
Mundari	XX
Santali	Neukom (2001)
Remo	Fernandez (1967)

NORTH AMERICA

Aleut	Bergsland (1997)
Yupik (Siberian)	de Reuse (1994)
West Greenlandic	Fortescue (1984)
Straits Salish	Jelinek and Demers (1994)

Navajo	Young and Morgan (1987), Bogal-Allbritten (2008)
Nishnaabemwin	Valentine (2001)
Cherokee	Pulte and Feeling (1975)
Kiowa	Watkins and MacKenzie (1984)
Kiiiwa	Mixco (2000)
Choctaw	Nicklas (1979), Broadwell (2006)
Crow	Graczyk (2007)
Nahuatl (Classical)	Andrews (1975)
Comanche	Charney (1993)
Tumpisa Soshone	Dayley (1989)
Sonora Yaqui	Dedrick and Casad (1999)
Tohono O'odham (Papa- pago)	Zepeda (1983)
Purépecha (Tarascan)	de S. Juan Crisóstomo Nájera (1879), Foster (1969), Swadesh (1969), Chamoreau (2003)
Totonac (Misantla)	MacKay (1999)
Mixtec	Macaulay (1996)
Miskitu	Conzemius (1929)
SOUTH AMERICA	
Wari' Yagua	Payne and Payne (1990)
Bare Tariana Warekena	Chapman and Derbyshire (1991)
Paumarí	
Apalai	Koehn and Koehn (1986)
Hixkaryana	Derbyshire (1985)
Bororo Kayapó	Sala (1914)
Pirahñ	Everett (1986)
MbyĜ (GuaranĜ)	Pederson (1977)
Urubu-Kaapor	Kakumasu (1986)
Andoke	Landaburu (1979)
Aymara	Inojosa (1966)
Mapudungun	niga (2006), Smeets (2007)
MosetŃn Urarina Kwaza	

## C.1 Selected dictionaries consulted:

OED: DWB: <http://germazope.uni-trier.de:8080/Projekte/DWB> WDG: Wörterbuch der deutschen Gegenwartssprache: <http://www.dwds.de/> SAOD: Svenska Akademiens ordbok: <http://g3.spraakdata.gu.se/saob/>

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