

Universals in Comparative Morphology

Universals in Comparative Morphology

Suppletion, superlatives, and the structure of words

Jonathan David Bobaljik

University of Connecticut

revised: July 2011

Contents

Acknowledgments	xi
Abbreviations	xv
1 Introduction	1
1.1 Introduction	1
1.2 Distributed Morphology	10
1.3 Constructing the Database	24
1.4 Comparative Typology	28
2 Comparative Suppletion	39
2.1 Introduction	39
2.2 *ABA - Explaining a gap	46
2.3 UG vs. the European Sprachbund	58
2.3.1 The insignificance of the evidence	58
2.3.2 Counting cognates	61
2.3.3 (In)stability and change	65

2.4	Summary	71
3	The Containment Hypothesis	73
3.1	Introduction	73
3.2	Transparent Containment	74
3.2.1	Transparent Nesting	74
3.2.2	The Fennic Superlative: Branching Affixes?	82
3.2.3	Aside: More than anything	88
3.2.4	Interim Conclusion	96
3.3	Comparison and the Synthetic/Analytic Divide	97
3.3.1	Periphrasis, Suppletion, and Locality	98
3.3.2	Aside: Romance suppletion and Poser blocking	106
3.3.3	Periphrastic superlatives again	113
3.4	The Synthetic Superlative Generalization	116
3.4.1	Armenian superlatives	128
3.4.2	SSG: Loose ends	135
3.5	Containment and semantic considerations	138
3.6	Chapter summary	151
4	CSG: The Data	153
4.1	Adjectives	154
4.1.1	The Basque problem	165
4.2	Adverbs	171
4.3	Quantifiers	181

4.3.1	Many – more counterexamples	186
4.3.2	Coda: Bulgarian, Macedonian and the RSG	192
4.3.3	Afterthought: What’s <i>more</i> ?	195
4.3.4	Chapter summary	199
5	Theoretical Refinements	201
5.1	Introduction: Taking Stock	201
5.2	Conditions on Suppletion: exponence versus readjustment	205
5.3	Adjacency, ABC, *AAB	211
5.3.1	Getting <i>worse</i> : portmanteaus and locality	214
5.3.2	Aside: A cyclic alternative?	222
5.3.3	Adjacency - Outstanding Issues	226
5.4	AAB ablaut	232
5.5	Merger, Rule Ordering, Diacritics and Acquisition	240
6	Getting <i>better</i>: Comparison and deadjectival verbs	247
6.1	Introduction	247
6.2	Preliminary remarks	253
6.3	Deadjectival Degree Achievements: Doubting Dowty	258
6.4	To good, to badden, and to many	275
6.4.1	Ancient Greek <i>goods</i>	285
6.4.2	Baddening (up)	287
6.4.3	Moral goodness and ambiguity in Serbian	289
6.4.4	Russian: bad feelings	292

6.4.5	Multiplicity	295
6.4.6	Compounds and roots	297
6.4.7	Outstanding examples	302
6.5	Summary: What's the Difference?	304
7	Complexity, Bundling, and Lesslessness	307
7.1	Introduction	307
7.2	Lesslessness	314
7.3	Conservative decomposition: Adjacency and Bundling	325
7.4	Concluding Remarks	330
	Appendices	334
	A The Broad Sample	337
	B The Focussed Survey	357
	C Principal Sources	373
	Notes	393
	Bibliography	455

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 http://corpus.byu.edu/coca/

CONV	converb
COP	copula
CSG	The Comparative-Superlative Generalization
CΔG	The Comparative-Change-of-State 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	partitive
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> http://www.dwds.de/

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 (just over 300 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, the evidence from suppletion is far too scant for any observed patterns 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* (henceforth, an ABB pattern), with the a suppletive root common to both comparative and superlative, and for patterns such as Latin *bonus – melior – optimus* ‘good – better – best’ (ABC), with distinct roots in all three grades. What is disallowed (and virtually unattested) is a pattern in which only the comparative **good – better – goodest* (*ABA) or only the superlative **good – gooder – best* (*AAB) 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). The latter do not have a strictly comparative sense, and mean instead “ADJ to a very high or excessive degree”. For example, in Italian, there is a distinction

between relative superlatives on the one hand (formed by adding the definite article to the comparative): *il migliore* ‘the better’ = ‘(the) best’, *la più bella* ‘the more beautiful’ = ‘the most beautiful’, and absolute superlatives on the other (marked by the suffix *-issim-*) *buon-issim-o* ‘very, extremely good’, *bell-issim-a* ‘very, extremely beautiful’. Other affixes that form absolute (rather than relative) superlatives include 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-uj drug* ‘loyal friend’), and Modern Greek *-tat-os.*¹ Absolute superlatives are not subject to the generalizations laid out here, evidently because they lack the comparative component of meaning (and hence structure).²

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 categorical 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.³ 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:

- (8) a. **Late Insertion (Realization)** — 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 Condition (Subset Principle, 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, Chapter 2 of Embick 2010, 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 → ∅ /]_N ___ where N = *sheep, foot, ...*
 d. PL → -en /]_N ___ where N = *ox*
 e. PL → -s =/-z/ /]_N ___
 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 → 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

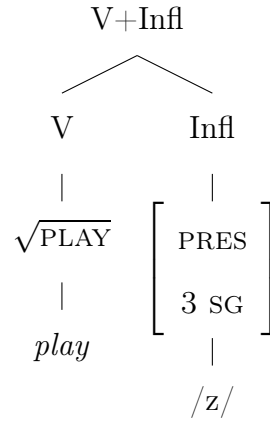
2000b). Another formalism within DM uses \Leftrightarrow expressing correspondence, rather than rewriting (see Halle and Marantz 1993, Embick 2010). Nothing of consequence turns on this distinction in the present work.

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).⁴ 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 representation, 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 informa-

tion omitted not relevant to the point):

(11) a. [[$\sqrt{\text{PLAY}}$]_V PRES,3,SG]



b. [[$\sqrt{\text{DOG}}$]_N PL] = *dog-z*

c. [[$\sqrt{\text{OX}}$]_N PL] = *ox-en*

d. [[$\sqrt{\text{BIG}}$]_A CMPR] = *big-er*

e. [[$\sqrt{\text{GOOD}}$]_A 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):⁵

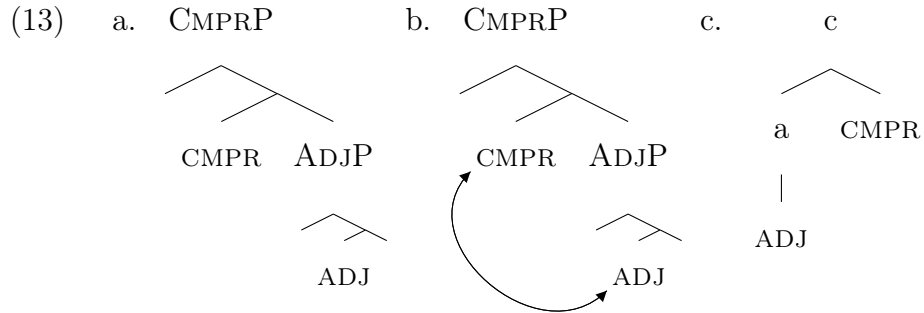
(12) If two (incompatible) rules R_1 , R_2 may apply to a given structure, and the context for application of R_2 is contained in that of R_1 , then, R_1 applies and R_2 does not.

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), 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).)⁶ 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 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)⁷, 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 CMPPR 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.

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 with 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.⁸

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) β may condition allomorphy for morpheme α only if the two are in the same morphological “word” (i.e., complex X^0): β may condition allomorphy for α in the environment in (14a) but not that in (14b), where a maximal projection intervenes (abstracting away from

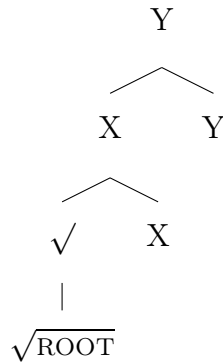
linear order). (An alternative formulation, in line with Embick (2010), would make reference to *phases* or *cyclic nodes*, in place of maximal projections, in (14b), relating the condition more closely to the discussion of cyclicity in the preceding paragraph.)

- (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, (14) 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.

(15)



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).⁹ 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 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: $\text{BAD} \rightarrow \textit{worse} / \text{ ___ }] \text{CMPR}$, and $\text{CMPR} \rightarrow \emptyset /]_A^+ \text{ ___ }]$,

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: [BAD, CMPR] \rightarrow *worse*, inserted at the top node in (13c). Radkevich (2010) proposes 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 over 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 148 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.¹⁰ 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). Taking the results of the broad sample (along with a *LinguistList* query and a literature review) as a starting point, I assembled a second survey, whose aim was for comprehensiveness, rather than breadth — to have as many data points 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 173 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 (with perhaps the sole exception of Cherokee) 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, each 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 En-

glish, 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) *quot – 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 islands 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 banimo ó-ta

Port Moresby NEU-TOP big and Vanimo NEU-EMPH

gwăab=o=be

small-PRD-DECL

‘Port Moresby is bigger than Vanimo.’ (Mian, Fedden 2007, 122)

- (19) tinuʔn ʌeŋu-ʔn-č č'eβuz-laχ-aʔn, a xaŋnaʔn qaʔm
 these berry-PL-DIM sweet-ADJ-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)

Roughly one out of every four to five languages makes use of a conjoined comparative as the primary or exclusive means of expressing comparison (34/167 languages in Stassen 2008, and 37/148 in my broad sample).¹¹

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).¹²

- (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) t̄a bi nī gāo
 he EXCEED you tall
 ‘He is taller than you’ (Mandarin, Li and Thompson 1981, 564)
- (23) Ø-jær-\a-hi t-à-yotte
 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 39/148 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.¹³

- (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 languages of this type were the only ones 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 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.¹⁴

- (26) a. Yaŋ kau tukta, man almuk.
 I MORE young you old
 ‘I am younger than you.’
- b. ...yapti-kī kau raya sa
 mother-my still alive COP?
 ‘...my mother is still alive.’

In any event, suppletion was not indicated in any description of the conjoined comparative languages.

Like the conjoined comparatives, it is not clear that there is any hidden comparative semantics, that would necessitate a grammatical comparative marker other than the verb in ‘exceed’ comparatives. No language in my sample has an identifiable comparative marker on the property-denoting predicate in such a comparative construction; to the extent this predicate has morphology different from what *big* would have in *The bear is big*, the morphology is what is expected from the general syntactic environment (e.g., a nominalization, as in (23)), or is a general (non-comparative) emphatic marker (see note 12).

Interestingly, a handful of ‘exceed’ comparative languages do show (apparent) suppletion.¹⁵ Wolof and Fulfulde/Pulaar, two related Niger-Congo languages lack a grammatical category of adjective, with quality-denoting

predicates patterning as verbs. These languages are typified by ‘exceed’ comparative strategies, however, they do have a handful of verbs with inherently comparative meanings, such as Wolof *sut* ‘be taller than’, used without the ‘exceed/suprass’ verb, as in the Wolof examples in (27a-d) from Mc Laughlin (2004 and personal communication); (see Labouret 1952 for comparable Fulfulde examples). Note that the comparative verb, unlike canonical examples of suppletion, does not block the regular ‘exceed’ comparative for *njool* ‘tall’, as in (27e), from Munro and Gaye (1991, 49).

- (27) a. Ibu moo nay
 Ibu 3S.SUBJ.FOCUS be.miserly
 ‘Ibu is miserly’
- 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 *-vfv-* ‘be better than’ (Heath 2005, 245).¹⁶ 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, it is not clear what expectations may hold for an analogue to the CΔG (cf. remarks on inceptives in section 6.4.4). The apparent suppletion in these language types 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

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:¹

(28)		POS	CMPR	
a. English:	good		bett-er	
b. Latin:	bon-us	mel-ior		‘good’
c. Icelandic:	gamall	eld-ri		‘old’
d. Georgian:	k’argi-i	u-mjob-es-i		‘good’
e. Upper Svan:	žyəd	xo-š-a		‘big’
f. Abkhaz:	a-c^wg^ja	j-ejc^wo-w		‘bad’
g. Basque:	on	hobe		‘good’
h. Estonian:	hea	pare-m		‘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 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 5.3.1.)

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

Adjectives in some languages also have a superlative grade, with the meaning “more ADJ than all others.” (Recall from the introduction that throughout this work, unless otherwise noted, I will restrict the term *superlative* to the sense of relative superlatives, excluding the “absolute” superlatives such as Italian *bell-issim-a* ‘very beautiful’.) Suppletion also extends to the superlative grade. In the majority of cases, the superlative and comparative forms share a common root, distinct from that of the positive (Ultan 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).

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

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, Welsh, Old Irish, and Middle Persian triples meaning ‘good – better – best’ constitute ABC patterns, as shown in (31):

(31)		POS	CMPR	SPRL	
	a. Latin:	bon-us	mel-ior	opt-imus	‘good’
	b. Welsh:	da	gwell	gor-au	‘good’
	c. Old Irish:	maith	ferr	dech	‘good’
	d. M. Persian:	xōb	weh/wah-īy	pahl-om/pāš-om	‘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.² 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 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 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 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 sections 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):

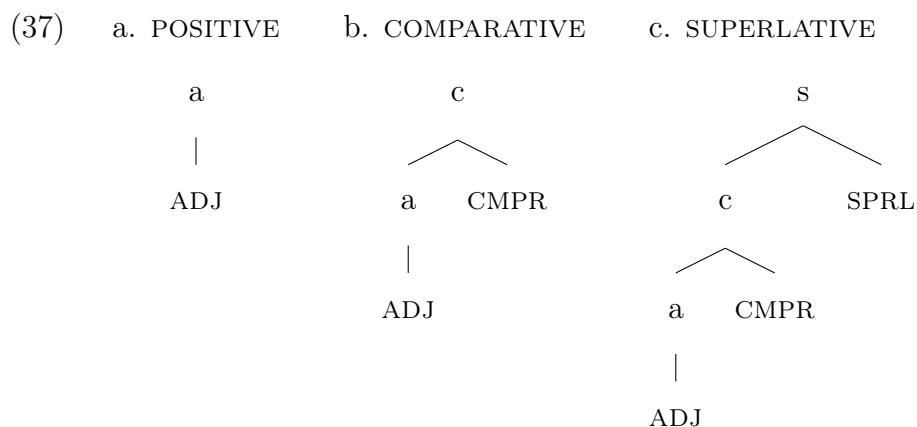
(35)		POS	CMPR	SPRL	
	a. Persian:	kam	kam -tar	kam -tar-in	‘little’
	b. Cimbrian:	šüa	šüan -ar	šüan -ar-ste	‘pretty’
	c. Czech:	mlad -ý	mlad -ší	nej- mlad -ší	‘young’
	d. Hungarian:	nagy	nagy -obb	leg- nagy -obb	‘big’
	e. Latvian:	zil -ais	zil -âk-ais	vis- zil -âk-ais	‘blue’
	f. Ubykh:	nüs [°] ə	ç’a- nüs [°] ə	a-ç’a- nüs [°] 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.³ Under certain assumptions, this can be seen as a cashing out of the markedness hierarchy positive < compara-

tive < superlative proposed in Greenberg (1966), Canger (1966) and Ultan (1972), a topic to which we return.⁴ 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*.⁵

- (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 diagrams. Also, as in (36a), I represent this as a suffixing structure, though what is of interest is the hierarchy (constituency), not linear relations (for example, the superlative exponent is a prefix in Czech).



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’:	mlad-ý	mlad-ší	nej- mlad-ší
	b. ‘bad’:	špatn-ý	hor-ší	nej- hor-ší

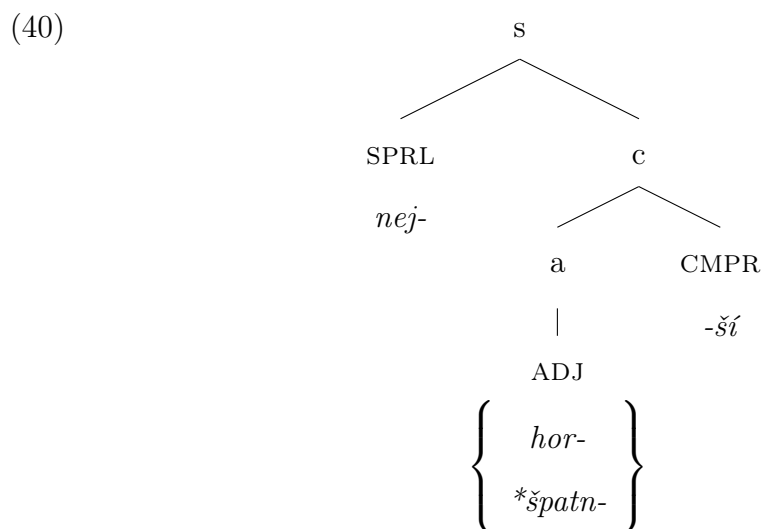
A fragment of the Czech rules of exponence (the Vocabulary) is given in (39).⁶

(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

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 selection 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

The assumptions above serve to effectively derive the CSG1 from the Containment Hypothesis and the assumption that rules of exponence are subject to Elsewhere ordering: the ABA pattern is unstatable as a formal pattern. 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. 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, there is a loophole, in the sense that it is in principle possible to generate a surface ABA pattern by appeal to accidental homophony. The grammatical pattern would necessarily be an ABC pattern, with three formally distinct root allomorphs, but where (the analogue of) (41a) would introduce the same phonological matrix as (41c), sandwiching the comparative allomorph between them. I suggest that the grammar per se does not exclude this possibility, but invoke the well-worn idea that there is a general anti-homophony bias in acquisition, of which (44) is a special case:

- (44) Anti-Homophony:

Learners avoid positing a contextual allomorph of a morpheme μ that is homophonous with the default exponent of μ .

If one thinks of rules of exponence as overwriting or rewriting rules, the essence of (44) is that learners will posit no rule of exponence of the form $X \rightarrow X$, which effects no change but serves 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). The proposal in (44) closes the loophole that would otherwise allow for false ABA patterns, arising as ABC patterns in disguise, despite the grammar universally excluding true ABA patterns. This leaves some wiggle room; one could consider the homophony strategy as a retreat of last resort with the implication perhaps that observationally, the CSG1 should emerge as a trend, rather than an absolute (compare Pertsova 2007). Accidents do happen after all. I will nevertheless resist this, and at least as a working strategy pursue the stronger claim that (44) is never violated, and thus that apparent ABA patterns must find alternative explanations. I return to this point in section 4.2 and Chapter 3.

Up to the loophole just mentioned, the preceding paragraphs have served to derive the first part of the CSG as a straightforward consequence of two main assumptions: the Containment Hypothesis and Elsewhere ordering. Another component of morphological theories is the question of locality. 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 (45) will fail, as the context in (45a) falls afoul of the adjacency condition.

- (45) 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 (45). I postpone further discussion of this point until section 5.3, concentrating on the *ABA cases until then.⁷

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 (46).

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

A variation of this description posits a single *degree* head (DEG) as in (47), of which both the comparative and superlative are possible values.

(47) [[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 (47), the ABB pattern among the roots in Czech could be described as in (48) (compare to (39) above), by making the degree head (common to both comparative and superlative) the context for the allomorphy.

(48) 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.⁸ 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 (49).

(49) POS CMPR SPRL EQUATIVE
drwg gwaeth gwaeth-a cyn-ddrwg ‘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 (50a-b)), or other intensifiers in the language, such as the suffix *-ink-* (50c). In both these cases, positing a suppletive allomorph in the context ___] DEGREE] would

incorrectly overgeneralize that allomorph to the equative and intensified or absolute superlative forms, respectively.⁹

(50)	POS	CMPR	SPRL	A.SPRL/INTNS	
a.	dobr-ý	lep-ší	nej- lep-ší	pře- dobr-ý	‘good’
b.	špatn-ý	hor-ší	nej- hor-ší	pře- špatn-ý	‘bad’
c.	mal-ý	men-ší	nej- men-ší	mal-ink-ý	‘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 (46) or (47), Latin would require a treatment as in (51).

(51)	a.	GOOD	→	opt-	/	__]	SPRL]
	b.	GOOD	→	mel-	/	__]	CMPR]
	c.	GOOD	→	bon-					

And therein lies the rub. Consider a pattern exactly like Latin, but without the rule in (51a). In a theory with the Containment Hypothesis, elsewhere ordering ensures that the allomorph in (51b) will automatically extend to the superlative environment, yielding the ABB pattern. But in a theory lacking the Containment Hypothesis, no such extension is guaranteed. 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 man-

ner 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 constraint 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.¹⁰

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, Finno-Ugric, Kartvelian, Northwest Caucasian and Basque), the CSG is trivially true. With the notable exception of the Cherokee example in (30j), 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’:

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

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; (52) 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 (52) represents the majority of Germanic, there are two or three additional cognate sets for Germanic ‘good’, illustrated in (53):

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

Swedish (53a) (also Norwegian) overlaps with (52) in the comparative and superlative, but differs in the positive root, thus we have BRA – BE(TT) – BE(TT). Another triple in (53b) 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 *gód* ‘good’ had two comparatives and superlatives, with the forms in (53c) 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 of 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.¹¹

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.¹² Languages with transparent nesting vary

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.¹³

(54)	POS	CMPR
a.	dobrŭ	dobr-ěi
b.	—	luč-ŭi
c.	—	unj-ŭi
(d.	—	sul-ŭi)

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.¹⁴

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

The consistency of the Slavic patterning (all suppletive patterns are ABB) is not the result of shared vocabulary, since the vocabulary items (roots) themselves are not shared. None of the suppletive patterns in (55) reflects roots in both the positive and comparative from the OCS patterns in (54). The Ukrainian and Czech comparative roots were not (so far as available sources indicate) comparatives of ‘good’ in OCS, and *bol-ji* (55d) 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:¹⁵

(56)	POS	CMPR	SPRL
a. Latin	parv -us	min -or	min -imus
b. OCS	mal -ŭ	mŕnj -ŕi	
c. Czech	mal -ŷ	men -ŕi	nej- men -ŕi
d. Gothic	leit -il-s	minn -iza	minn -ists
e. Danish	lille / små	mind -re	mind -st
f. Ancient Greek	mŕkr -ós	meŕ -on	meŕ -st-os

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 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 merely restates the description which the UG-based account aims to explain. Moreover, there is clear evidence 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 (54a). 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.¹⁶

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, *agath-os* ‘good’ formed only suppletive comparatives, but the adjective regularizes in Old Testament Greek (comparative: *agathō-ter-os*, superlative: *agathō-tat-os*; Liddell and Scott 1996).

In the other direction, innovative suppletive patterns arise where none existed before (AAA → ABB). Swedish *bra* (in (53a)) is one such example (the *SAOD* gives 17th century *braf – brafv-are – braw-ast-e*). Another may be provided by OCS *mŭnogŭ* ‘many’, which is given as undergoing regular comparison (*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).

(57)		POS	CMPR	SPRL
a. Gothic		alp -eis	alp -iz-a	
b. Old English		eald	ield -ra	ield -est
c. Old Icelandic		gamall	ell -re	ell -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 (57c)), 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 the relevant change is the resolution of doublets (as in (55)), the innovation of a new comparative root (as possibly in Slavic words for ‘many’ mentioned above (57)), or as in the change by which *little* in Old English was compared by *less* ((58b), compare (56)):

(58)		POS	CMPR	SPRL
a. Gothic		leit -il-s	minn -iza	minn -ists
b. Old English		lyt el	laess -a	laes -(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 Chapter 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 7 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 (59), of which nesting (see (36a)-(37) in Chapter 2) was a specific structural instantiation.

(59) 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.

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 n. 18 in Chapter 4), Batsbi, Ubykh, Chukchi, and Cherokee. Examples are given in (60) (where ‘X’ represents the adjectival root; these forms are not in all cases the only, or the most productive, exponents of the relevant degree morphol-

ogy):¹

(60)		CMPR	SPRL
a. Persian:	X-tær	X-tær-in	
b. Lithuanian:	X-iau	X-iaus-ia	
c. Cimbrian 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.²

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, 357). Even Modern English superlative *-est* is historically transparent, with the *-es-* portion sharing an origin with the comparative *-er*; compare the Gothic forms in (61a).³

(61)		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:		*-i̯os-, *-is-	*-is-to-s

Note that what is common in (60) and (61) 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 (60) 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;⁴ 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 (62) (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 (62a) and, with a definite pronoun/demonstrative-like element rather than the article, Romanian in (62b)) and in Modern Greek, in which morphological and periphrastic comparatives are in free variation, and both form superlatives with the definite article (as in (62c)). The pattern is attested as well in some varieties of Austrian German, including Upper Austrian (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).⁵

(62)		POS	CMPR	SPRL	
a. French:	gros	plus gros	le plus gros		‘big’
b. Romanian:	bun	mai bun	cel mai bun		‘good’
c. Greek:	psil-ós	pjo psil-ós	o pjo psil-ós		‘tall’
	or:	psiló-ter-os	o psiló-ter-os		
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 [(63)].”⁶

- (63) 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 $(?)aCCaC$):⁷

- (64) 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. Descriptions of this collection of dialects differ on exactly this point. Hancock (1995, 77) describes Vlach as being like Modern Romance: “*Maj* alone plus the adjective gives the comparative, ... while with the appropriate definite article it translates the superlative” (the comparative particle *maj* is a Romanian borrowing); Katsánis and Dínas (1990, 58) describes a similar formation with

the enclitic article for a Vlach variety spoken in Greece.⁸ Describing the Lovari variety, Pobožniak (1964, 45-46) treats it in Celtic-like terms, stating that there is no special 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)...”⁹ Weigand (1888, 73) gives a comparative + *all* construction for the superlative in another variety, with no mention of the definite article; while an Arumanian variety uses a borrowed superlative particle (see n. 29 in Chapter 4). 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

(63) shows), as well as Upper Austrian, all developed from ancestors with a distinct morphological 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.

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.¹⁰ The containment relation, and thus the affix order, are not obvious in the citation (nominative) forms (as in in (65)):

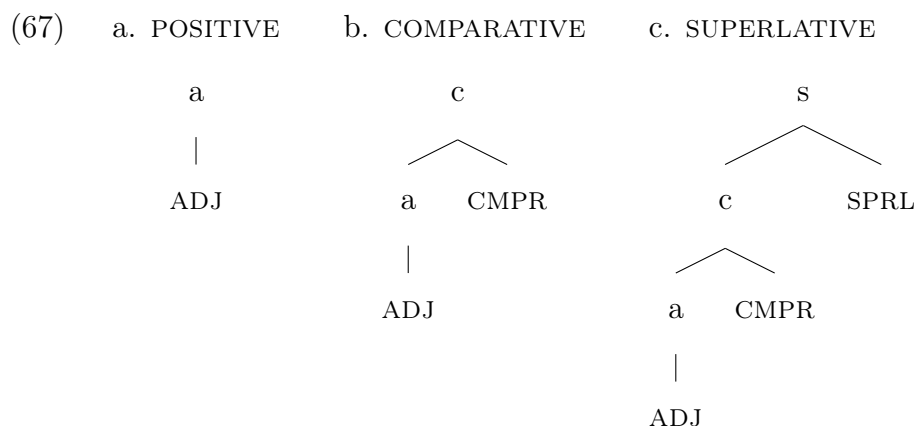
(65)	POS	CMPR	SPRL	
	a. paksu	paksu-mpi	paksu-in	‘thick’
	b. uusi	uude-mpi	uus-in	‘new’
	c. hyvä	pare-mpi	parha-in	‘good’

In nominative, complex morphophonology obscures the underlying forms of the affixes—comparative *-mpi* and superlative *-in* are in fact derived from *-mpa* and *-i-mpa*, respectively (see Hakulinen 1957). The containment relationship is transparent in oblique cases, such as the illative, shown in (66):

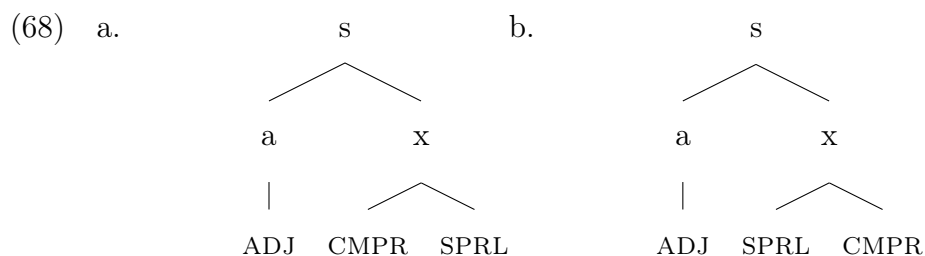
(66)	POS	CMPR	SPRL	
	a. paksu-un	paksu-mpa-an	paksu-i-mpa-an	‘thick’
	b. hyvä-än	pare-mpa-an	parha-i-mpa-an	‘good’

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-*),¹¹ but with respect to a nesting structure as in (37) of Chapter 2, repeated here as (67), the linear position of this superlative element (if

that is in fact what it is¹²) 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 (67) 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 (68a-b), which are hierarchically identical but differ only in the linear order of the comparative and superlative nodes under the placeholder node label *x*.¹³



The tree in (68b) 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 (65c) and (66b))? To make this concrete, the relevant fragment of the Finnish Vocabulary is given here, modeled on previous examples.¹⁴

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

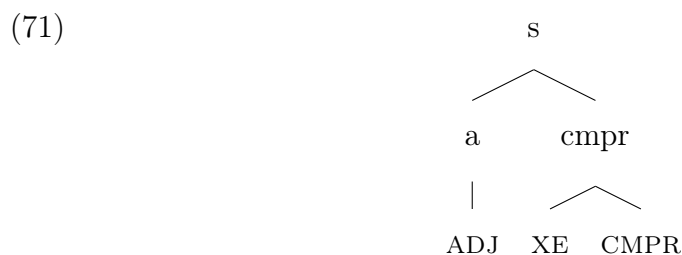
Broaching the question in any detail goes beyond what I wish to address in this chapter, and I will return to the question in Chapter 5. For now, I note that there are a variety of assumptions on the market that could yield the answer ‘yes’, in which case the account remains unchanged. For example, if the node x in (68) 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 (68b), satisfying the context for (69a). 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 (70a-b)). Basque also has a morphological means for expressing a slight degree of superiority (‘a little more X’), namely the suffix *-xe* (de Rijk 2008, 711).

This suffix occurs between the adjective root and the comparative (as in (70c)):

- (70) 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 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 (68b). In particular, the element *xe* is semantically a modifier, not the head of the complex affix, and hence the whole element is a (species of) comparative, even though linearly, *xe* intervenes between the adjectival root and the (regular) comparative exponent:



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 (72) shows (de Rijk 2008, 710-711):¹⁵

- (72) 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 (68b), a sub-part of a branching affix may stand in the right configuration to govern root allomorphy.¹⁶ 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 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.¹⁷

The structure in (68a) is also an alternative to consider for languages like Persian and Lithuanian in (60) (where both comparative and superlative are suffixal). For that matter, structures such as (68) 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 (73) (a-b are English, c-d Bulgarian; on the formal treatment of portmanteaus, see Chapter 5):

- (73) 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 (68) 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).¹⁸ 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 (67)) would require additional 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

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 (74).¹⁹

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

Like the constructions involving a marker of definiteness forming a superlative in combination with the comparative, these raise the question of what constitutes a grammatical superlative (as opposed to an expression with superlative meaning, but no grammatical superlative element). In this section, I discuss some observations regarding the construction type in (74a),

but ultimately this section is somewhat of an aside, as nothing in this discussion bears directly on the main arguments of the book, to which we return below.

The combination of a comparative (or sometimes positive) adjective with a universal quantifier, as in (74a), 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 (75):

- (75) a. van¹miz-leš¹ vil¹ (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)²⁰
 . . . all-ABL strong-CMPR
 ‘strongest’ (‘stronger than everybody’) (Nedjlakov 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 (76a). 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 (76b):

- (76) a. *ŋeeluki ŋin-duk eji-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.

- (77) a. *gita mira syũ moṭi he*
 Gita Mira from old be-PRES.3FS
 ‘Gita is older than Mira.’ (Gusain 2000, 38)
- b. *rajes se/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).

- (78) a. *nüü yuhupi üng kawiki ...*
 I fat you.OBJ more.than
 ‘I am fatter than you.’ (Dayley 1989, 291)
- b. *satü noohakka kawi 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 (79) shows, the superlative is rendered via comparison to all.

- (79) *’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:

- (80) mude ukwedlula bonke esikoleni
 he.is.tall suprass.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 Ogbronuagum (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:

- (81) əlugulu ká-ə́rísíí mú jó jóo-đeeri nééma jó tɛ
 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, ‘conjointed’-comparatives, as in the following example from Sinaugoro:

- (82) 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 (83). In this sentence, it is clearly implied that Vanya is one of the students.

- (83) 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 (84a). 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 (84b), again, just as in English.

- (84) 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 (85) clearly has the morphosyntax of the comparative, not that of the ‘tallest of all’ frame in (83). However, unlike (84a-b), there is no need for a separative word such as ‘other’ or ‘else’.

(85) 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).²¹

- (86) 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.
- 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 (86d) 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, (86f) 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/languageelog/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 (82), which is simply ignored in interpreting these sentences.²² 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).²³ The widespread 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 dis-

cussion 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 (as in Modern Greek and Votic, (87a-b)), and sometimes does not (as in Tikhvin Karelian (Rjagoev 1977, 96-97) and Russian (87c-d)):

(87)	POS	CMPR	SPRL	
a. M. Greek	kak-ós	cheiró -ter-os	o cheiró -ter-os	‘bad’
b. Votic	üvä	parə -pi	kəikkia parə -pi	‘good’
c. Tv Karel.	hüvä	pare -mbi	{ülen/suamo} hüvä	‘good’
d. Russian	plox -oj	xuž -e	samyj plox -oj	‘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 (87) 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:

(88) The Root Suppletion Generalization (RSG)

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

(89) 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.

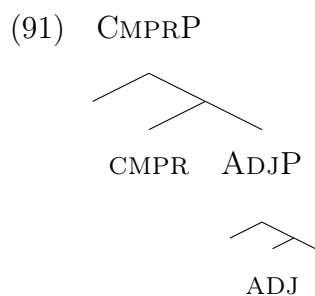
3.3.1 Periphrasis, Suppletion, and Locality

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) β may condition allomorphy for morpheme α 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

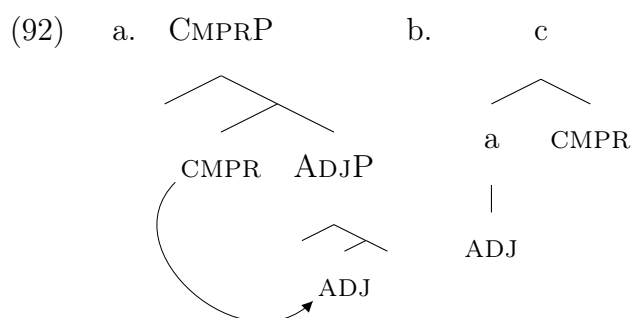
the same morphological word (complex X^0) as the root. Put differently, β may condition allomorphy for α in the environment in (90a) but not that in (90b), where a maximal projection intervenes (abstracting away from linear order). (An alternative formulation, in line with Embick (2010), would make reference to *phases* or *cyclic nodes*, in place of maximal projections, in (90b), although this does not differ in any way that is relevant to the present discussion, and I will make use of (90) in what follows.)

- (90) 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 (91), where a comparative head takes an adjectival phrase as its complement.²⁴



If nothing further happens, this yields a periphrastic comparative, like *more intelligent*. A morphological comparative is derived from the structure in (91) by means of an operation M which combines the two heads. This 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 (92a), yielding (92b) (= (37b) above).



Now, given the locality condition in (90), we make an immediate prediction. Where the structure that is subject to morphological exponence is that in (91), comparative suppletion will be blocked, but where the structure that feeds exponence is as in (92b), 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 adject-

tive, *kak-ós* ‘bad’ with comparative root *cheiró-*. Thus, we have the partial Modern Greek vocabulary in (93):

- (93) a. BAD → cheiró / ___] CMPR]
 b. BAD → kak-
 c. CMPR → -ter- /]_{ADJ} ___]
 d. CMPR → pjo

The restriction in (90) ensures that the two root allomorphs and two comparatives do not combine freely. If Merger (or head movement) applies, yielding (92b), then the affixal comparative (93c) is required, and, by the Elsewhere Principle, forces the comparative root allomorph in (93a). On the other hand, if there is no amalgamation of the two heads, and (91) is the input to the rules of exponence, then a periphrastic construction emerges. The comparative will be realized as *pjo*, since it is not affixal. At the same time, the comparative allomorph of BAD in (93a) is unavailable, since the comparative element is not within the same complex X^0 as the root. The periphrastic output is necessarily *pjo kak-ós*, and not **pjo cheir-ós*. The prediction of the locality condition is borne out (I include superlative forms here for reference though they are not directly relevant):

- (94) POS CMPR SPRL
 a. **kak-ós** **cheiró-ter-os** o **cheiró-ter-os** ‘bad’
 b. **kak-ós** pjo **kak-ós** o pjo **kak-ós** ‘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 (but see the discussion of (101) for an important qualification). 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):

(95)	POS	CMPR	SPRL	
a.	k'arg-i	u- k'et -es-i	sa-u- k'et -es-o	'good'
b.	k'arg-i	u- mjob -es-i	sa-u- mjob -es-o	'good'
c.	cud-i	u- ar -es-i		'bad'
d.	cot'a	nak'l -eb-i		'few'
e.	bevr-i	met' -i	u- met' -es-i	'many'

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

(96)	POS	CMPR	SPRL	
a.	k'arg-i	upro k'arg-i	q'vela-ze (upro) k'arg-i	'good'
b.	cud-i	upro cud-i	q'vela-ze (upro) cud-i	'bad'
c.	cot'a	upro cot'a	q'vela-ze (upro) cot'a	'few'
d.	bevr-i	upro bevr-i	q'vela-ze (upro) bevr-i	'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):²⁵

- | | | | | |
|------|----------------|--------------------------------|--------------------------------------|--------|
| (97) | POS | CMPR | SPRL | |
| a. | a-bzəja | jejhə i- bzəj -aw | zag' ra:sta jejhə i- bzəj -aw | 'good' |
| b. | a-bzəja | i- jejɬ ^j -u | | 'good' |

The same pattern arises in the Italian adjectives for 'good' and 'bad', given in (98), with similar patterns throughout Romance wherever a periphrastic comparative alternates with a suppletive one.

- | | | | | |
|------|----------------|--------------------|-----------------------|--------|
| (98) | POS | CMPR | SPRL | |
| a. | buono | migliore | il migliore | 'good' |
| b. | buono | più buono | il più buono | 'good' |
| c. | cattivo | peggiore | il peggiore | 'bad' |
| d. | cattivo | più cattivo | il più cattivo | 'bad' |

In some cases, the alternation between periphrastic and morphological comparatives may correlate with a meaning difference. French 'bad' (99) 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):

- (99)
- | | | | | | | |
|----|----------------|------|----------------|---------|----------------|------------------|
| | POS | | CMPR | | SPRL | |
| a. | mauvais | | pire | | le pire | ‘bad’ (abstract) |
| b. | mauvais | plus | mauvais | le plus | mauvais | ‘bad’ (concrete) |

There is thus a clear generalization to be stated here. This generalization is the Root Suppletion Generalization in (88), repeated here. As demonstrated with Greek, the RSG is simply a corollary of the locality condition in (90), applied to the structures assumed for the comparative morphosyntax in (91)-(92). Allomorphy (of which suppletion is a special case) can only be triggered within a morphological domain.

(88) The Root Suppletion Generalization (RSG)

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

What is excluded by (88), i.e., as a violation of (90), 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 (100):

- (100)
- | | | | |
|----|---------------|--------|-----------------|
| | POS | | CMPR |
| a. | good | * more | bett |
| b. | kak-ós | * pjo | cheir-ós |

Note that some care needs to be taken to distinguish the excluded, and unattested, construction type in (100) 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.²⁶

(101)		POS		CMPR	
	a. English	old		(more) old-er	
	b.	good		(more) bett-er	
	c. Late Latin	fort-is	(magis)	fort-ior	‘strong’
	d.	bon-us	(magis)	mel-ior	‘good’
	e. Mod. Greek	mikr-os	(pjo)	mikró-ter-os	‘small’
	f.	kak-os	(pjo)	cheiró-ter-os	‘bad’

Such ‘reinforcement’, though proscribed in (Modern) 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 (92)), 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 (101) are not.

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’.²⁷ 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 (100). 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 (90), 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 (102). 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 with a periphrastic construction, as there is for *mauvais* ‘bad’ (99), or for the Italian cognates in (98).²⁸

- | | | | | |
|-------|-----|------------|------------------|---------------------------|
| (102) | POS | CMPR | SPRL | |
| | a. | bon | meilleur | le meilleur ‘good’ |
| | b. | | *plus bon | *le plus bon |

Poser (1992) and Vincent and Börjars (1996) contend that the French example in (102) 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 (91), not just heads therein.²⁹ Poser-blocking is at odds with the locality condition in (90). In the configuration in (91), 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. This alternation is independent of suppletion and irregularity, 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):

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

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

(104)	POS	CMPR	SPRL	
a.	kal-ós	kalí-ter-os	o kalí-ter-os	‘good’
b.	kal-ós	pjo kal-ós	o pjo kal-ós	‘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’ that arises between regular (*smarter*) and suppletive (*better*) 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: *meillor* ‘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 giving up the otherwise well-motivated 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 French 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 (99), 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. (93)):

- (105) a. BAD → pire / $__$] CMPR]
 b. BAD → mauvais
- c. CMPR → \emptyset /]_{ADJ} $__$]
 d. CMPR → plus

From this perspective, the burden of proof lies squarely with those who

would invoke the additional mechanism (and weaker locality conditions) 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 — proponents of Poser-blocking may worry about how the Merger operation could be acquired by the French child, if there are no transparently segmentable instances of synthetic comparatives instantiating (92b) in the language. But this is a red herring. If the locality condition in (90) 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 (91). 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 (105c), 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 threat-

ens 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 (90) 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, 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 (90) 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 (87) repeated here:

(106)		POS	CMPR	SPRL	
	a. M. Greek	kak-ós	cheiró-ter-os	o cheiró-ter-os	‘bad’
	b. Votic	üvä	parə-pi	kəikkia parə-pi	‘good’
	c. Tv Karel.	hüvä	pare-mpi	{ülen/suamo} hüvä	‘good’
	d. Russian	plox-oj	xuž-e	samyj plox-oj	‘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.³⁰ The RSG contributes to the explanation of this difference. 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:³¹

(107)		POS	CMPR	SPRL	
	a. M. Greek	kal-ós	kalí-ter-os	o kalí-ter-os	‘good’
	b. Veps	čoma	čome-mb	keikiđ čome-mb	‘pretty’
	c. Tv. Karel.	hoikku		suamo hoikkua	‘thin’
	d. Russian	sux-oj	suš-e	samyj sux-oj	‘dry’

Combined with the locality restriction, the behaviour of the regular (non-suppletive) superlatives in (107) explains the suppletive patterning in (106). 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 (90)—the condition that derives the RSG—the CSG (i.e., CSG1) is predicted to hold only of those periphrastic constructions in which the superlative marker combines 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.³²

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 hüvä* ~ *para-š* ‘most good ~ best’ and Russian *samyj ploxoj* ~ *(nai)-xud-šij* ‘most bad ~ worst’ (the morphological form being rather literary).

And yet, the success of the predictions regarding (106) raises the specter of a problem concerning the Containment Hypothesis. Why *don't* the Tikhvin and Russian examples in (106)-(107) 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 (107c-d) therefore appear to challenge the Containment Hypothesis. Ultimately, I will argue that the forms in (107c-d) do satisfy the Containment Hypothesis (by containing a ‘hidden’ comparative morpheme), and that the difference in (107) 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 (107a-b), but where the comparative is instead contained in the superlative marker, the pattern in (107c-d) emerges. There are, however,

some steps needed in getting to this conclusion, and it is to this we now turn.

3.4 The Synthetic Superlative Generalization

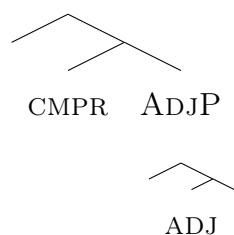
In the preceding section, I showed that the adoption of a relatively innocuous looking locality condition derives an apparently valid universal about the independence of root suppletion and periphrasis. I showed moreover that this condition interacts with different types of periphrastic superlative formation 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 (89). 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.

(89) The Synthetic Superlative Generalization (SSG)

No language has morphological superlatives (*X-est*), but only periphrastic comparatives (*more X*).

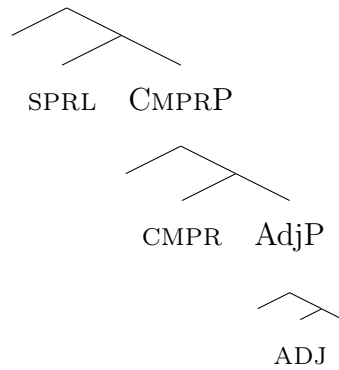
A priori, the SSG is not predicted in any obvious way under theories in which the superlative and comparative are merely two types of degree head, which can combine with adjectives (though it may be stipulated, for example, as part of a markedness hierarchy).³³ On the other hand, the SSG may follow from 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 (91), repeated here as (108), where a comparative head takes an adjectival phrase as its complement.

(108) CMPRP

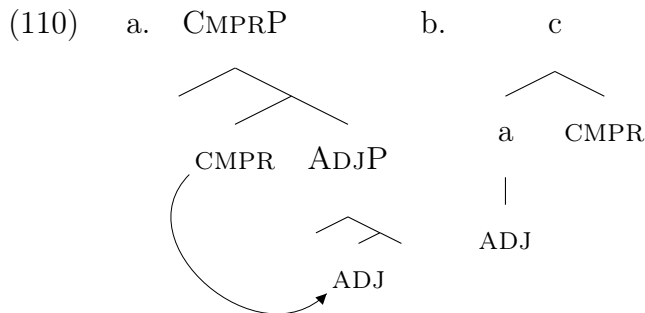


Under (the most straightforward implementation of) the Containment Hypothesis, the superlative properly embeds the comparative, thus (109):

(109) SPRLP



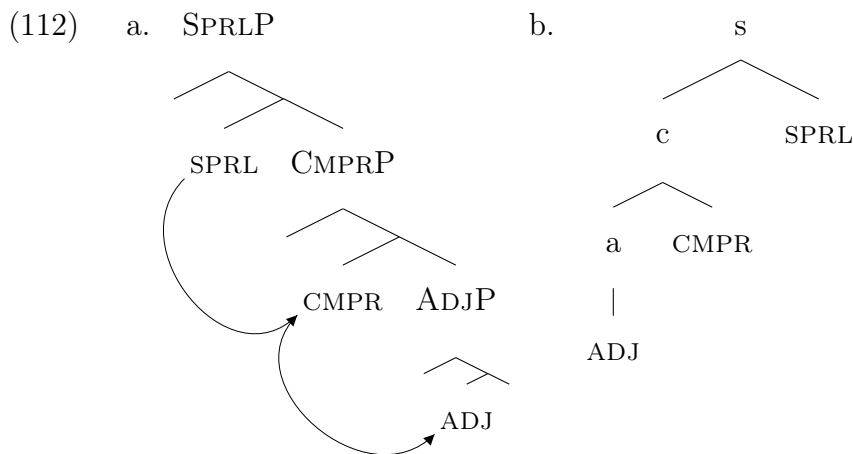
As noted above, morphological comparatives are modeled by application of Merger (or Head Movement), which combines the two heads, as in (92), repeated here as (110).



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:

- (111)
- | | | | |
|-------------|---------------|-----------------|--------|
| | POS | CMPR | |
| a. Romanian | mult | mai mult | ‘many’ |
| b. Albanian | i mirë | më mirë | ‘good’ |
| c. Turkish | iyi | daha iyi | ‘good’ |

Now, a morphological superlative, under the containment hypothesis, must be derived by successive operations of Merger, as in (112a), yielding the morphological object (112b). This is the basic structure of morphological superlatives underlying the theory presented in the previous chapter. The morphological output of this derivation (112b) corresponds to the forms with transparent morphological embedding as in (60). 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 (108), also lacks Merger whenever that structure is further embed-

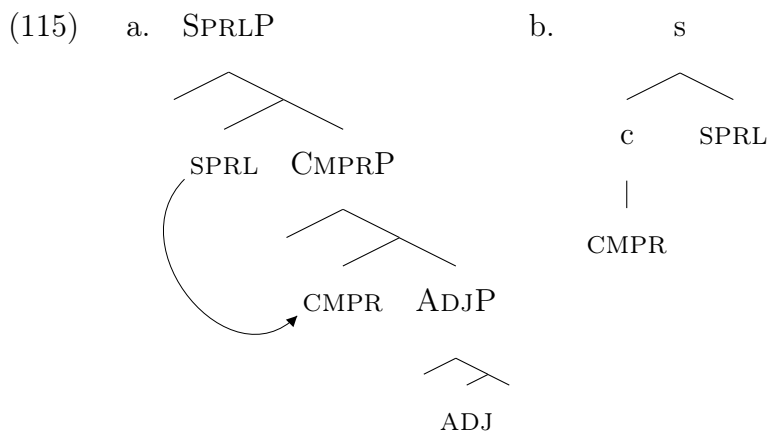
ded, as in (109). A further assumption is that Merger cannot skip intervening heads (this is part of the definition of Morphological Merger in Marantz 1989). Recall from above that an alternative to Merger for all of these structures is head movement in the syntax. Analogous considerations apply if head 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 Travis 1984 and much subsequent work).³⁴ Under these assumptions, a morphological superlative will only be possible when the operation that creates morphological comparatives is also possible. A language lacking (110) must also lack (112). As expected, languages with exclusively periphrastic comparatives have exclusively periphrastic superlatives:

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

Fully periphrastic constructions like that in Romanian, matching up to (109) 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):

- (114)
- | | POS | CMPR | SPRL | |
|--------------|----------------|---------------------|-------------------------------|-------------|
| a. French: | gros | plus gros | le plus gros | ‘big’ |
| b. Greek: | psil-ós | pjo psil-ós | o pjo psil-ós | ‘tall’ |
| c. Georgian: | lamaz-i | upro lamaz-i | q’vela-ze upro lamaz-i | ‘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 if the superlative attaches not to the adjective, but to the (otherwise free) comparative morpheme. The relevant derivation is given in (115a).



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 pre-

fix attaches directly to the comparative adjective, following the derivation in (112), but for periphrastic comparatives, the prefix attaches to the comparative adverb *bolj*, reflecting the derivation in (115). Illustrative examples of the two patterns are given in (116) (from Herrity 2000, 81-85):

(116)		‘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 *váḍā*), and the superlative may be formed from this by adding the emphatic particle *-ma*.³⁵

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

The derivation in (115) could also underlie periphrastic superlatives where there appears to be a superlative adverb or particle that combines directly 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 (115)). 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 (112). 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 (115)).

(118)		‘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 (109) 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 (119a-b), which form the superlative by means of a definite article or demonstrative. The pattern is also attested in some of the many languages in which the superlative is formed with a universal quantifier, as is possible in Veps (c) and Evenki (d), and in languages with a free-standing superlative marker, such as Ingush (e).³⁶ These examples may correspond to a derivation in which the superlative embeds the comparative, but only the lower step of

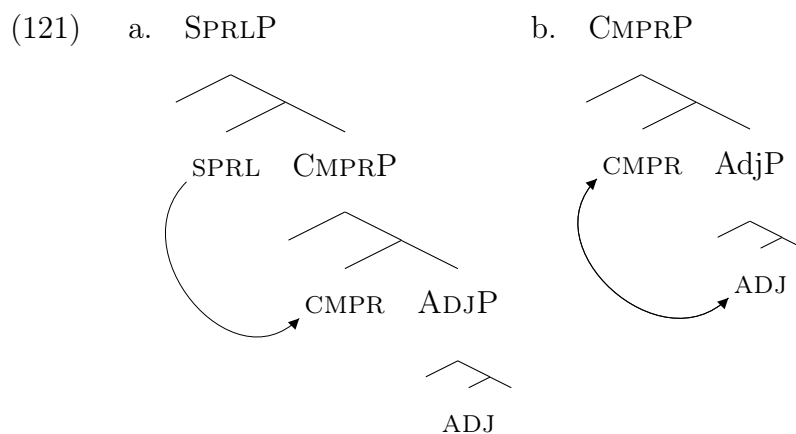
movement/merger applies.

(119)		POS	CMPR	SPRL	
	a. Greek	psil-ós	psiló-ter-os	o psiló-ter-os	‘tall’
	b. Livonian	vanā	vanī-m	se vanī-m	‘old’
	c. Veps:	čoma	čome-mb	keikiš čome-mb	‘beautiful’
	d. Evenki:	engesi	engesi-tmer	upkat-tuk engesi-tmer	‘strong’
	e. Ingush:	doaqqa	doaqqa-gh	eggara doaqqa-gh	‘big’

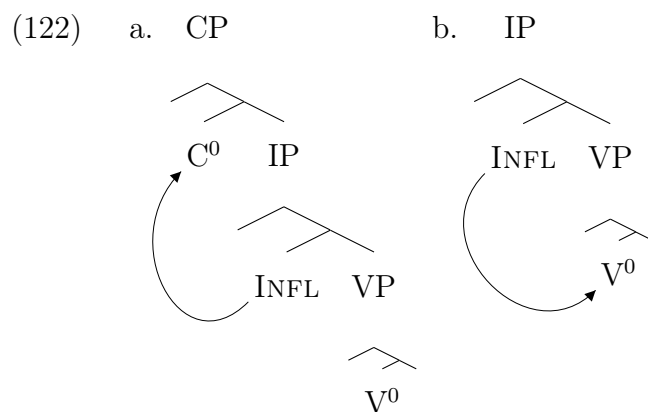
A final possibility, and perhaps the least obvious, is another type of situation in which comparatives are morphological, but superlatives are periphrastic (as in (119) above), but in which, unlike (119), the superlative does not embed the overt morphology of the comparative. This is the situation discussed above in reference to Tikhvin Karelian and Russian in (107c-d), bringing us back to the beginning of this chapter. Some examples of this pattern are given in (120). 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.³⁷

(120)		POS	CMPR	SPRL	
	a. Russian:	prost-oj	prošč-e	samyj prost-oj	‘simple’
	b. Ossetian:	bærzond	bærzond-dær	iuul bærzond	‘high’
	c. Udmurt:	kuž^j	kuž^j-ges	tuž kuž^j	‘long’
	d. Chuvash:	layăχ	layăχ-raχ	či layăχ	‘good’
	e. Arrente:	tjenja	tjenj-ulkura	tjenj’ 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 (115), repeated below as (121a).³⁸ These languages differ, though, from the pattern in (118) in that the comparative, when it does not combine with the superlative, combines with the adjective (as in (110) = (121b)), yielding a morphological comparative form. This paradigm is interesting, since it indicates that, while a language cannot have Merger in (110) 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 (115)) when the comparative subtree is embedded under a superlative. That was somewhat of a mouthful, and is schematized in (121):



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 and Bobaljik 2002a). In that analysis, English finite inflectional morphology originates in a functional projection (INFL⁰) above the verb. In inversion contexts, such as interrogatives, inflection raises to the C (COMP) position, spelled out as inflected *do*, and the verb is in situ in its bare form (as in (122a)). When there is no inversion, the inflectional morphology ‘lowers’ to the verb (by Morphological Merger, in Halle and Marantz 1993, Bobaljik 2002a), as in (122b):



Coming back to the comparatives, the proposed derivational pairing in (121) for languages with the pattern in (120) 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:

(123)	POS	CMPR	SPRL	
a. M. Greek	kak-ós	cheiró-ter-os	o cheiró-ter-os	‘bad’
b. Votic	üvä	parə-pi	kəikkia parə-pi	‘good’
c. Tv Karel.	hüvä	pare-mbi	{ülen/suamo} hüvä	‘good’
d. Russian	plox-oj	xuž-e	samyj plox-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 (110), embedded under a superlative, and the comparative head is local enough to the adjectival root that it governs suppletion. The derivation of (123c-d) by contrast is that in (121a). The comparative head, as in (115) is combined with the superlative, and thus is not in the same local domain as the adjective root and fails to govern suppletion.³⁹

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. Brief remarks on these other cases are provided after the discussion of Armenian. It should be kept in mind on the one hand that the SSG is independent 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.

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 (124) (see also (169b) in section 4.3).

(124) POS CMPR SPRL
 partsrahasag (aveli) **partsrahasag** amenen **partsrahasag** ‘tall’

However, there are also two options for superlative formation described in modern grammars as affixal. One is the 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, the putative ‘prefix’ *amen-a* bears the linking vowel characteristic of a compound structure. Evidently, compounds do not count as local morphological domains in terms of the ability of the non-head element to govern suppletion on the head (see also section 4.3). 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.

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 (125):⁴⁰

- (125) 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 aweli 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 (126):

- (126) a. qezme' mec' em
 you.SG.ABL big BE.1SG.PRES
 'I am bigger than you. (lit: 'I am big from you.')
- 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 (126) is a 'synthetic comparative' in the relevant sense, for example with a phonologically null, affixal, exponent of the comparative. If it is, then (126) has the structure in (91) 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 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 (126) at least since Ultan (1972, 127). The most thor-

oughly investigated of such languages is Japanese, which forms comparatives with no overt marking of the adjective (neither affixal nor periphrastic), as shown in (127).

- (127) 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). At center stage in the debate is not just the obvious morphological difference between Japanese and English, 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.⁴¹ For 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. For example, Armenian shows what Kennedy refers to as crisp judgments. 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 (128b) can be judged true even in a context where (128a) is judged false (for example, where both men are short). What makes this observation interesting is that the Armenian sentence in (128b) 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).

- (128) 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

makrer *aveli*.⁴²

- (129) 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*.⁴³

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. 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, and suggest instead that pursuing locality restrictions in compounds

(as suggested earlier) is the more promising alternative.

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.

3.4.2 SSG: Loose ends

I return here to a few remarks on some additional examples, beyond Armenian, for which available descriptions appear to suggest morphological superlatives in the absence of morphological comparatives. None of these seems particularly compelling, but I note them here for the sake of completeness.

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 (80). 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 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 (closely related) Alutor in Zhukova (1968b, 277) and Zhukova (1968a, 299), which give a zero-marked standard comparative construction for predicate adjectives, as in 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-čħən* ‘biggest’ among a list of intensified adjectival forms. But the longer description of Koryak in Zhukova (1972) gives the missing intermediate forms: the suffix *-čħən* forms comparatives, such as *əppulju-čħən* ‘smaller’ (root: *əppulju-* ‘small’) from which the superlatives are derived by the intensifying prefix *ənan-* (compare Chukchi in (60h). Thus in the Koryak case, the SSG violation is only an artefact of the brief description.⁴⁴

Note also in this context that throughout this work I have implicitly 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 (89a), 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 (89b). 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 questions 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*.)

A final loose end to be considered here is the following: 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* – *?*alerter*. Judgments are slippery here (see Arnold Zwicky’s discussion at: <http://languagelog.ldc.upenn.edu/n11/?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. For cases that truly involve relative superlatives, I suspect that the grammar of English permits both periphrastic and morphological forms for both superlative and comparative grades (thus *Merger* is optional for these adjectives, as for *politer/more polite* and *politest/most polite*), but variability in both attested distribution and relative acceptability judgments reflect gradient preferences (i.e., performance, rather than competence), at least in some cases phonologically driven (for example, avoiding the sequence of *-er*-final syllables in *?*alerter*).⁴⁵

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 of superlatives. 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.⁴⁶

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 ‘bigger 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).

$$(130) \quad \llbracket -est \rrbracket (R)(x)=1 \text{ iff } \forall y[y \neq x \rightarrow \max\{d:R(d)(x)=1\} > \max\{d:R(d)(y)=1\}]$$

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

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 x has the property R to a degree that is greater than the degree to which any other individual has that 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. The ‘greater than’ symbol in the lexical entry explicitly encodes comparison between (maximal) degrees. For reference, compare the meaning that Hackl (2000, 50) assigns to the comparative morpheme, given in (132). This element takes two (maximal) degree operators and compares them directly. The components of (132) are contained in the superlative in (130).

$$(132) \quad \llbracket -er \rrbracket(d)(d')=1 \text{ iff } \max(d) > \max(d')$$

By contrast, the formalism in (131) (mentioned in Hackl 2009, n.36 as a “more standard semantics for the superlative,” see also Gajewski 2010) achieves essentially the same meaning as (130), 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, the superlative in (131) does not formally contain (132).⁴⁷

So our first conclusion from the semantics is this: to the extent that a representation like (131) is logically possible, it does not follow from logical considerations alone that the superlative must contain an explicit compar-

ative element of meaning. The comparative sense may be achieved in an indirect manner, and the semantics alone thus does not force the Containment Hypothesis upon us.

The next observation about the semantics 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 \rightarrow hor- /] CMPR
 e. BAD \rightarrow špatn-

If we substitute (132) 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 se-

mantics for the excessive operator represented by English *too* (as in *too tall*, *too good*) is given in (133), and it too contains the 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).

$$(133) \quad \llbracket \textit{too} \rrbracket^w = \lambda P_{\langle s, dt \rangle}. \max(P(w)) > \max\{d: \exists w' \in \text{Acc}(w): P(w')(d)=1\}$$

The meaning of ‘too’ in (133) contains the comparative in the same way that the superlative in (130) does. But as noted above, in languages where the excessive or equative degree is affixal (illustrated by Czech in (50)) the excessive fails to trigger comparative stem allomorphs.⁴⁸ 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 and equative degree morphology does not typically embed comparative morphology, and languages may have a morphological excessive or absolute superlative without having a morphological comparative.⁴⁹ 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.⁵⁰

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 (47), repeated here, a configuration I have argued must be excluded.

(47) [[ADJECTIVE] 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 (130) might be seen as a 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 derivable.

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 thoroughly 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 are 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 construction, 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 (134) (for recent discussion of (134a) see, e.g., Den Dikken 2005 and references therein).

- (134) 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 (134a) crucially involves movement of the comparative degree operator, a process licensed by its quantificational nature. She contends that (134b) 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 (134) 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 obser-

vation that in comparative conditionals, an overt standard (*than*-clause) is disallowed:

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

For Beck, the impossibility of (135) 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 theory already suffices to explain the impossibility of superlative conditionals like (134b). The superlative cannot participate in this construction for exactly the same reason that an overt *than*-phrase is impossible (135). The quantificational nature of the (null) comparative is neither here nor there, and the pair in (134) 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 com-

parative is also a positive result for understanding (134) 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 (134a) from (134b) 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 (134b).

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.⁵¹

(136) 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.
- (137) Russian (Zh. Glushan, N. Radkevich, personal communication, 2010)
- a. i čem bolee povtorjal, 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 povtorjal, tem
 and what.INSTR SPRL-more repeated, that.INSTR
 nai-bolee ubeždal-sja.
 SPRL-more convinced-REFL
- (138) 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

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 (135), in the contribution of the superlative morpheme (i.e., the *-T* of *-ES-T*) 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 (135).

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, al-

though in Romanian, the superlative is transparently formed 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 far from conclusive.

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 containment 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 properties of (universal) 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 but a single problematic case), then adverbs, and finally, quantifiers (where three apparent problems lurk in paradigms for *many – more – most*). I have treated quantity-denoting modifiers (*many, much, few, etc.*) separately from property-denoting modifiers, since it is far from clear that the former are adjectives in all the languages considered. See section 1.3 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. Of the more than 300 languages considered, some 70 or so show comparative suppletion. From among these languages a total of 73 cognate triples are attested, listed here, grouped by (rough) gloss. For each triple, one example is given; the fourth column states the language the example is from, then lists other languages in which cognate triples are found. As discussed in sections 1.3 and 2.3.2, 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 cognate triple contributes only one data point even if it has reflexes in dozens of languages, (as in the case of the Germanic cognates to *good* – *better* – *best*). On the other hand, a single language may contribute multiple, overlapping triples in the case of suppletive doublets (as in the Georgian comparatives of ‘good’).

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, beyond the language families represented in the table, 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 here.

Table 4.1: Suppletive adjectival triples

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

Table 4.1: Suppletive adjectival triples

ADJ	CMPR	SPRL	LANGUAGE; COGNATES
agath-ós	ameín -ōn	(phér -ist-os)	Anc. Greek ⁴
agath-ós	areí -ōn	ár -ist-os	Anc. Greek
agath-ós	belt -íōn	bélt -ist-os	Anc. Greek
agath-ós	kreíss -ōn	krát -ist-os	Anc. Greek
agath-ós	ló -ion	lō -ist-os	Anc. Greek
pra-śásya-s	śré -yān	śré -ṣṭhas	Sanskrit
pra-śásya-s	jyā -yān	jyē -ṣṭhas	Sanskrit
śśāra-	has -tara	has -tama	Khotanese
xōb	weh / wah -īy	pahl -om/ pāš -om	Mid. Persian
xub	beh -tær	beh -tær-in	Persian
on	hobe	hobe -ren	Basque
on	hobe	on -en	Basque
hyvä	pare -mpi	parha -i-n	Finnish; other Fennic
š'ig'	per' a-mp	per' -mus	Kildin Saami
k'argi-i	u- mjob -es-i	sa-u- mjob -es-o	Georgian ⁵
k'argi-i	u- k'et -es-i	sa-u- k'et -es-o	Georgian
ezär	xo- č -a, xo- č -ēl	ma- č -ēne	Svan ⁶
osda	dajehla	wi- dajehl -āʔi	Cherokee

Table 4.1: Suppletive adjectival triples

ADJ	CMPR	SPRL	LANGUAGE; COGNATES
BAD			
bad	worse	wors-t	English
ubil	wirsi-ro	wirsi-sto	OH German; O English
vándr	ver-re	ver-str	O. Icelandic; other Scandinavian
íllr	ver-re	ver-str	O. Icelandic; other Scandinavian
slem	vær-re	vær-st	Danish
ringur	ver-ri	ver-st-ur	Faroese
dålig	vär-re	vär-st	Swedish; Norwegian
dålig	säm-re	säm-st	Swedish
šlext	erg-er	erg-st	Yiddish
zł-y	gor-szy	naj- gor-szy	Polish; other Slavic
špatn-ý	hor-ší	nej- hor-ší	Czech
pohan-yj	hir-šyj	naj- hir-šyj	Ukranian
drènn-y	hor-šy	naj- hor-šy	Belorussian
blah-i	hor-šy	naj- hor-šy	Belorussian
loš	gor-i	naj- gor-i	Serbo-Croatian
plox-oj	xuž-e	nai- xud-š-ij	Russian
malus	pēj-or	pe-ssimus	Latin
olc	messa	messa-m	Old Irish
drwg	gwaeth	gwaeth-af	Welsh

Table 4.1: Suppletive adjectival triples

ADJ	CMPR	SPRL	LANGUAGE; COGNATES
fall	gwash- (oc'h)	gwash- añ	Breton
kak-ós	cheír- ōn	cheír- ist-os	Anc. Greek ⁷
kak-ós	héssōn	hék- ist-os	Anc. Greek ⁸
BIG (GREAT)			
mikil-s	mai- za	mai- sts	Gothic; Old Germanic, Icelandic
velk-ý	vět- ší	nej- vět- ší	Czech; other Slavic
velyk-yj	bil' -šyj	naj- bil' -šyj	Ukranian
duż-y	więk- szy	naj- więk- szy	Polish
mawr	mwy	mwy- af	Welsh ⁹
wazurg	meh/mah- īy	mah- ist	Middle Persian ¹⁰
ḍzyəd	xo-š-a, xo-š-ēl	ma-š-ēne	Svan
SMALL			
leitils	minn- iza	minn- ists	Gothic; OH Ger, Scandinavian
lýtel	læssa	læ- st	O. English
små	mind- re	mind- st	Danish; Norwegian ¹¹
mali, malen	manji	naj- manji	Serbo-Croatian; oth. Slavic
parvus; paulum	min- or	min- imus	Latin
bach	llai	llei- af	Welsh; Old Irish

Table 4.1: Suppletive adjectival triples

ADJ	CMPR	SPRL	LANGUAGE; COGNATES
mikr-ós	meí -ōn	meĩ -st-os	Anc. Greek
mikr-ós	eláss -ōn	elach -ist-os	Anc. Greek
kōdag	keh	kas -išts ¹²	Middle Persian
OLD			
gamall	ell -re	ell -ztr	Old Icelandic; Scandinavian
NEAR			
agos	nes	nes -af	Welsh; Old Irish
STRONG			
cryf	trech	trech -af	Welsh

As is readily discerned, the overwhelming majority of the triples in Table 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 50 or so of the 73 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 (139):

(139)		POS	CMPR	SPRL	
	a.	Swedish: god	bätt-re	bä-st	‘good’
		(also):	god-are	god-ast	
	b.	French: mauvais	pire	le pire	‘bad’
		(also):	plus mauvais	le plus mauvais	
	c.	Georgian: k’argi-i	u- k’et-es-i	sa-u- k’et-es-o	‘good’
		(also):	u- mjob-es-i	sa-u- mjob-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 (139b) 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:

- (140) 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 suppletive 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 (141) from Seiler 1950, Chantraine 1967).

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

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 *phér-*. 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 to be grammatically regular, as in (142).

(142)	POS	CMPR	SPRL
a.	English: small	small-er	small-est
b.	English: little	little-r	little-st

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* ‘superior, higher’, *maggiore* ‘bigger’, 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.¹³ 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 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 (139c) 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 (141) I have counted three ABB triples, and combined (perhaps unwisely) the two defective triples into a single ABC count.¹⁴ Furthermore as discussed above, 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 (53)). 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 (143), see Trask (1997, 100), Trask (2003, 140) (the *-(r)en* suffix is the regular superlative suffix). De Rijk (2008, 721) attributes the regular *on-en* form (and related adverbial forms) to southern usage, with the triple in (143a) characterizing northern usage or elevated style.

- (143) 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.¹⁵ 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 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 misnomer, 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 adnominal modifier functions,

including, but not limited to, 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:

- (144) 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 (145) 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).’

- (145) 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 three unrelated languages are given here (note that the literal paraphrases are not ‘the best of the best’, as in English, but rather more like ‘bigger than big’):

- (146) 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. tedi-leš no tedi
 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:

- (147) 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 (146), the ‘standard’-marking adjective may take the genitive or possessive form. In Tyvan, for example, alongside (146a) with the ablative, the adjective is marked genitive when the head adjective is substantivized:

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

Examples such as (148) provide a potential source for a genitive or possessive marked adjective to become conventionalized as a superlative. Ellipsis of the head (deadjectival) noun in (148) 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 (143) 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.¹⁶ Thurneysen (1909, 226) gives the following suppletive paradigms (with some further variations in the forms for ‘smaller, smallest’, not relevant here):

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

The last three of these are unproblematic, but (149a) 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 ad-

jectives’, 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 it 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 (morpho-)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 (149) is thus an artefact of the presentation, in particular, the conflation of two distinct morpho-syntactic constructions or environments.

In sum, of the 73 distinct adjectival cognate triples in 72 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 suspect that this may fall to an alternative analysis.

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 (150).

(150)		POS	CMPR	SPRL	
	a. English	ADJ: bad	worse	wor-st	
		ADV: bad-ly	worse	wor-st	
	b. Czech	ADJ: dobř-ý	lep-ší	nej- lep-ší	‘good’
		ADV: dobř-e	lep-e	nej- lep-e	‘well’
	c. French	ADJ: bon	meilleur	le meilleur	‘good’
		ADV: bien	mieux	le mieux	‘well’
	d. Karelian	ADJ: hyvä	pare-mpi		‘good’
		ADV: hyv-in	pare-mm-in		‘well’
	e. Georgian	ADJ: cud-i	u- ar-es-i		‘bad’
		ADV: cud-ad	u- ar-es-ad		‘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*), the suppletive adverbial form of *good*; some others are given in (151):¹⁷

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

I will argue here that at least some of these, in particular English (151a), should not count as true ABB patterns in the sense relative to the CSG, though others, such as those in (151b-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 (152), with A-ROOT intended to cover both adjectives and adverbs) holds of adverbs, as well as adjectives.

(152) [[A-ROOT] COMPARATIVE]

There is reason to be suspicious of this. 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 a comparative adverb like *better* appears to function as the comparative of *well*, its actual derivation may be more circuitous, at least 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 (153):

(153)		POS		CMPR
	ADJ	rutto	→	rutto-mpa-
		↓		↓
	ADV	rutto-h		rutto-mpa-h

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).¹⁸ In these languages, where an adjective takes a suppletive comparative, that suppletion is ‘inherited’ by the adverb (cf. (150)):¹⁹

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

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

(155) [[[GOOD] CMPR] ADV]

The vocabulary fragment with the exponents of English GOOD may be as in (156).

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

Note that (156a) and (156b) are not ordered by the Elsewhere Condition. However, there are a number of reasons why (156b) should bleed (156a) in (155), explaining why the pattern is *well – better* rather than **well – weller*. In Chapter 5, I explore the possibility that the contexts for root allomorphy can only make reference to adjacent morphemes (cf. Embick 2010), which would force this ordering (though note that there are various empirical problems with a strong adjacency condition, including one mentioned just below). Even without a strong adjacency condition, an intervention condition of the familiar type would also be applicable here: the comparative is closer to the root in (155) than the adverbial marker, and thus (156b) takes priority over (156a). Either way, considerations of structural locality, rather than the Elsewhere Condition per se, will serve to determine the correct application of the rules in cases of this sort.

It should be noted that the derivation in (153) 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.

(157)		POS		CMPR	
	ADJ	berri	→	berri-ago	‘new, fresh; adv = recently’
		↓			
	ADV	berri-ki	→	berri-ki-ago	

Thus the morpheme order evidence (from this small sample)²⁰ points to the structural variation in (158):²¹

(158)	a. Karelian, Georgian, English?	[[[ADJECTIVE] COMPARATIVE] ADVERB]
	b. Basque	[[[ADJECTIVE] ADVERB] COMPARATIVE]

Because the morpheme order in Basque is the reverse of what is seen in Karelian and Georgian, the logic that excluded **well-er* in (156) (given (158a)), 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. Standard Basque has one suppletive adverbial: the adverb corresponding to adjective *txar* ‘bad’ is *gaiz-ki*, rather than *txar-ki* (de Rijk 2008, 236).²² And unlike Karelian, Georgian and English, the adverbial suppletion is preserved in the adverbial comparative, a difference we may attribute to the different derivational histories in (158):

(159)		POS		CMPR	
	ADJ	txar	→	txar-ago	‘bad’
		↓			
	ADV	gaiz-ki	→	gaiz-ki-ago	

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 investigating portmanteau morphology in Chapter 5, I will suggest a reason why this might be significant.

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.

Returning to the CSG, 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’.²³ 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* 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 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, which can perhaps be appreciated more clearly in light of the discussion of (156). In the presentation thus far, I have (tacitly) 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 Vocabulary fragment in (162). This incorrectly admits **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 that learners do not posit contextual allomorphs that are accidentally homophonous with the default exponent of a given morpheme (see (44)). That assumption 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 thus the Antihomophony bias in (44) from Chapter 2 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. The few patterns that are not extensions of adjectival patterns are consistent with the CSG (despite Ultan’s claim to the contrary, see note 23), 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 39 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 also 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

ADJ	CMPR	SPRL	LANGUAGE; COGNATES
MANY, MUCH			
many	mo-re	mo-st	English; Scandinavian
much	mo-re	mo-st	English; Scandinavian ²⁴
(a) lot	mo-re	mo-st	English ²⁵
viel	me-hr	mei-st	German; other Germanic
nógv-ur	mei-ri	me-st-ur	Faroese
party	me-er	mee-ste	Afrikaans
baie	me-er	mee-ste	Afrikaans
sakh	me-r	me-r-ste	Yiddish
mange	fle-re	fle-st	Danish; Scandinavian
mnoho	víc-e	nej- víc-e	Czech; Serbo-Croatian
mnogo	bol’š-e	naj- bo’lš-ij	Russian

Table 4.2: Suppletive quantifier triples

ADJ	CMPR	SPRL	LANGUAGE; COGNATES
mnogo	po- več -e	naj- mnogo	
wiele	więc -ej	naj- więc -ej	Polish
puno	već -e	naj- već -e	Serbo-Croatian
baháto	bil' -šyj	naj- bil' -šyj	Ukranian
dúže	bil' -šyj	naj- bil' -šyj	Ukranian
daudz	vair -âk	vis- vair -âk	Latvian
mult-	plū -s	plūr -imu-s	Latin
kalz	mui -(oc'h)	mui -añ	Breton
llawer	mwy	mwy -af	Welsh
pol-ús	ple -íōn	ple -ĩst-os	Anc. Greek
šat-erë	aveli	amena-šat	Armenian
xele	beš -(tar)	beš -tar-in	Persian
ziad	beš -(tar)	beš -tar-in	Persian
asko	gehi -ago	gehi -en ²⁶	Basque
monet	usea -mmat	use -i-mmat	Finnish
paljon	ene -mmän	en -iten	Finnish
äijä	enä -mpi	äij -in	Karelian
sok	tö-bb	leg- tö -bb	Hungarian
bevri	met' -i	u- met' -es-i ²⁷	Georgian
kwad, ba	nax	nax -deda	Kabardian

Table 4.2: Suppletive quantifier triples

ADJ	CMPR	SPRL	LANGUAGE; COGNATES
FEW			
(a) little	less	leas-t	English
weinig	minder	mind-ste	Afrikaans; Dutch
(en) bytsje	minder	minst	Frisian
troxi	men-še	naj- men-šij	Ukrainian, Slovenian
paucus	min-or	min-imus	Latin
olíg-os	hḗss-ōn	hḗk-ist-os	Anc. Greek
olíg-os	meí-ōn	meĩ-st-os	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) *Many-more* examples:

	POS	CMPR
a. Manx:	ram	smoo
b. French:	beaucoup	plus
c. Spanish:	mult-o	más
d. Mod. Greek:	pol-ís	perissó-ter-os

e. Ossetian:	biræ	fil-dær
f. Veps:	ei	ena-mba
g. Abkhaz:	šarda	ajha
h. Tatar:	küp	artıq
i. Hindi:	kai	zyaadaa ²⁸

Note the inclusion of Abkhaz (N. W. Caucasian) and Tatar (Turkic) in this list, which, along with Kabardian (also N. W. Caucasian) in Table (4.2), are examples of suppletion outside (although not all that far outside) the Greater European Sprachbund 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-rək*, (Burganova et al. 1969, 173). Similarly in (unrelated) Lezgian, Haspelmath (1993, 433) gives an example with *artux* having the meaning ‘more’ (greater in quantity), but notes 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 39 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):

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

Starting with Bulgarian-Macedonian, it appears that the source of the problem lies in the classification of these examples as morphological (synthetic) comparative and superlative constructions. But 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. Superlative *naj* (and the comparative *po-*) are not prefixes, but rather clitics or free-standing adverbs, which do not form a minimal morphological unit with the adjectival root. Since the CSG ranges over morphological, but not periphrastic, comparatives (see Chapter 3), these examples are not counter-examples if they are not synthetic constructions. Evidence that there is more structure in these was mentioned already in note 21: the superlative and comparative markers in Bulgarian and

Macedonian attach not only to adjectives, but also to phrases of a variety of sizes. Macedonian examples are given here (Friedman 2002, 22):

- | | | | | | | | |
|-------|----|-----|----------------|----|-------------|--------------------|-----|
| (166) | a. | na | jug | b. | po | na | jug |
| | | | to/in south | | CMPR | to/in south | |
| | | | ‘to the south’ | | | ‘more southerly’ | |
| (167) | a. | ne | saka | b. | naj-ne-saka | | |
| | | NEG | like | | SPRL-NEG | like | |
| | | | ‘dislike’ | | | ‘dislike the most’ | |

Orthographic conventions dictate that the comparative and superlative markers are sometimes written together with the phrase they modify and sometimes not. Thus, (167b) is written as a single word, but when an object clitic occurs between the negation and the verb, then the superlative (as well as the other clitics) are written as separate words: *naj ne go saka* ‘SPRL NEG 3SG.OBJ like’ = ‘he dislikes him the most’ (Friedman 2002, 22). Authors also note that the comparative and superlative constitute an independent prosodic domain, having their own stress, independent of that of the stem (even when written together) (Alexander 2000, 198). Compare also Lunt (1952, 52): “*Po* and *naj*, although they ... are considered so much an integral part of [the word that they modify] that they are written as prefixes, still are really adverbs.”²⁹

As analytic (periphrastic) constructions, the Bulgarian and Macedonian superlatives pattern with periphrastic superlatives in Tikhvin Karelian and Russian (and Armenian compounds, considered below), which do not inherit

the suppletive root of the comparative (see chapter 3; see also (173c) from Ludian Karelian):

(168)	POS	CMPR	SPRL	
a. Bulgarian:	mnogo	po- veče	naj mnogo	‘many’
c. Tv Karel.	hüvä	pare -mbi	{ülen/suamo} hüvä	‘good’
c. Russian	plox-oj	xuž -e	samyj plox-oj	‘bad’

Although understanding the Bulgarian-Macedonian superlative as a periphrastic, rather than a morphological, construction gets us out of the woods as far as the CSG is concerned, the considerations just raised do not render the Bulgarian data un-problematic. Rather, the nature of the problem is shifted, and it is the suppletion in the comparative that becomes an issue. Bulgarian now looks like a possible counter-example to the claim that suppletion is restricted to morphological domains, and that periphrastic constructions cannot be suppletive. I postpone discussion of this issue to the end of this section, and offer a tentative solution to the Bulgarian-Macedonian question there.

Turning now to Armenian, we find that the morphological ‘wordhood’ of the offending example is once again in question. 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 (169)) 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 3.2.3). For ‘most’, the corresponding form is: *amenen šat* ‘all-ABL-DEF many.’

- (169) 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 (169a) 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, (169a) has the same structure as (169b), 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, an ABB paradigm (a shared root with the comparative, and the superlative suffix *-in*), as in (170).

(170) POS CMPR SPRL
 Karelian: **äijy** **enä-mbi** **en-in**

The pattern in (170), 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).³⁰ 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 (171).

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

The translations offered for (171a) and (171b) conformed to the suppletive comparative paradigm expected. Representative examples are given in (172) (glosses are constructed on the basis of information in Zajkov (1999); there was some variation not relevant to the point made here.)

- (172) 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
 Pavel-ADESS is more-CMPR dog-PART than Peka-ADESS
 ‘Pavel has more dogs than Pekka.’

For the superlative, none of the respondents gave the problematic form in (165a), nor did any recognize it when asked.³¹ Four of the seven speakers gave *enin* as the superlative of ‘many’, as in (173a). Other possibilities offered were *kaiki-s enä-mpi* ‘more than all’ (173b) and a periphrastic superlative, with intensifier *ylen* ‘very’ combining with the positive root, as in (173c).

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

The strategy in (173b), 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).³²

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 of interference, acknowledging, of course, that they cannot be conclusively dismissed at this time. Thus, while questions remain, the Karelian, Armenian, and Bulgarian-Macedonian patterns do not appear, at this time, to constitute insurmountable problems for maintaining that the CSG is indeed an absolute linguistic universal as far as affixal superlatives are concerned.

4.3.2 Coda: Bulgarian, Macedonian and the RSG

Before moving on, let us return briefly to Bulgarian and Macedonian words for ‘many’, addressed above as a *prima facie* problem for the CSG. The examples are given here.

- | | | | |
|-------|----------------|--------------|-----------------------------------|
| (174) | POS | CMPR | SPRL |
| | a. Bulgarian: | mnogo | po- veče naj- mnogo |
| | b. Macedonian: | mnogu | po- veke naj- mnogu |

Above, 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 (174).

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 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:

- (175) 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:

- (176) *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 *po-* has in all other Slavic languages) thus permits the solution to Bulgarian-Macedonian offered in the previous section 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 it. 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.

4.3.3 Afterthought: 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 basic 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:

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

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’:

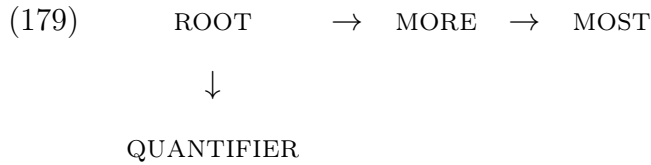
(178)		POS	CMPR
	a. Romanian	mult	mai mult
	b. Albanian	i shumë	më shumë
	c. Turkish	çok	daha çok
	d. Mordvin	lama	sjada lama

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

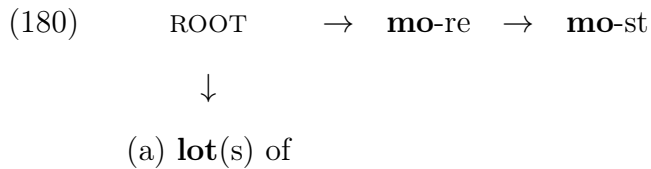
comparatives (as in: *more intelligent*, *more interesting*) and cannot be used to stand on their own as the comparative of ‘many’.

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 (179), modeled after the adverbial derivations in (153).³³



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* (180a). Yet these expressions on the face of it have some additional (apparently nominal) structure, and thus seem to reflect a pattern like (179):



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 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 (179), 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 in theory consistent with (44) 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 (179) 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 (156). 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.

4.3.4 Chapter summary

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 (perhaps including accidental homophony, see discussion of (44)). 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.

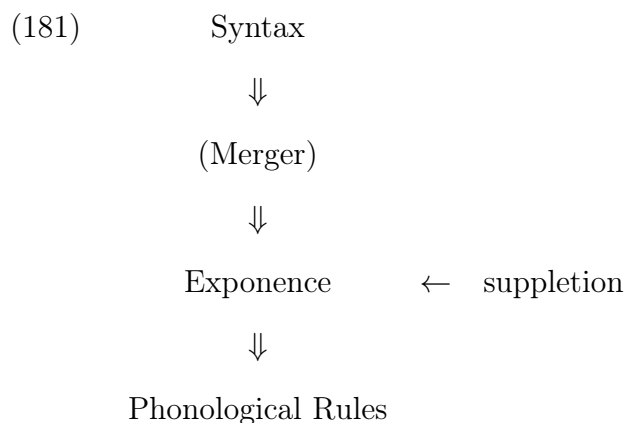
Chapter 5

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 (181), 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 Condition, 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.

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

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

(59) 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 (one part of) the CSG, discussed at length in the preceding chapters (we will

turn presently to the second part, the CSG2).

(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).

In Chapter 3, I added the assumption that the theory of morphology includes a locality restriction on possible contexts for suppletion. As a working hypothesis, I suggested that locality prevents a node β from serving as the context for allomorphy of a node α if a maximal projection (or other designated intervenor, see Embick 2010) intervenes between them, as in (90), repeated here:

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

The assumption in (90) derives the RSG in (88), and also anchors the account (together with some ancillary assumptions) of the SSG in (89).

(88) The Root Suppletion Generalization (RSG)

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

(89) 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 (and other realizational frameworks). 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 ((183) versus (184)).

- (183) a. Leo goes swimming on Sundays.
b. Leo went swimming on Sunday.

- (184) 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:

- (185) a. GO → wen- / ___] PAST
b. GO → go

On this assumption, the analysis parallels that of (182) – the suppletive allomorph is selected when the conditioning feature is an affix (185a), but not when the conditioning feature is expressed periphrastically, with a word boundary intervening.

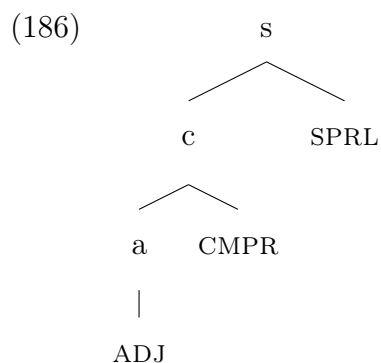
The Containment Hypothesis is, of course, specific to comparatives and superlatives, by definition, and I have devoted a significant part of Chapter 3 to arguing that it is robustly supported, independently of the CSG.

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 (181), 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) and Embick (2010). Consider this with reference to a concrete structure,

namely (186), 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,SPRL) is knowable, and (at least the adjacent node, see below) may thus condition allomorphy, as in (182a), 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 (186).¹

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 Halle and Marantz 1993 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 determining 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 for suppletive derivations. The Classical Greek examples in (187) serve to illustrate this difference. The triples for ‘good’ and ‘few’ are suppletive, and constitute ABB patterns (for other forms for ‘better, best’ see (141)), but in the triples for ‘big’ and ‘swift’, if one looks only at the surface forms of the root, the comparative constitutes the odd one out.

(187)	POS	CMPR	SPRL	
a. Anc. Greek:	agath-ós	belt-íōn	bélt-ist-os	‘good’
b. Anc. Greek:	olíg-os	eláss-ōn	elách-ist-os	‘few’
c. Anc. Greek	meg-as	meiz-ōn	meg-ist-os	‘big’
d. Anc. Greek	tach-us	thass-ōn	tach-ist-os	‘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.² As far as the rules of exponence (and thus the CSG) are concerned, the phonologically irregular patterns in (187c-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.³ But no such limitation is imposed on phonological (including readjust-

ment) 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 < *-isimmos*), 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 (187c-d)), irregulars are therefore also expected to show ABB patterns whenever both the superlative and the comparative meet the environment for some rule. For example, palatalization of 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, as the following Serbo-Croatian examples illustrate:

(188)	POS	CMPR	SPRL	
a.	duɡ	duž-i	na.j- duž-i	‘long’
b.	brz	brž-i	na.j- brž-i	‘fast’
c.	mlad	mladž-i	na.j- mladž-i	‘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:

(189)	POS	CMPR	SPRL	
a.	hart	härt-er	(am) härt-est-en	‘hard’
b.	zart	zart-er	(am) zart-est-en	‘tender’
c.	schwach	schwäch-er	(am) schwäch-st-en	‘weak’
d.	wach	wach-er	(am) wach-st-en	‘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).⁴ I 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, a more difficult case, which I leave unresolved for now, is the variety of Surmiran (Rumantsch) discussed in Anderson (2008).⁵

5.3 Adjacency, ABC, *AAB

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 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 (190a) (= (45a)) as a possible context for root suppletion in (186) since the comparative intervenes.⁶

- (190) 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:

(191)		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>

I left open in Chapter 2 what the formulation of adjacency would need to be so as to exclude *AAB without incorrectly excluding the attested ABC patterns such as in Latin and Welsh. Some examples from Chapter 2 are repeated here:

(192)		POS	CMPR	SPRL	
	a. Latin:	bon-us	mel-ior	opt-imus	‘good’
	b. Welsh:	da	gwell	gor-au	‘good’
	c. Old Irish:	maith	ferr	dech	‘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 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 (193) corresponding to the Welsh example in (192b) (cf. Latin (41) from Chapter 2).

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

The challenge here is to ensure that whatever formalism is used in (193a), allowing the superlative root allomorph to bleed the comparative, is unavailable in cases like (190a), which would falsely admit AAB patterns. In other words, in order to derive the CSG2, what we need to ensure is that the presence of a suppletive allomorph in the superlative (as in (193a)) for a given root ensures that the same root also has a suppletive comparative allomorph (193b). In the following paragraphs, I suggest two approaches to deriving this generalization, one drawing in part on ideas about the treatment of portmanteau morphemes in Radkevich (2010), and the other a return to early

notions of the cycle, and of domain extension. I leave deciding among these alternatives as a project for future work.

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 (190a) and thus that the clunky statement of the context in (193a), 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 affix. 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, simultaneously.

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 now time to revisit the *worse* case.

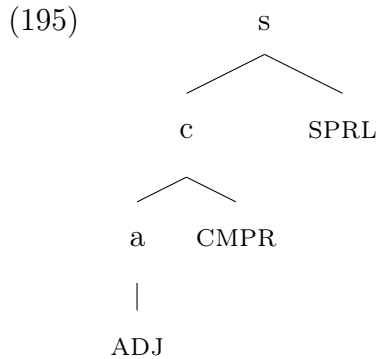
The toolbox of Distributed Morphology contains an alternative means of characterizing *worse*-type portmanteau suppletion. Specifically, rather than posit that *worse* is the spell-out of the adjective root BAD alone, *worse* may spell out both root BAD and the feature CMPR simultaneously, as in (243):

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

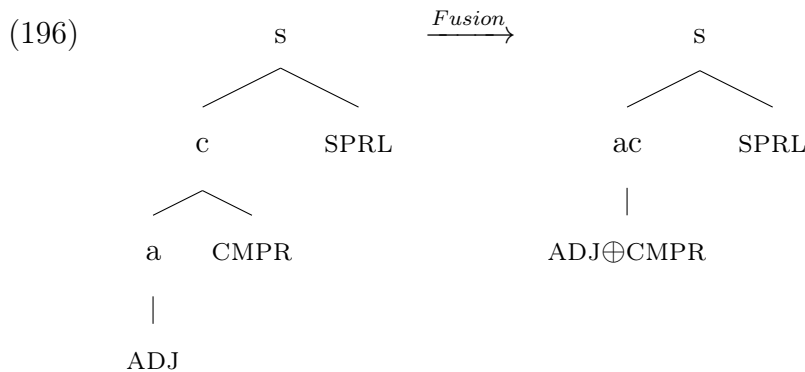
Compare the representation of (194a) to (182a), repeated here:

- (182) a. GOOD → bett- / ___ | CMPR
 b. GOOD → good

The suppletive allomorphs in (194a) and (182a) differ 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 (194a), unlike that in (182a), may serve as the spell out of the node *c* in (195) (= (186)) directly, with no appeal to a zero comparative allomorph (as in (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 (195) is schematized in (196); the fused node is a single locus of vocabulary insertion, to which the rule of exponence in (194a) may apply.



An alternative formalism proposed by Radkevich (2010) is to admit insertion directly at non-terminal X^0 nodes (see also Neeleman and Szendrői 2007 and Caha 2009), i.e., inserting the exponent *worse* directly at node *c* in

(195) 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 (197):⁷

(197) 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.⁸ (Radkevich 2010, 8)

For current purposes, the Fusion and VIP proposals are equivalent.⁹ 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 (193a), and replacing it instead with the clearly adjacency-satisfying allomorphy in (198a).

- (198) 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 requires ABC patterns to involve portmanteau exponence of $\sqrt{\text{ROOT}} + \text{CMPR}$ in the superlative, since it is only the node dominating both of these that is adjacent

to the SPRL node. A Vocabulary fragment like (193) is impossible, and must be represented instead as in (198). As noted above, the consequence that ABC patterns must involve portmanteau suppletion for the comparative contained in the superlative grade is consistent with all the known ABC cases.¹⁰

The ramifications of this approach to portmanteau suppletion extend well beyond grades of comparison, and the approach yields the general prediction in (199):

- (199) 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 adjacent to (or contiguous with) $\sqrt{\text{ROOT}}$.

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 any non-portmanteau root $\sqrt{\text{ROOT}_2}$, $\sqrt{\text{ROOT}_2}$ 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 in 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 (200):

- (200) [[[[ROOT] ASPECT] TENSE] MOOD]

Portmanteau expression of $\sqrt{\text{ROOT}} + \text{ASPECT}$ is admitted by the theory, and well attested. By (199), portmanteau expression of $\sqrt{\text{ROOT}} + \text{TENSE}$ should be disallowed in the general case, but it *is* allowed if either (i) there are no aspect morphemes in the domain (or language) 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 (200). Radkevich reports that this is indeed the case in Veselinova's survey (and likewise for portmanteaus that include mood).¹¹

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.¹² 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 and 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 to have a Welsh-like system, but with only two root allomorphs for GOOD, as in (201):

- (201) a. GOOD, CMPR → gor- / ___] SPRL]
 b. GOOD → da

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

- (202) If there is a context-sensitive rule of exponence involving a node α , then there is a context-free rule of exponence involving α .

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 (203a) (= (182a)) is permissible, just in case there is also a context-free form (203b).¹³

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

The motivation for (202) may lie in the process of acquisition, in essence, allowing for the acquisition of a contextually restricted allomorph of some morpheme α only after α 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).¹⁴

The pair of exponents (198a) and (198b) constitute context-sensitive and context-free allomorphs, competing for the expression of a single node, node c in (195). This pair of rules is thus permitted under (202). Now consider the relation between (198b) and (198c), which is exactly parallel to that between

worse and *bad* in (194), repeated here. The condition in (202) is intended to cover (194) in the same way it covers (203).

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

To ensure that this pair satisfies (202), we must understand (194a) to count as a context-sensitive counterpart to (194b). Rule (194b) applies to (thus involves) node *a* [$\sqrt{\text{BAD}}$] directly, while the portmanteau rule (194a) affects (and thus involves) that same node, but only in a context-sensitive manner, namely, only when *a* is contained in the CMPR node. Understood in this way, (202) thus permits (198) (and (194)). By contrast (201), which would derive an AAB pattern (**da - da-ch - gor-au*), is excluded by (202). Rule (201a) provides a context-sensitive exponent for the node [GOOD, CMPR] (node *c* above), but there is no corresponding context-free rule involving that node [GOOD, CMPR] (even though there are entries for its components).

The markedness condition in (202), when coupled to the VIP treatment of portmanteaus, and an adjacency condition on allomorphy, 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 (198b), requiring instead (204).

- (204) a. GOOD, CMPR → opt- /] SPRL]
 b. GOOD → mel- /] CMPR]
 c. GOOD → bon

Here again, (202) makes the right cut. The pair of rules in (204b-c) is exactly parallel to (203) discussed above. In turn, the pair in (204a-b) both involve the node *c* dominating the adjective root and the comparative, with only the rule in (204a) sensitive to an additional context beyond that node.¹⁵

In sum, combining the treatment of portmanteaus via Fusion or Radke-
 vich’s VIP with the assumption in (202) 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.¹⁶

5.3.2 Aside: A cyclic alternative?

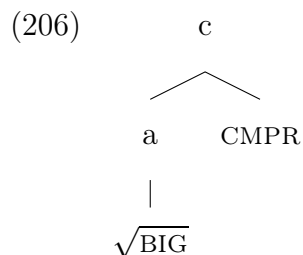
Before moving on, I make a brief digression here to put on the table a possible
 alternative to (202), invoking cyclicity (domains), rather than markedness to
 ensure the transitivity effect in (198) and (204).¹⁷ Recall that the key work
 that (202) does is to ensure that the existence of a suppletive allomorph in
 the superlative for a given root (as in (204a)) entails that the same root also
 has a suppletive comparative allomorph (204b), excluding the **good – gooder*
 – *best* (*AAB) pattern, while permitting the ABC one.

Conceivably, the same work could be done without (202) in a theory
 which incorporates some version of the Strict Cycle Condition and/or a Phase

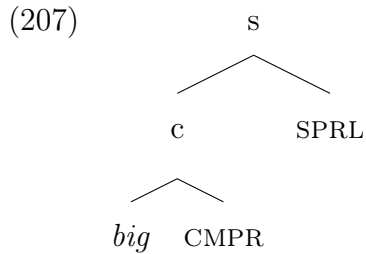
Impenetrability Condition (Chomsky 2001), along with a condition that suspends the effects of the latter in particular instances. Consider, for example, a cyclic theory that incorporates the following assumptions (cf. Embick 2010):

- (205) a. A cyclic node triggers “spell-out” of its complement, where spell-out includes rules of exponence.
 b. A node that has been “spelled-out” is inaccessible to further application of rules of exponence.

If we assume that CMPR and SPRL are designated as cyclic nodes, then the first step to consider in the derivation of a non-suppletive superlative like *biggest* is that in (206):¹⁸



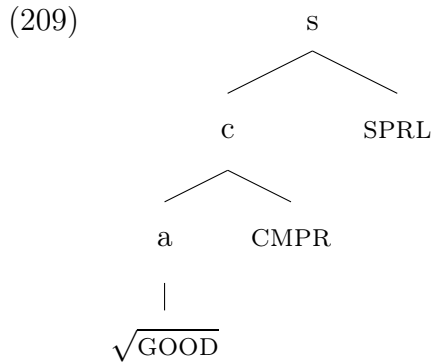
At this point, by (205a), the adjective root will be subject to exponence; for example, the node *a* could be spelled out as *big*. The next cycle would then be as in (207). Note that the innermost node has been spelled out, and, by (205b), is thus impervious to further rules of exponence. In particular, the (structural) adjacency condition on allomorphy is here cast as a by-product of cyclic derivation—when rules of exponence apply to the root, the SPRL node is not visible; and when the SPRL node is introduced, the chance to affect exponence of the root has passed.



Now, imagine adding to (205) a qualification as follows:

- (208) a. Spell-out of a domain D under (205a) is suspended, if a rule of exponence *spans* D.
- b. A rule *spans* D if it involves X,Y in the configuration: $[[X]_D Y]_{D+1}$

This qualification has no effect on the spell out of a non-suppletive adjectival root in (206), but in the case of a suppletive root, such as $\sqrt{\text{GOOD}}$ (with suppletive allomorph *bett-* / $__\text{CMPR}$), the qualification in (208) blocks spell-out of node *a* on the first cycle. Spell-out is delayed until the next higher cycle. While a regular adjectival root is thus frozen by the time the superlative is introduced (205b), a root with a comparative allomorph will remain ‘active’ at the outer cycle, and spell out of the root (or more correctly the node *c* containing the root) could potentially be affected by the superlative:



In this way, the *Domain Suspension* proposal in (208) appears able to capture the transitivity effect that distinguishes between *AAB and ABC patterns. The SPRL node is only accessible to the root (and thus can only participate in conditioning root allomorphy) if spell-out of the root on the first cycle is suspended, effectively expanding the spell-out domain that contains the root to node *c*. Crucially, it is the existence of a comparative allomorph for the root that triggers this domain extension; for this approach to have the desired effect, (208) must be defined in such a way that a rule like (201a) does not trigger Domain Suspension, either because it does not apply to node *a* as such, or because it cannot be considered on the first cycle as the SPRL in the contextual restriction is too remote.

One reason to entertain a Domain Suspension approach, in place of (202) is the potential for convergence across theoretical domains. The current syntactic literature contains a variety of suggestions to the effect that cyclic domains (phases) are in some sense dynamically defined (Bobaljik and Wurmbbrand 2005, Bošković 2010). In some proposals, such as Den Dikken's (2007) *Phase Extension* (and other related suggestions, with antecedents including

Baker 1988), Head-Movement plays the role of spanning in (208b) expanding cyclic domains; while in others, such as Wurmbrand (2011a), closer to the present proposal, it is the requirement of feature dependencies to span a domain boundary that suspends the domain effects (see also Despić 2011 and Takahashi 2011 for related proposals). It is not trivial however, at this juncture, to show that Domain Suspension provides a fully viable alternative to (202), and I leave the matter open.

5.3.3 Adjacency - Outstanding Issues

The previous aside notwithstanding, an adjacency condition on suppletion is 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, as mentioned above, 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.¹⁹

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:

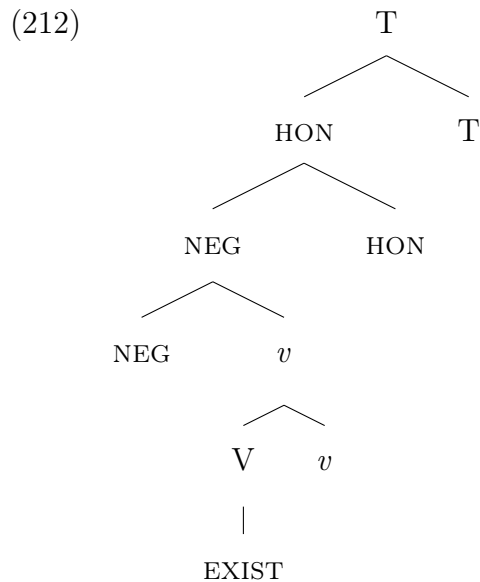
- (210) a. eysute-ka ttek-ul mek-ess-ta.
 Esther-NOM rice cake-ACC eat-PST-DCL
 ‘Esther ate rice cake (non-honorific).’
- b. apeci-kkeyse ttek-ul capswu-*(si)-ess-ta.
 father-HON.NOM rice cake-ACC eat.HON-HON-PST-DCL
 ‘Father ate rice cake (honorific).’

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:

- (211) 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 (silent) *v* head, Chung argues that the structure of the Korean verb is as in (212):



In this structure, the suppletion in (211a) thus takes place in a context of structural non-adjacency. Admitting a parallel analysis in the realm of

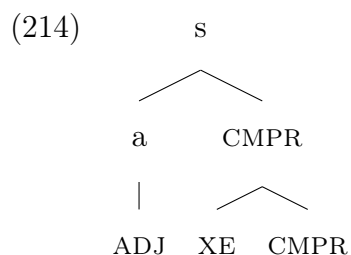
superlatives would open the door to unattested AAB patterns, which could be characterized as (190a). Despite the elegance of Chung’s solution, it is conceivable that the alternations characterized as honorific suppletion are not instances of grammatical suppletion as such, but are rather lexical, with 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.²⁰ I will thus, tentatively, put this example aside.

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 (213) 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).

- | | | |
|-------|-------------|-------------|
| (213) | ‘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 (214):



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 (213c) 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, thus:

- (215)
- a. GOOD → hobe /] CMPR]
 - b. GOOD → on
 - c. CMPR → Ø / hobe]
 - d. CMPR → -ago

Now, it should be clear why the zero comparative (215c) is selected in (213b). But why does *-ago* show the distribution that it does, surfacing in (213c), rather than the zero comparative being inserted at the higher CMPR node in (214)? Even if insertion at non-terminal X⁰ nodes is possible, as entertained above, the VIP (197) will ensure that the comparative exponent

-ago must be inserted at the lower CMPR node in (214). In that position, even though the root is adjacent to (a projection of) the CMPR, the CMPR node at which insertion applies is not in turn adjacent to the root. The environment for the \emptyset allomorph is not met, and *-ago* must be inserted.

Despite the promise of this subtle result, 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 (216).

- (216) a. Karelian, Georgian [[[ADJECTIVE] COMPARATIVE] ADVERB]
 b. Basque [[[ADJECTIVE] ADVERB] COMPARATIVE]

Where the pieces are overt, Basque clearly has the structure in (216b); on semantic grounds there is no reason to consider a branching affix structure here:

- (217) 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 (218):

- (218) 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 puzzles like the Basque adverbial example just discussed remain to be solved before we can consider this point established.²¹

5.4 AAB ablaut

In discussing the CSG, I have kept the two pieces of the generalization distinct (the impossibility of the ABA and AAB patterns). 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.²²

One reason for keeping the generalizations distinct, though, is in compar-

ing the cases of comparative suppletion to other alternations. As we examine different feature structures, parallels to the CSG1 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.²³

In German, the strong verbs are characterized by vowel alternations in their principal parts, i.e., the present, preterite (simple past), 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.²⁴ 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 (219), where identity refers to identity of the stem (vowel).

- (219) 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 (220);

forms are listed in the conventional order:

(220)		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 (221) 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.²⁵

(221)		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 (219d)) follows the same logic as I have proposed for the CSG, and thus stands as an important precedent for the general reasoning pursued here. Specifically, Wiese proposes that there is a markedness hierarchy characterizing the principal parts, namely that in (222a) (Wiese 2005, 29), and crucially, that the features defining the three forms stand in a containment relation, as shown in (222b), with Wiese’s feature labels:

- (222) a. present < participle < preterite
- b. i. [] “present”
- ii. [PAST] “(perfect) participle”
- iii. [PAST, FINITE] “finite past tense”

Present is treated here as a default, thus with no defining features; (perfect) participles share with finite past forms the classificatory feature [PAST], with finite forms bearing an additional feature, [FINITE], lacking in the participles. Thus, the features characterizing (the suffix node of) the participle are contained in those for the more marked preterite.²⁶

Note that the order determined by the markedness hierarchy differs from the traditional textbook presentation of the principal parts (as in (220)) 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).²⁷ But the markedness hierarchy in (222a) 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, Afrikaans, 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 under-

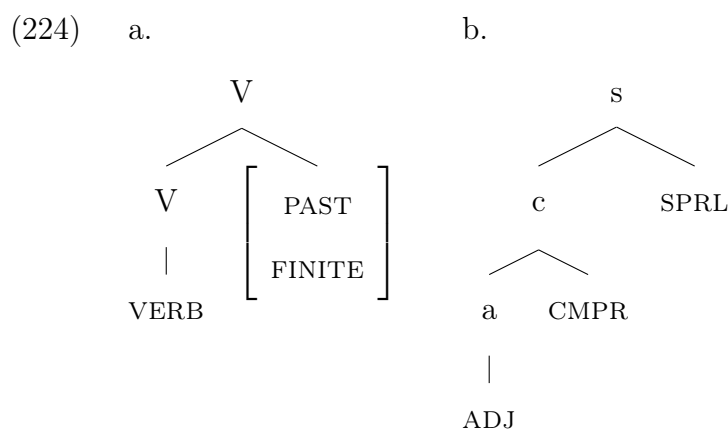
specification now applies for any rules that are conditioned by these features. In the absence of a designated form for any given category, the next most highly specified form is used. The possible patterns of syncretism, defined by (222b), are given in (223).

(223)	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), 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 (220b)), 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 AAB pattern was attested, yet in the case of the German ablaut patterns, only one of these is 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 (222b). More specifically, if the features defining

the preterite in (222b.iii) constitute a *bundle* of features, occupying a single morphosyntactic node, as diagramed in (224a), 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 (224b) — 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 both adjacent to the root.



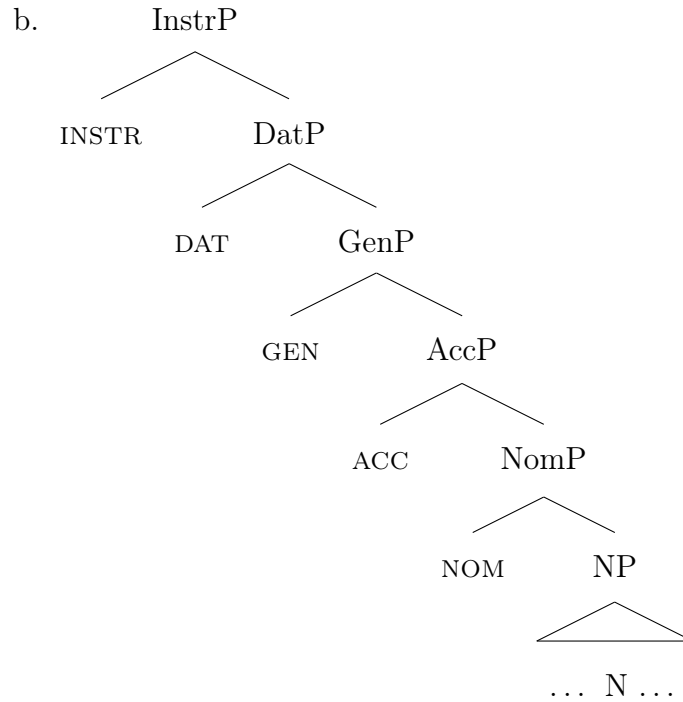
The Elsewhere logic applies when the context for one rule (R2) is a proper subset of the context of application of a more general competing rule (R1). When there are three relevant contexts, but only two rules, the Elsewhere logic prevents extension of the general rule (R1) to a context where R2 may 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 evidence 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 (225a) (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 (225b), with each node corresponding to one feature (see Chapter 7, below).

(225) a. Nominative < Accusative < Genitive < Dative < Instrumental

...

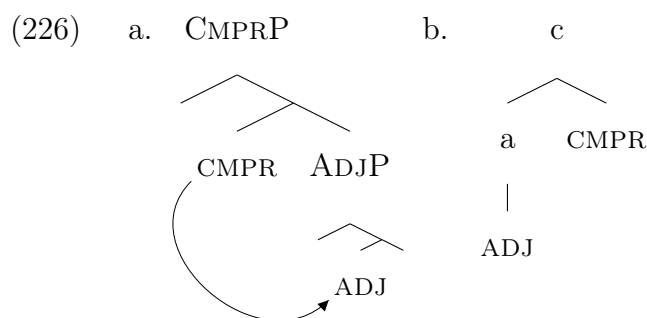


The interest of Caha's proposals for the present study is that he builds on the containment logic developed in Chapter 2 to develop an account of (mostly) unattested ABA patterns in case syncretism. Thus, for example, Accusative and Dative cannot be syncretic to the exclusion of Genitive, given the structure in (225b). 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 (226) 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.²⁸ Under the derivational architecture in (181), 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 (*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 lack the diacritic (or are marked $^{-M}$). (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 (226a) in the derivation, if the abstract ADJ node is marked $^{+M}$, then Merger applies, 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. 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 $[+M]$, based, by hypothesis, on their tacit knowledge of statistical patterns in their lexicon.²⁹ I would wager 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.³⁰

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 versus 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. Peset-

sky 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 gone. 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.³¹

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, part 1 (CSG1):

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:

(227)	POS	CMPR	SPRL	
a. English:	good	bett-er	be-st	
b. English:	bad	worse	wor-st	
c. Czech :	špatn-ý	hor-ší	nej-hor-ší	‘bad’
d. Estonian:	hea	pare-m	par-im	‘good’
e. Latin:	bon-us	mel-ior	opt-imus	‘good’
f. Welsh:	da	gwell	gor-au	‘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 (228):

(228)	ADJECTIVE	VERB	
a. English:	short	short-en	
b. English:	cool	cool	
c. German:	dick	(ver)- dick-en	‘thick-thicken’
d. Russian:	dlinn-yj	u- dlin-jat’	‘long-lengthen’
e. Finnish:	suuri	suure-ntaa	‘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 (229a). For transitive senses, Dowty proposes a further operator CAUSE as in (229b). In much of what follows, I will simplify the exposition by abstracting away from the distinction between inchoatives (intransitives) and causatives (transitives), using the symbol V_{Δ} as a shorthand for the deadjectival verbalizing operator(s), and listing only one verb form for each root in the tables.¹

- (229) 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 (230). A longer list, with some 50 cognate triples, is given in Table 6.1, below.

(230)	POS	CMPR	VERB	
a. English:	good	bett-er	(to) bett-er	
b. English:	bad	worse	(to) wors-en	
c. German :	gut	bess-er	ver- bess-er-n	‘good’
d. Russian:	plox-oj	xuž-e	u- xud-š-at ’	‘bad’
e. Finnish:	hyvä	pare-mpi	para-ntaa	‘good’
f. Georgian:	cud-i	u- ar-es-i	a-u- ar-es-ebs	‘bad’
g. (Late) Latin:	bon-us	mel-ior	mel-iōr-o	‘good’

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 will be discussed below). With appropriate caveats, the following appears to be a contender for a valid generalization, parallel to (33):

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

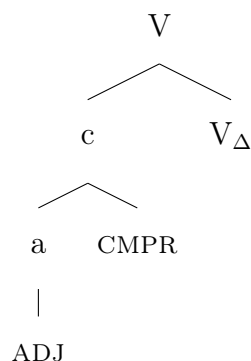
If the comparative degree of an adjective is suppletive, then the corresponding change-of-state verb is also suppletive (i.e., with respect to the positive adjective).

The generalization in (231) 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 (229), 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 (229), then, we have (232a) and not (232b):

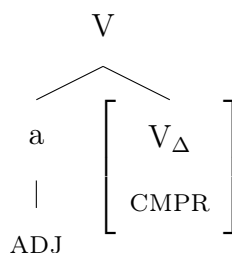
- (232) a. [[[ADJ] CMPR] V_Δ]
 b. * [[ADJ] V_Δ]

Alternatively, the structure may indeed resemble (232b), but the meaning of the operator is not Dowty’s BECOME but rather a representation in which V_{Δ} node is internally complex, crucially containing the comparative (cf. Hay et al.’s 1999 INCREASE operator, or the differential measure function \mathbf{m}_{Δ} of Kennedy and Levin 2008; see the end of this chapter for further discussion), as in (233b). Recall from above that in addition to strict nesting, as in (233a) (= (232a)), two other structures that exclude ABA patterns (by virtue of triggering elsewhere rule application) were branching affix structures (section 3.2.2) and feature bundles.

(233) a.



b.



If a comparative-containing structure is posited for all cases, then the account of the $C\Delta G$ 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 (234). 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 (232a).² (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).)

- (234) a. BAD → worse / ___] CMPR
 b. BAD → bad

While the proposal in (232a)/(233a) derives the CΔG, it stands directly at odds with Dowty's analysis, and those that have built on it (see Abusch 1986, 2005 and Rothstein 2004). One of the goals of this chapter is to show that the evidence for Dowty's analysis (essentially (232b)) is not compelling, as against the alternative in (232a), and that there are existing semantic proposals we can draw on that explain the same range of facts, starting with a structure similar to (232a), especially Hay et al. (1999), Kennedy and Levin (2008) and Winter (2006). In the final section of the chapter, I return to the 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 Russian and Tikhvin Karelian and other languages discussed in section 3.4. Nevertheless, positing that the containment hypothesis holds of the syntactic relationship anchors the account of four proposed universals: the CSG parts 1 and 2, 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:

(235) a. The weather became worse.

b. The weather became bad.

(236) 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, (236a) 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, (236b) 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 (232a) is more narrowly proscribed; the semantics alone does not preclude (232b), 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 (230), I have presented only ABB patterns, and one could well ask whether the CΔG patterns with or against the CSG as regards other possibilities.³ 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 (237).

(237)	POS	CMPR	VERB
a.	many	mo-re	???
b.	small	small-er	???
c.	tall	tall-er	???

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 (237), these must be suppletive. By meaning alone, perhaps *(to) increase* or *(to) multiply* might fit the bill for (237a), 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 (237b), with *(to) grow* in (237c) 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 and can be pressed into service to fill a gap.⁴ In any event, with no clear way to establish that there is 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 (232a) 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).⁵ 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* – **modernier* – *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 (230) and also examples without suppletion in (238):

(238)		POS	CMPR	VERB	
a. English:	low	low-er	(to) low-er		
b. German:	schön	schön-er	ver- schön-er-n		‘beautiful’
c. German:	groß	größ-er	ver- größ-er-n		‘big’
d. Late Latin:	cert-us	cert-ior	cert-iōr-o		‘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 (238), others do not (see (228)).⁶ Moreover, while the comparative morphemes are frequently identifiable in the superlative examples (230), examples like (238) 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, thus leaving an important question unanswered.

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 (239a) and atelic (239b) frames, as diagnosed (roughly) by the presence of time frame (*in an hour*) and durative (*for an hour*) adverbials, respectively:⁷

- (239) 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 (239), in (240). For these, standard telicity diagnostics yield generally unambiguous results:⁸

- (240) 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, (239a) is most naturally understood as synonymous with (240a) implying that the soup in fact became cool, whereas (239b) implies only that the soup became cooler (i.e., than it was), as (240b), 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), and for a recent critical overview Kriz (2011). 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), Winter (2006) and Kennedy and Levin (2008).

The most potentially problematic view from the semantics literature, for our perspective, is the original proposal in Dowty (1979), extended in Abusch

(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, as in (229), repeated here:

- (229) a. [BECOME [*x* COOL]]
b. [CAUSE [BECOME [*x* COOL]]]

Dowty proposes to derive the apparent comparative sense of the atelic expression in (239b) 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 adjective, 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, on the same *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_{-1} ” (Dowty 1979, 90). He offers the diagram in (241), where P is *cool* to visualize

this:

$$\begin{array}{cccc}
 (241) & t_{-3} & t_{-2} & t_{-1} & t \\
 & \neg P & P & & \\
 & & \neg P & P & \\
 & & & \neg P & P
 \end{array}$$

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*, then 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 (Bennett and Partee 1978, Dowty 1979).⁹

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 (241) “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 (242b) alongside (242a).

- (242) a. [[ADJ] V_Δ]
 b. [[[ADJ] CMPR] V_Δ]

This view would permit a committed proponent of a Downtian account to maintain that account for (239), while admitting of the derivation in (242b) for verbs with the suppletive roots (such as *(to) worsen*, as well as for forms from other languages in (230)), 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, namely *(to) lower*, but there are more,

for example, in German, such as *vergrößern* ‘to enlarge etc.’ < *größer* ‘larger’ < *groß* ‘large’, cf. (238).¹⁰

An approach positing two representations along these lines seems inadequate, however.

In the first place, if both representations in (242) are available, then we would expect suppletive adjectives to contribute two deadjectival verbs, distinguished by meaning and telicity. From *bad*, the derivation in (242a) would yield a telic verb *(to) badden* alongside uniquely comparative, thus atelic, *to worsen*. But this is not the case. 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:

- (243) 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*:

- (244) 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 (245) illustrates this with a suppletive root, while those in (246)-(247) illustrate with regular, i.e., non-suppletive adjectives.¹¹

- (245) a. Die Situation hat sich 1 Jahr lang ver-bess-er-t
the situation has REFL 1 year long PREF-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
PREF-bett-ER-PRTCP
‘The situation improved (severalfold) in one year.’ (telic)
- (246) a. Das Geschwür hat sich 1 Jahr lang ver-größ-er-t
the abscess has REFL 1 year long PREF-big-ER-PRTCP
‘The abscess grew for one year.’ (atelic)
- b. Das Geschwür hat sich in 1 Jahr (um 1 cm)
the abscess has REFL in 1 year (by 1 cm)
ver-größ-er-t
PREF-big-ER-PRTCP
‘The abscess grew (1 cm) in a year.’ (telic)

- (247) a. Der Schneider hat die Hose eine Stunde lang
 the tailor has the trousers 1 hour long
 ver-läng-er-t.
 PREF-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
 ver-läng-er-t.
 PREF-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 (242b) 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 (242a) is unavailable for these adjectives. Why might that be? The strongest view would be that the representation in (242a) 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.

Note also in this context that questions arise as to the meaning and combinatorial properties of V_{Δ} in (242). Roger Schwarzschild points out (personal communication 2006) that allowing an operator like Dowty's BECOME to combine with a comparative as well as the positive form of the adjective may make incorrect predictions. If BECOME is (as Dowty held it to be) a sentential operator, then allowing it to embed a comparative as in (242b) would predict that the arguments of the comparative predicate would be allowed with the derived verb, just as they are in periphrastic embeddings. For the standard argument (expressed as a *than*-clause), this is strikingly false: a true embedding under *become* freely allows a *than*-clause (see (248b)), but inclusion of a *than*-clause with the deadjectival verb is simply horrendous (248c):

- (248) a. The soup is cooler (than it was / than the gravy).
b. The soup became cooler (than it was / than the gravy).
c. *The soup cooled {than it was / than the gravy}.

The operator V_{Δ} that embeds the comparative in (242b) thus cannot be Dowty's BECOME operator, but must, at the least, contribute the meaning 'than x was before' (more precisely, immediately before the event). In this way, the verbalizing element is similar to the element SPRL that embeds the comparative (discussed at length above). The element SPRL means

(effectively) ‘than all (others)’ and uses up or binds the argument slot for standard in the comparative it embeds. Superlatives are thereby incompatible with a *than*-clause: *Leo is taller than the other children* versus *Leo is the tallest* (**than the other children*) (see also discussion of (135) in Chapter 3).

Now, one might take a different perspective on the facts in (248). Den Dikken et al. (2010) take issue with the proposal given here and argue that the impossibility of a *than*-phrase with the deadjectival verb (248c) shows instead that there is no comparative morpheme at all within the verb, and that an alternative semantics should be sought. But the impossibility of an overt expression of the standard argument with deadjectival verbs such as *to cool* cannot be taken as an argument against the presence of a (silent) comparative element in those verbs, since the same pattern holds when the comparative element is overt, whether in a suppletive (249) or transparently compositional (250) derivation:

- (249) a. Our chances are better than (they were) yesterday.
b. Our chances became better than (they were) yesterday).
c. * Our chances bettered than (they were) yesterday

- (250) a. Die U3 ist läng-er (als sie früher war / als die U4)
 the U3 is long-CMPR (than it earlier was / than the U4)
 ‘The U3 (subway) is longer (than it was / than the U4)’
- b. Sie haben die U3 läng-er gemacht (als sie früher war
 they have the U3 long-CMPR made (than it earlier was
 / als die U4).
 / than the U4)
 ‘They have made the U3 longer (than it was / than the U4.)’
- c. * Sie haben die U3 ver-läng-er-t (als sie früher
 they have the U3 PREF-long-CMPR-PTCP (than it earlier
 war / als die U4).
 was / than the U4)
 ‘They have made the U3 longer (than it was / than the U4.)’

Examples such as the above point to the verbal operator as contributing the meaning ‘than x was before’ in a deadjectival degree achievement. The presence of this element, like the superlative, uses up the standard-denoting argument of the comparative, and prevents the expression of a *than*-phrase.

These considerations remove the major hurdle from Dowty’s analysis for the general theoretical view put forward here. No compelling reason remains in the literature surveyed for uniformly deriving degree achievements from positive adjectives directly. Variable telicity (and incompatibility with a *than* phrase) arise even in the presence of overt comparative morphology in

the verbs, and are not consequences of embedding a plain adjectival root. 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) and 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 (240b) 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 the limits of 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 (251). 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 (240b) telic (see (251c)):

- (251) 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 a 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 this 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 (252):

- (252) a. Mary drank a glass of beer (in a minute).
b. Mary drank beer (for an hour).

In the pair in (252), 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 (239) 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 (239a). 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 (240a), 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.*¹²

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 (252) 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:

- (253) 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:

- (254) The workers are widening the road. \Rightarrow The workers have widened the road.

- (255) Kim is straightening the rod. \nRightarrow Kim straightened 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 the 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, 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 more X’ readings.¹³ 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.¹⁴

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 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.¹⁵ 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 (243)-(246), 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_{Δ} , and that this morpheme may

only combine with comparative stems (see (242)). Other morphemes may exist which derive verbs from adjectives, which are not restricted, or even expected, to embed the comparative. Russian, for example, has deadjectival verbs which are ambiguous between stative and change-of-state readings, such as that in (256):¹⁶

(256) **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). 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 ‘small’ shows suppletion in the comparative (257), 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 (257a). On the other hand, the verb from the positive root is an ascriptive, rather than a change-of-state verb (257b):

(257)	POSITIVE	COMPARATIVE	VERB	
a.	mal-yj	men'-še	u-men'-š-at'	'to shrink'
b.	mal-yj	men'-še	u-mal-jat'	'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 apart their meanings, with root *xoroš-* taking over the basic sense of 'good' (expressed by *dobr-* in the other Slavic 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(s)* 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 *góðian* ‘(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	bett-er	bett-er	English; oth. Germanic
good	dobry	lepsz-y	po- lepsz-yć	Polish; Czech
good	xoroš-ij	luč-š-e	u- luč-š-at'	Russian
good	dobar	bol-ji	po- bolj-š-ati	Serbo-Croatian; Slovenian
good	$\left. \begin{array}{l} \text{dobr-yj} \\ \text{harn-yj} \end{array} \right\}$	krashch-yj	po- krashch-yty	Ukranian
good	bonus	mel-ior	mel-ior-are	Latin; Modern Romance
good	da	gwell	gwell-a	Welsh
good	agath-ós	belt-īōn	belt-i-óō	Anc. Greek
good	agath-ós	kreíss-ōn	kreiss-óō	Anc. Greek
good	on	hobe	hobe-tu	Basque
good	hyvä	pare-mpi	para-ntaa	Finnish
good	k'argi-i	u- mjob-es-i	a-u- mjob-es-ebs	Georgian

Table 6.1: Deadjectival verbs from suppletive adjectives

GLOSS	ADJ	CMPR	VERB	LANGUAGE; COGNATES
bad	bad	worse	worse-n	English
bad	$\left. \begin{array}{l} \text{dårlig} \\ \text{ille} \\ \text{ond} \\ \text{vond} \end{array} \right\}$	ver-re	for- ver-re (s) (seg)	Norwegian; oth. Scandinavian
bad	dålig	säm-re	för- säm-ra (-s)	Swedish
bad	šlext	erg-er	var- erg-er-n	Yiddish
bad	$\left. \begin{array}{l} \text{špatn-ý} \\ \text{zl-ý} \end{array} \right\}$	hor-ší	z- hor-š-ít (se)	Czech
bad	plox-oj	xuž-e	u- xud-š-at'	Russian
bad	pohan-yj	hir-š-yj	po- hir-š-yty	Ukranian
bad	mal-us	pěj-or	pej-or-are	Latin; Modern Romance
bad	dolent	pitjor	em- pitj-or-ar	Catalan

Table 6.1: Deadjectival verbs from suppletive adjectives

GLOSS	ADJ	CMPR	VERB	LANGUAGE; COGNATES
bad	cattiv-o	peggiore	peggior-are	Italian
bad	drwg	gwaeth	gwaeth-ygu	Welsh
bad	kak-ós	cheiró -ter-os	cheiro -ter-eýo	Mod. Greek
bad	kak-ós	héss -ōn	héss -áomai	Anc. Greek
bad	cud-i	u- ar -esi	a-u- ar -es-ebs	Georgian
big	velk-ý	vět -ší	z- vět -š-ít	Czech; Polish, Serbo-Croatian
big	velyk-yj	bil' -sh-yj	z- bil' -sh-yty	Ukrainian
large, big	mawr	mwy	mwy -hau	Welsh
much, many	viel	mehr	ver mehr-en	German; oth. Germanic
many,much	asko	gehi -ago	gehi -ago-tu	Basque
much	paljo-n	ene -mmä-n	ene -tä	Finnish
many	bevri	met' -i	amet' ebs	Georgian
many	küp	artıq	arttı -rıřğa	Tatar

Table 6.1: Deadjectival verbs from suppletive adjectives

GLOSS	ADJ	CMPR	VERB	LANGUAGE; COGNATES
small	mal-i, malen	man -ji	uman -ji-ti	Serbo-Croatian; oth. Slavic
small, few	$\left\{ \begin{array}{l} \text{lille, lidt} \\ \text{små} \end{array} \right\}$	mind -re	(for-) mind -ske(-s)	Danish; oth. Scandinavian
small, little	parv-us; paul-um	min -or	min -or-are	Latin; Modern Romance
few	weinig	mind -er	ver mind -er-en	Dutch
few, (a) little	$\left\{ \begin{array}{l} \text{few} \\ \text{(a) little} \end{array} \right\}$	less	less -en	English
small	bach	llai	lle i-hau	Welsh ¹⁷
small	mikr-ós	meí -ōn	mei -óō	Anc. Greek
small	mikr-ós	eláss -ōn	elass -óō	Anc. Greek
little, few	olíg-os	héss -ōn	héss -áomai	Anc. Greek
little, few	olíg-os	meí -ōn	mei -óō	Anc. Greek
few	cot'a	na- k'l -ebi	-k'l- ¹⁸	Georgian

Table 6.1: Deadjectival verbs from suppletive adjectives

GLOSS	ADJ	CMPR	VERB	LANGUAGE; COGNATES
old	gammel	æld -re	(for-) æld -es	Danish; oth. Scandinavian
near	agos	nes	nes -u	Welsh
strong	cryf	trech	trech -u	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 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 Dowtian approach to deadjectival degree achievements, as noted above. Although a good deal of space is devoted here to seeking alternate explanations for apparent counterexamples, it should be borne in mind that the number of apparent problems is quite small in comparison to the 50 or so cases just presented that are all consistent with the generalization (but which for that very reason require no further discussion).

6.4.1 Ancient Greek *goods*

We may begin with a consideration of Ancient Greek, as it provides a relatively straightforward case.¹⁹ The Ancient Greek adjective *agath-ós* ‘good’ is a rich example of suppletion, entering into a one:many relation with a variety of comparative allomorphs. The following is a standard listing, from Seiler (1950), Chantraine (1967), repeated from (141):

(258)		POS	CMPR	SPRL	
	Anc. Greek:	agathós	ameínōn		‘good’
	(also):		beltíōn	béltistos	
	(also):		kreíssōn	krátistos	
	(also):		lóion	lōistos	
	(also):			phéristos	

Additional suppletive comparative forms in *-teros*, such as *bélteros*, *lōítēros*, *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 beginning in the *Septuagint*, regular (non-suppletive) 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 standard presentation, which omits the regular comparatives in tables such as (258), 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).²⁰

- (259) I'm trying to badden up my image, like that Sabrina the Teenage Witch is trying to do. (<http://www.melissajoanhart.net/sightings.shtml>, attributed to Ray Romano, speaking to Regis Philbin, April 2000)
- (260) Or is it, as we suspect, part of a new programme to badden up the image of the perennial good guy? (<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*:²¹

- (261) 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 (140)).

- (262) 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 *badden*, an ABB and an AAA pattern, distinguished by meaning. The examples in (259)-(260) turn out on inspection to be exactly as predicted by 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.²² The adjectives meaning ‘good’ and ‘bad’ compare suppletively, following the general pattern in Slavic, as in (263). 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.)

(263)	POS	CMPR	VERB	
a.	dobar	bol-ji	po- bolj -š-ati (<i>se</i>)	‘good’
b.	zao (zl-)	gor-i	po- gor -š-ati (<i>se</i>)	‘bad’
c.	loš	gor-i	po- gor -š-ati (<i>se</i>)	‘bad’

So far, so good. But alongside the standard forms in (263), the forms *prodobr-iti (se)* and *pro-zl-iti (se)* are acceptable to some speakers, and occur in various contexts. Not all speakers accept the verbs based on the positive root, but those who do report differences in meaning.²³ 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) and 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 (264) 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).

- (264) 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 (265a). If the sentence in (265b), with the verb from the positive root, is acceptable, then it means only that the thief became good in the moral sense.

- (265) a. Ovaj lopov se po-boljš-ao
 This thief REFL PRF-better-TV.MSG
 ‘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.²⁴ The paradigm in (266) illustrates:

- (266) 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.’ (unambiguous: more skillful)
- c. On je dobar fudbaler, ali ovaj je još bolji.
 He is good soccer.player, but this is even better
 ‘He is a good soccer player, but this (one) is even better.’ (unambiguous: 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 subject to comparison. For unclear reasons, moral goodness is evidently not a gradable property in Serbian. 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.²⁵

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-š-at*.²⁶ 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.²⁷ This verb is used impersonally, as illustrated in (267b) corresponding to the impersonal construction in (267a). In this usage, the adverb appears to compare suppletively: *mne xuže* ‘I feel worse’, so the considerations regarding previous apparent counter-examples do not apply.²⁸

- (267) 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 (267b). This may suggest a derivation

of the apparently offending verb that follows an alternate route to verbhood, avoiding V_{Δ} 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’ \rightarrow *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 (268a) is the one that has been the focus of this chapter, and involves V_{Δ} and thus the comparative, deriving *u-xud-š-at’* with the comparative allomorph. The structure in (268b) is the combination of the inceptive *po-* with the (abstract) stative-forming morpheme V_{STATE} , mentioned in conjunction with (256).

- (268) a. [[[ADJ] CMPR] V_{Δ}]
 b. [INCEPT [[ADJ] V_{STATE}]]

Transparent use of inceptive morphology to form inchoative verbs from adjectives is evident in Ingush (Nakh-Dagestanian, Nichols 2011, Chh. 15, 21). The elements *-lu* and *-d.oal* form inceptives with verbs (as in (269b)) but intransitive change-of-state verbs from adjectives (in (269a)).²⁹

(269)	a.	ADJECTIVE		VERB	
		d.waaixa	‘hot’	d.woax-lu	‘get hot’
		niisa	‘straight’	niis-lu	‘become straight, level’
		kura	‘arrogant’	kur-d.oal	‘become arrogant’
	b.	VERB		INCEPTIVE	
		qier-	‘fear’	qiera-lu	
		d.iesh-	‘read’	diesha-lu	
		laz	‘hurt’	laza-d.oal	’

The Ingush examples establish the independent plausibility of using inceptive morphology with stative (adjectival) predicates to derive inchoative meanings. To the extent an inceptive analysis can be sustained as a possible alternative route to verb formation, bypassing V_{Δ} and the comparative, it is somewhat of a two-edged sword. On the one hand, it avoids the otherwise problematic character of (267b), removing yet one more apparent counterexample. On the other, it points to a subtlety in the predictions of the $C\Delta G$ — 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 $C\Delta G$ (‘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 as it permits

surface violations of the CΔG. For Russian, we may at least point to the independent evidence for the constituent pieces of this alternative derivation, but the general 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 (270), with the corresponding suppletive comparatives (see section 4.3 for many more examples of suppletive comparatives of ‘many/much’ terms):

(270)		POS	CMPR	VERB
	a. German	viel	meh-r	ver- viel -fach-en
	b. Hungarian	sok	tö-bb	sok -as-odik
	c. Hungarian	sok	tö-bb	sok -szorosít
	d. Finnish	monet	usea -mmat	monin -kertaistaa
	e. Russian	mnogo	bol’š-e	u- množ -at’(-sja)

It is not clear that ‘(to) multiply’ really stands in the right semantic relation to ‘many’ to consider these problematic in the first place. 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 (271) (distinct from the intransitive verbal affix in (270b)). With *sok* ‘many’, the ordinal corresponds roughly to casual English *umpteenth*.

- (271) a. öt = 5 ötö-dik = 5th öt-szöröz = ‘quintuple’
 b. sok = ‘many’ soka-dik = ‘many-th’ sok-szorosit = ‘multiply’

The verb-forming patterns in (270) 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_{Δ}) that derives degree achievements from adjectival roots.

In addition, some examples, including the Hungarian and German examples in (270a-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 (270a) is de-

rived, 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 (270) 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

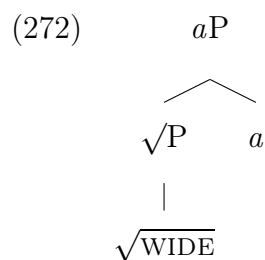
It is worth noting that some of the forms in (270) involve compounds, rather than affixal structures. Thus in Hungarian, the verb *szoroz* on its own means ‘(to) multiply’; the forms in (271) appearing to be compounds of this verb with a numeral. In discussing Armenian superlatives above (sections 3.4.1 and 4.3.1), 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 (270c) fall beyond the reach of the trigger for comparative suppletion.

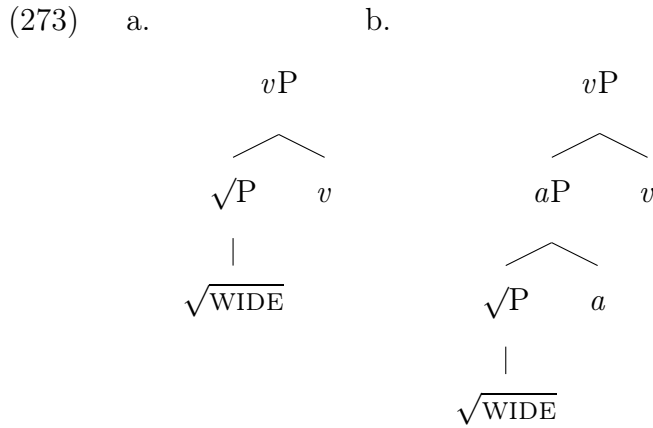
This consideration appears to be relevant for other derived verbs as well. The Modern Romance languages have verbs such as Italian *bonificare*, French *bonifier* ‘improve’, apparently derived from the positive root *b(u)on-* ‘good’, alongside *migliorare*, *ameliorer* from the suppletive comparative 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 by the CΔG). On the other hand, the verbs containing *-ifti-* ultimately derive from periphrastic / compound constructions in Latin *bonu(m) facere* ‘good make/do’ (with subsequent morphophonological adjustments, A. Calabrese, personal communication, 2009). The theory of locality presented in Chapter 3 ensures that syntactic (periphrastic) complementation structures will not be suppletive (see 235). 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 *-ifti-*.

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 (272), with a root (symbolized $\sqrt{\quad}$) 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; see also Borer (2005, 2009) for a dissenting view.



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 (272), there are thus (at least) two distinct derivations that will yield a verb, as in (273):



Of these, only (273b) 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 (273) by Merger or head movement), a key distinction potentially emerges. The root in (273a) is close enough to the head *v* to be conditioned by it, while the root in (273b) is not. (This reasoning assumes that the comparative element is near or within the *v* node in (273); cf. (233b)). If the *-ifi-* derivations involve outer morphology, as in (273b), 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 thus with different routes (derivations) correlating with different roots (allomorphs). As with 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 *górdian*, 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* ‘gooded’ and *iwurset* ‘worsened’, strongly suggesting a meaning relevant to the current study. Note that Old English *górdian* 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 *vešt-*), but where the change-of-state verb is built on the positive root: *vŭz-velič-iti*. It is perhaps worthy of note that in the modern Slavic languages, the situation has resolved itself for the most part. 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-velič-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'sh-yj* 'big – bigger') but has undergone changes in the verbal domain, with *voz-velyč-yty* taking on the specialized meaning of 'to glorify' and the general verb meaning to increase built on the comparative: *z-bil'sh-yty*. Serbo-Croatian retains the suppletive adjectives, and a doublet in the verbs (with the problematic *u-velič-ati* limited to the causative/transitive usage).³⁰

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-lep-sz-yć się* '(to) get better' but also an inchoative verb *dobrz-eć* 'to get better', and also *mal-eć* alongside *z-mniej-sz-yć się* (both) '(to) get smaller' (W. Browne, personal communication). 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.³¹

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 CΔG. I considered some of the theoretical ramifications of that conclusion. On the empirical side, this chapter has been somewhat more tentative than the preceding chapters — the CΔG is surprisingly robust, though problematic cases remain. Although I have devoted much more discussion to the problematic cases, note that they are firmly in the minority. Against the three truly problematic-looking cases in section 6.4.7, note that the tally of CΔG-consistent ABB examples collected in Table 6.1 runs to some 50 or so cognate sets. 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 7).

A somewhat more radical possibility (though one that is not free of problems), is to build the comparative meaning into V_{Δ} 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}_{Δ} . The

function, applied to an individual x and an event e , measures the difference in which x changes in **m**-ness over the course of e , where **m** is some property, denoted by the adjective in the case of deadjectival degree achievements. Kennedy and Levin (2008) suggest that \mathbf{m}_Δ is a special case of what they call in related work (see Kennedy and McNally (2005)) a differential measure function \mathbf{m}_d^\uparrow .³² 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. Seeing the measure of change as difference over time, the key meaning component of V_Δ effectively incorporates a special case of the comparative meaning. Like the superlatives, the degree achievements 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 Δ component is in all relevant respects the same linguistic entity as CMPR, though here rolled into the verbalizing affix, as in (233b).

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 a (positive) change along a two-point scale: 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 (238) from regular comparatives, and 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 – xuč-e (< xud-) – u-xud-et*³³. Such forms appear to be what a theory treating the Δ of \mathbf{m}_Δ (or V_Δ) as the comparative might predict.³⁴

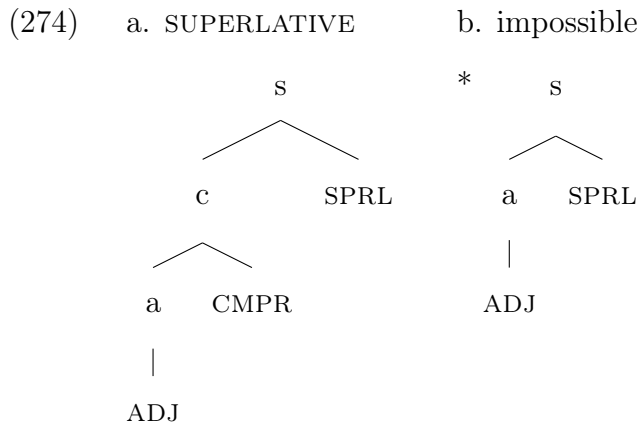
Acknowledging that important questions thus remain, I leave further exploration of this direction for future work.

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 (274a) (and/or in the branching-affix structure in (68)), 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 (274b) 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, suggesting a parallel containment hypothesis: $[[[\text{ADJ}] \text{CMPR}] \text{V}_\Delta]$, and not $[[\text{ADJ}] \text{V}_\Delta]$.

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’, typically assigned to *-est*, is not.

But a more interesting question, of course, would be whether we could derive this result from some prior or deeper consideration. Rather than stipulating a universal morpheme inventory, 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):¹

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 (275a) (when cross-classifying features such as number, gender, etc. are factored out):

(275)

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 (275b). 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). There are at least five such universally unattested contrasts:

(276) **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)

Instead of the classical three-value system, the two value binary system in (275c) — 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 neutralization of one or more possible contrasts) outnumbering ‘unnatural’ patterns (presumably historical accidents) by a factor of roughly 9:1.²

The conclusion to be drawn from this data is that UG includes a set of primitives from which morpheme meanings are constructed. In the realm of person features, this set includes [(+)1] and [(+)2] (and perhaps a grouping

feature, [PARTICIPANT] defined as the union of these), but no others. To date, UG remains the most plausible source of these feature restrictions. No language-external, functionalist account has succeeded in providing any deeper understanding of why language marks only a small, and specific subset of the relevant conceptual distinctions in this domain (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 (274)) 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:³

(277) UG imposes a maximum of one interpretable syntactic feature per lexical or functional element.

I suspect the stricture in (277) 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 types of meanings are complex in ways that the resources of UG cannot pack into a single morpheme.⁴ 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.

In light of the evidence presented in this book, inasmuch as he invokes an element *-est* in forming the superlative from the adjective (or determiner), Hackl did not decompose 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.

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 (274b) follows on the one hand, since there cannot be a single, indivisible morpheme with the complex meaning ‘more than all (others)’, and on the other, because an attempt to combine a SPRL morpheme (meaning just ‘than all (others)’) with the adjective root in the absence of a comparative element will simply fail to yield a valid interpretation. The Containment Hypothesis is thus a

specific consequence of the Complexity Condition.

7.2 Lesslessness

A general complexity condition of this sort should manifest itself in a variety of detectable contexts. 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. Outside of comparatives, there is at least a point of contact with the long-discussed domain of missing (i.e., never lexicalized) logical operators, famously discussed in Neo-Gricean terms in Horn (1972, 1989) and reexamined by many since (for a sample, see Jaspers 2005, Penka 2007, Katzir and Singh 2009). Of the four corners of the traditional Square of Opposition, three are found as lexical items across languages: an existential, a universal, and a(n often marked) negative, cf. English *some*, *all*, *none*, but the fourth member of the set, a quantifier meaning *not all*, is never lexicalized (**nall*). The pattern repeats itself through an array of quantifiers and connectives, a deeply systematic gap. A component of (at least) some approaches to this distribution rests in part on the internal complexity of the logical operators, given a set of primitives — the missing meanings are necessarily complex, and blocked by an economy condition favouring the use of simpler inventories.

Returning to the domain of comparative morphology, there is one further

generalization that may support the general idea of constraints on morpheme meanings, namely, the generalization I called *Lesslessness* in the Introduction.

(278) 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 (279), the lower right hand cell is universally empty.

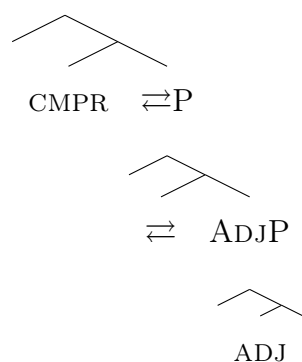
(279)		analytic	synthetic
	a. superiority	more ADJ	ADJ-er
	b. inferiority	less ADJ	*

This generalization is empirically the strongest of all the generalizations considered in this book. In none of the more than 300 languages examined for this study did anything remotely resembling a counter-example appear.⁵

The Complexity Condition may get us some way (though not all the way) towards an understanding of (278). 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, Büring 2007 who call the operator

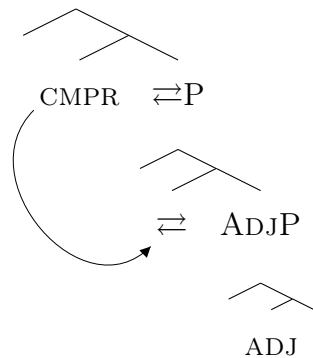
LITTLE, and also the operator \circ in Katzir and Singh 2009; on the semantics of such an operation see especially Sassoon 2007, 2010). If there is indeed a Complexity Condition along the lines of (277), it seems a priori plausible that the combination of these operators would be subject to this condition, and thus impossible at the sub-morphemic level. The underlying representation of a comparison of inferiority would necessarily be morpho-syntactically decomposed, along the lines in (280):

(280) CMPRP



A periphrastic comparative of inferiority, as in English *less tall*, is modeled straightforwardly, if CMPR and \equiv combine, but the two do not undergo merger with the adjectival root. The derivation is given here, and is entirely parallel to the derivation of a periphrastic superlative in (115) in Chapter 3.

(281) CMPRP



This analysis treats *less* as a portmanteau spelling out CMPR + ⇌ (and is why Rulmann and Heim treat ⇌ as expressing LITTLE, in its quantificational sense, opposite of *much*). The key morphological pieces are clearly visible in languages like German (*wenig-er* ‘less’ = *wenig* ‘little, few’ -er CMPR) and (Modern) Greek (*ligo-ter-os* ‘less’ < *lig-os* ‘little, few’). The following examples (from Jason Merchant, personal communication 2011) show the Greek element in its quantificational sense (comparative of ‘few’) and in its use forming periphrastic comparatives of inferiority.⁶

(282) a. Exo lig-a vivlia.

I.have few-N.PL book.N.PL

‘I have few books.’

b. Exo ligo-ter-a vivlia apo sena.

I.have few-CMPR-N.PL book.N.PL FROM you

‘I have fewer books than you.’

- (283) Imo ligo-ter-o nevriasmen-os apo sena.
I.am few-CMPR-N.SG annoyed-M.SG FROM you
'I am less annoyed than you.'

As Merchant observes, the Greek data illustrate another generalization, which provides additional grounds for deriving comparatives of inferiority from comparatives of superiority, as proposed here. Specifically, in languages with morphological or periphrastic comparatives, the gross syntax including the standard marker is the same for inferiority and superiority (English *than*, German *als*, Greek *apo* in (283) etc.).⁷ There is no general reason why this formal identity should hold; for other degree constructions, such as those of equality, a different marker of the standard, and sometimes a different morphosyntax altogether, is used. So, if *more* and *less* were simply distinct DEGREE heads, then like equative *as*, we might expect to find them combining with differing markers for the standard phrase. However, while the English-like pattern in (284a) is replicated in language after language, the pattern in (284b), with a distinct marker for the standard of inferiority appears to be unattested. This follows, of course, if the major functional component of a comparison of inferiority is the same CMPR element as in comparatives of superiority, as schematized in (281).

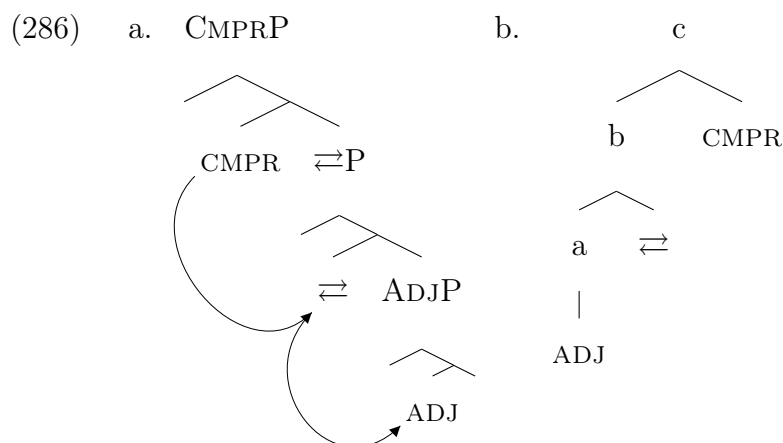
(284)	a. attested	b. unattested
equality	as ... as	as ... as
superiority	more ... than	more ... than
inferiority	less ... than	less ... X

The polarity-reversing operator \rightleftharpoons clearly has affinities with negation (though it is not semantically identical to simple negation as such, see Buring 2007, Sassoon 2010 for comments). If we allow that it may in fact be expressed as a species of negation in some languages (*short* is *not-tall*) then we find transparent reflections of (281) in some languages. In Komi, the comparative suffix *-ǧik* attaches to adjectives to form regular comparatives ((285a), from Lytkin 1966, 288), while *less*-comparatives are formed by adding the comparative suffix to the negative particle *abu*, as in (285b) (Hausenberg 1998, 314, see Coates 1982 for further discussion). The comparative in (285b) transparently corresponds to the output of Merger in (281), with *abu* as the exponent of \rightleftharpoons .

(285)	a. bur	bur-ǧik
	‘good’	‘good-CMPR’ i.e., ‘better’
	b. mič ^j a	abu-ǧik mič ^j a
	‘beautiful’	‘NEG-CMPR beautiful’ = ‘less beautiful’

Now consider the derivation that would be needed to represent a synthetic comparison of inferiority. Just as (280) and (281) derive periphrastic constructions, the corresponding synthetic construction requires Merger (or

Head Movement, or Lowering) to combine all three heads in (280), as shown in (286a), generating the complex morphological object in (286b):



Recall that the initial motivation for the operator \rightleftharpoons was to represent polar antonyms: *short* is $[[\text{TALL}] \rightleftharpoons]$. With this in mind, we see that the putative synthetic comparative of inferiority in (286b) for some adjective, is in fact indistinguishable from the regular comparative (i.e., of superiority) of the polar antonym. In other words, if $[[\text{TALL}] \rightleftharpoons]$ is pronounced *short*, then $[[[\text{TALL}] \rightleftharpoons] \text{CMPPR}] = \textit{shorter}$. In essence, if the Complexity Condition can be invoked to force (286) 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.

The assumption, mentioned at various points above, that vocabulary insertion proceeds cyclically from the most deeply embedded node outwards

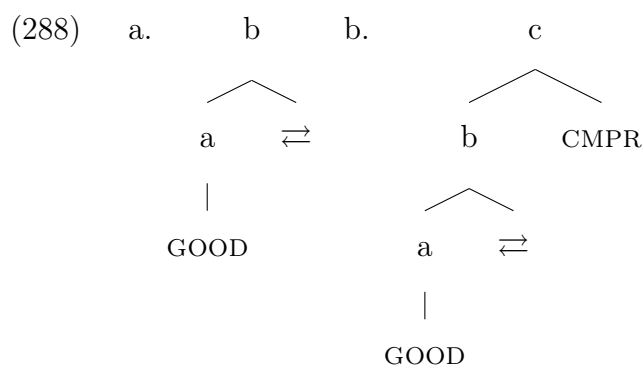
(see Bobaljik 2000b, Embick 2010) will ensure that spell out of the node *b* in (286b) will take precedence over alternatives, ensuring the blocking result just mentioned.⁸

The competition effect invoked here appears to be directly visible in Sonora Yaqui, as described in Dedrick and Casad (1999). Comparatives in this language are formed periphrastically, with the (sometimes optional) particle *čé'a*. For adjectives that have a lexical polar antonym, a comparison of inferiority is expressed by the (simple) comparative of the antonymous adjective (i.e., ‘more small’ for ‘less big’). But for adjectives that lack a lexical polar antonym, negation is used to derive one, as in (287) among other examples (Dedrick and Casad 1999, 111). The two alternations flesh out exactly the alternation just posited, with all the pieces of (280) overt when no portmanteau form is listed to express the polar antonym.

- (287) a. *čé'a húní'i tú'ii*
 more even good
 ‘it is even better’
- b. *čé'a húní'i kaa-tú'ii*
 more even not-good
 ‘it is even worse’

Decomposing antonymous adjective pairs 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 (288a), with the corresponding comparative in (288b):



English *worse* spells out the structure in (288b) 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 of higher nodes. If *bad* is a portmanteau for the *b* node in (288), then no adjacency violation arises with *worse*, which latter is either a portmanteau for the whole structure in (288b), or a contextual allomorph for the *b* node, conditioned by the adjacent CMPR head.

Of course, not all gradable adjectives denote properties for which there are polar antonyms (see Sassoon 2007, 2010). 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 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 . That is, the combination [[BLUE] \rightleftharpoons] is simply undefined. If this is sufficient to block the lower step of Merger in (286a), then the logic would 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, in accord with the facts.

The appeal to the Complexity Condition in explaining the universal impossibility of synthetic comparatives of inferiority (278) thus finds some initial plausibility. Fleshing it out in further detail may nevertheless prove tricky for various reasons. One area of concern is alternative structures to (280). The complexity condition only ensures that CMPR and \rightleftharpoons enter the derivation as distinct heads, but it does not specifically require the hierarchical nesting in (280). 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 results from (280)-(286) could be undermined, and an alternative derivation for the universally unattested morphological comparison of inferiority may 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.

There are also 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 (286) 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 (on which 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. 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 (287b); 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 Derbyshire (1985, 14) writes:

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 posi-

tive form: *kawo* ‘long’ and *kawohra* ‘short’ ... *tiyoke* ‘sharp’ and *iyohra* ‘blunt’ ... *atahurmakaxaho* ‘one that is open’ and *atahurmakahnī* ‘one that is shut’...

Hixkaryana shows that a language may make transparent use of compositional means to express polar antonyms with a negative-like, polarity-reversing operator. While perhaps uncommon — or more accurately: frequently masked by an inventory of portmanteau terms for basic pairs — I take it that the possibility of this derivation is established. Building on that observation, the complexity condition envisaged here could underlie an account of the *Lesslessness* generalization in (278). 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: Adjacency and Bundling

I suggested earlier in this chapter that the motivation for lexical decomposition is a complexity condition, which I speculated is ultimately semantic in nature. 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, and for related ideas, Williams 2003). Recall also from the beginning of this chapter that Kayne (2005) entertains (277):

- (277) UG imposes a maximum of one interpretable syntactic feature per lexical or functional element.

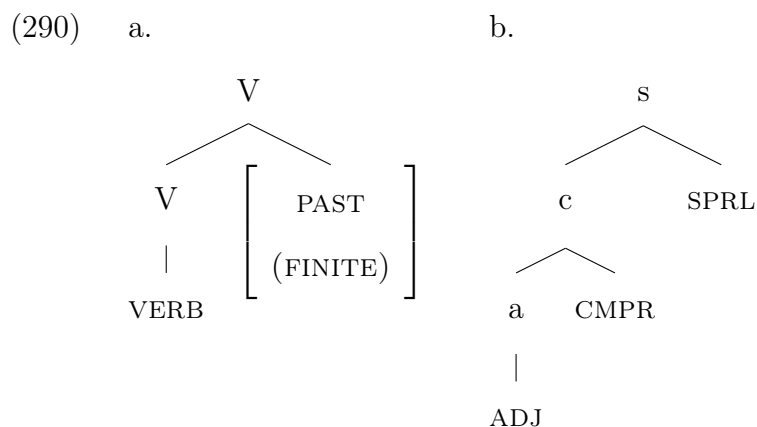
On both theory-internal and empirical grounds, I am led not to adopt this view, in favour of the more conservative perspective that the limit will be some (yet-to-be specified) measure of semantic complexity, rather than a narrow limit on syntactic features (interpretable or otherwise). Whether or not 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.

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 (289)):

- (289) 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 (224), repeated here as (290):



The structure of superlatives assigns each meaningful element to its own terminal node in the structure in (290b), and here, I hold that this should follow from the proper version of the Complexity Condition. 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 (290a) 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 (277), then (277) is overly restrictive in terms of the bundling it permits. In other words, if adjacency is the correct locality condition, we have a partial argument in favour of admitting feature bundling, as in (290a).

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.⁹

In addition to ablaut, some German strong verbs are subject to umlaut ($a \rightarrow \ddot{a}$, also $e \rightarrow ie$) in the second and third person singular of the present tense. The basic pattern is illustrated here, with *fahren* ‘to drive’:

(291)		PRESENT	
		SG	PL
	1	fahre	fahren
	2	fährst	fahrt
	3	fährt	fahren

As the paradigms illustrate, the conditioning environments for umlaut are defined morphosyntactically: [2 SG] and [3 SG]. 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 for person and number. But beyond person and number, 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 (222b)) 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):¹⁰

(292)		PRESENT		PRETERITE	
		SG	PL	SG	PL
	1	fahre	fahren	fuhr	fuhren
	2	fährst	fahrt	fuhrst	fuhrt
	3	fährt	fahren	fuhr	fuhren

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* com-

pare 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.

Approaching the empirical phenomena from the perspective of a formal Generative Typology (Baker and McCloskey 2007, Baker 2009), 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. Moreover, each additional theoretical assumption invoked yielded new predictions, which in turn revealed new generalizations (see in particular Chapters 3 and 5).

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 internal 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 the 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 the absence of unattested patterns: an adequate theory, it seems, must exclude unattested **good – better – goodest*; simply getting *good – better – best* 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 148 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.¹

The column headed CMPR TYP gives the type of comparative construction indicated in the descriptions consulted. The three main values in this column indicate the three types of comparative construction set out (with additional

examples) in section 1.4 (cf. Stassen 1985, 2008):

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:

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

CN 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:

- (294) tinuʔn λeŋu-ʔn-č č’eβuz-laχ-aʔn, a xaŋnaʔn qaʔm
these berry-PL-DIM sweet-ADJ-PL, but those not
‘These berries are sweeter than those.’ (Itelmen, field notes
[SB14A])

ST Standard comparative; the comparative is monoclausal, characterized by means of a particular morphosyntax for the standard of comparison, for example a *than*-phrase, as in English, or an oblique case marking (with or without marking of the property-denoting predicate, see below). Most Indo-European languages are of this sort:

- (295) Leo is tall-er than Mika.

Languages with multiple strategies are indicated with multiple values in this column. Since there are often many ways to paraphrase a comparative meaning, it is not clear how clear-cut the difference is between, say, ST and ST; CN. As little hinges on these labels, I have followed the descriptions that I relied on. Questionable classifications are marked with a question mark. The few languages marked OTH as the strategies 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.

PER 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’.²

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 (293) and (294) above). This type is also common among standard-comparative languages. Japanese is a language with no overt marking of comparison:

- (296) Sally-wa Bill-yori kasikoi
Sally-TOP Bill-FROM smart
‘Sally is smarter than Bill.’ (Beck et al. 2004, 327)

The values (M) and (PER) are used for languages in which an affixal or periphrastic expression is available, but described as optional. Udmurt illustrates an optional affix in (297) and Armenian an optional periphrastic marker (adverb) in (298).

- (297) kilometr iškem-leš vakči-(ges)
kilometer mile-ABL short-CMPR
‘A kilometer is shorter than a mile.’ (Winkler 2001, 40-41)
- (298) Artak-ə Bagrat-e-n (aveli) partsrahasag e
Artak-DEF Bagrat-ABL-DEF more tall BE.3SG.PRES
‘Artak is taller than Bagrat.’

Note that there is a blurry border between ZERO and (PER). The difference between Armenian, with an optional comparative adverb, and Japanese,

with unmarked comparatives, but an adverb/particle that may be used for reinforcement, seems likely to turn out to be an artefact of different descriptive traditions. Fortunately, nothing of substance here hinges on this classification.

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 *bolee* 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 B) has an optional comparative suffix *-rak* (Kangasmaa-Minn 1998, 237), 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 the relative superlative. Information was not available for many languages, and an *n/i* in this column indicates “no information (available)”. M and PER 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.³ Russian

illustrates (see section 3.2.3):

(299) Vanja vyš-e vse-x.

Vanja tall-er all-GEN.PL

‘Vanja is the tallest.’ (lit: ‘Vanja is taller than everyone.’)

CPR There is no clear morphosyntactic distinction between comparatives and superlatives.

DEF The superlative is derived from the comparative (or if that is zero, from the positive) by a marker of definiteness (or, in one case, a nominalizer with this function).

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).

POS The positive form of the adjective is used, with the superlative sense derived from context.

NONE Descriptions report that there is no fixed superlative construction.

OTH 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 identify morphological superlatives, as these are most relevant to the concerns

of this book. There is at least one other construction described as a means of forming superlatives that I have not included in this table. Namely, quite a few languages, in particular across southern and central Asia, are reported to express a superlative meaning by a construction roughly equivalent to English *whiter than white*, i.e., where the property predicate is compared to itself. Of the languages in this appendix, such a construction is indicated for Udmurt, Kashmiri, Burushaski, Tyvan, and Khakas (as well as in other Turkic languages and the Mongolic languages in the next appendix). Other than the Mongolic languages Dagur and Shira Yughur, this is never the only means of expressing superlatives indicated in the relevant sources.

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.

V There may be suppletive verbs replacing an ‘exceed’ comparative; see discussion at (27) in Chapter 1.

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. See discussion of this point in the next Appendix.

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Africa					
Tamashek	Afro-Asiatic, Berber	ST; 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)	ST; EX	ZERO	n/i	n/i
Qimant	Afro-Asiatic, Cushitic	ST	ZERO	ALL	n/i
Somali	Afro-Asiatic, Cushitic	ST	PER	PER	n/i
Arabic (Std.)	Afro-Asiatic, Semitic (Central)	ST	M	DEF	n/i
Neo-Aramaic	Afro-Asiatic, Semitic (Aramaic)	ST	(PER)	DEF	n/i
Hebrew	Afro-Asiatic, Semitic	ST	(PER)	PER	MORE
Khoekhoe (Nama)	Khoe (North Khoekhoe)	ST	ZERO	ALL	n/i
Khwe	Khoe (Kalahari)	ST; EX	ZERO	POS ⁴	n/i
Koromfe	Niger Congo, Gur	EX	ZERO	NONE	NO
Ijò	Niger-Congo, Ijoid	EX	ZERO	n/i	n/i
Kana	Niger-Congo, Benue-Congo	EX	ZERO	n/i	n/i

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Ogbronuagum	Niger-Congo, Benue-Congo	EX	ZERO	ALL	n/i
Banda	Niger-Congo, Volta-Congo	ST; EX	ZERO	ALL	n/i
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	PER	n/i
Koroboro Seno	Nilo-Saharan, Songhai	ST; EX	ZERO	ALL	n/i
Kanuri	Nilo-Saharan, W Saharan	ST; EX	(M)	ALL	n/i
Eurasia					
Irish	IE Celtic	ST	M	CPR	Y
Modern Greek	IE, Hellenic	ST	M	DEF	Y
Kashmiri	IE, Indo-Aryan (Dardic)	ST	ZERO	ALL	n/i ⁵
Persian (Farsi)	IE, Iranian (SW)	ST	M	M	Y

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Czech	IE, Slavic	ST	M	M	Y
Finnish	Uralic, Finno-Ugric	ST	M	M	YES
Udmurt	Uralic, Permian	ST	(M)	ALL	n/i
Nenets	Uralic, Samoyed	ST	M	M	?
Ket	Yeniseyan	ST	ZERO	PER; ALL	n/i
Even	Tungusic	ST	ZERO	ALL	n/i
Evenki	Tungusic	ST	M ?	M; ALL	n/i
Khalkha	Mongolian	ST	ZERO	ALL	n/i
Lezgian	Nakh-Dagestanian, Lezgie	ST	ZERO	ALL	MORE ?
Hunzib	Nakh-Dagestanian, Tsezic	ST	ZERO	ALL	n/i
Abkhaz	Northwest Caucasian	ST	ZERO	ALL	n/i
Bashkir	Turkic	ST	(M)	PER	n/i
Khakas	Turkic	ST	ZERO	PER;	n/i
Tyvan	Turkic	ST	(PER)	PER,	n/i
Itelmen	Chukotko-Kamchatkan	CN	ZERO	NONE	NO

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Chukchi	Chukotko-Kamchatkan	ST	M	M	n/i
Malayalam	Dravidian, Tamil	ST	ZERO ⁶	VERY; ALL	n/i
Ainu	NE Asia, isolate	ST; EX	(PER)	(PER)	n/i
Nivkh	NE Asia, isolate	ST	(M)	ABS/VERY? ⁷	n/i
Burushaski	S Asia, isolate	ST	ZERO	ALL	n/i
Yukagir	N Asia, isolate	ST	ZERO	ALL	n/i
Basque	Europe, isolate	ST	M	M	Y
ASL	Sign (American)	CN; ST	M	M	NO
E. Asia					
Cantonese	Sino-Tibetan, Chinese	EX	ZERO	PER	NO
Kunming	Sino-Tibetan, Chinese	ST; EX	(M)	(M)	n/i
Mandarin	Sino-Tibetan, Chinese	EX	ZERO	PER	NO
Dzongkha	Sin.-Tib., Tib.-Burman (Tibetan)	ST	ZERO	PER ?	n/i
Kham	Sin.-Tib., Tib.-Burman (Kham)	ST	ZERO	n/i	n/i
Limbu	Sin.-Tib., Tib.-Burm. (E. Kiranti)	ST	ZERO	ALL	n/i

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Newar (Dolokha)	Sin.-Tib., Tib.-Burm. (Newari)	ST	ZERO	ALL	n/i
Bisu	Sin.-Tib., Tib.-Burman (Ngwi)	ST	ZERO	n/i	NO
Mongsen Ao	Sin.-Tib., Tib.-Burm. (Naga)	CN; ST	M ⁸	VERY	n/i
Mizo	Sin.-Tib., Tib.-Burm. (Kuki-Chin)	ST	PER	PER	NO
Dumi	Sin.-Tib., Tib.-Burm. (W. Kiranti)	ST	ZERO	ALL	n/i
Lao	Tai-Kadai	ST; EX	ZERO	PER; ALL	n/i
Thai	Tai-Kadai	ST	PER	PER	n/i
Japanese	East Asia	ST	ZERO	(PER)	NO
Korean	East Asia	ST	(PER)	(PER)	NO
Pacific					
Mayali	Australian, Gunwingguan	CN; EX	ZERO	CPR	n/i
Nunggubuyu	Australian, Gunwingguan	CN	ZERO	NONE	NO?
Arrernte	Austr., Pama-Nyungan (Arandic)	ST	M	ALL	NO
Dyirbal	Austr., Pama-Nyungan (Dyribalic)	CN	M	n/i	n/i
Gumbaynggir	Austr., Pam-Nyu (Gumbainggiric)	CN; ST	M ⁹	M	n/i

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Walpiri	Austr., Pam-Nyu (South-West)	CN	ZERO	n/i	NO
Yindjibarndi	Austr., Pam-Nyu (South-West)	CN; ST	ZERO	NONE	n/i
Kayardild	Austr., Pam-Nyu (Tangkic)	CN; ST	ZERO	n/i	n/i
Jingulu	Australian, West Barkly	CN	ZERO	NONE	NO
Amis	Austronesian, E. Formosan	CN; EX	ZERO	PER	n/i
Paiwan	Austronesian, Paiwan	ST	M	M	n/i
Puyuma	Austronesian, Puyuma	ST ?	M	M?	n/i
Rukai	Austronesian, Rukai	ST ?	M	M	n/i
Seediq	Austronesian, Atayalic	EX	ZERO	CPR	n/i
Rapanui	Austronesian, Malayo-Polynesian (Oceanic, E. Nuclear Polynesian)	ST; EX	PER	ALL	n/i
Maori	Austronesian, Malayo-Polynesian (Oceanic, E. Nuclear Polynesian)	ST	PER	VERY	n/i
Muna	Austronesian, Malayo-Polynesian (Sulawesi - Munic)	ST	ZERO	n/i	n/i

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Pendau	Austronesian, Malayo-Polynesian (Sulawesi - Tomini)	ST	M	n/i	n/i
Yapese	Austronesian, Malayo-Polynesian (Oceanic, Yapese)	ST	ZERO	PER	n/i
Palauan	Austronesian, Malayo-Polynesian (Palauan)	ST	ZERO	n/i	n/i
Fijian (Boumaa)	Austronesian, Malayo-Polynesian (Oceanic, W. Fijian-Rotuman)	CN; ST	(PER)	n/i	n/i
Tuvaluan	Austronesian, Malayo-Polynesian (Oceanic, Samoic)	CN; ST; EX	PER	POS	n/i
Manam	Austronesian, Malayo-Polynesian (Oceanic, W. Oceanic)	CN	ZERO	n/i	n/i
Sinaugoro	Austronesian, Malayo-Polynesian (Oceanic, W. Oceanic)	ST	ZERO	ALL	n/i
Amele	Trans-New Guinea, Madang	EX; ST ?	PER ?	ALL	n/i

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Klon	Tr-New Guin., Timor-Alor-Pantor	ST	M	CPR	n/i
Teiwa	Tr-New Guin., Timor-Alor-Pantor	CN	PER	POS ¹⁰	n/i
Mian	Tr-New Guin., Central-W. (Ok)	CN	ZERO	PER ?	NO
Ekagi	Tr-New Guin., Central-W. (W. Bomberai)	CN	ZERO	ALL ¹¹	n/i
Koiari	Tr-New Guin., Eastern (Koiarian)	CN; EX	ZERO	NONE	n/i
Mauwake	Tr-New Guin., Adelbert Range	CN; EX	ZERO	ALL	n/i
Arapesh	PNG Torricelli	ST ?	PER	NONE	n/i
Skou	Papuan	CN	ZERO	ZERO/NONE	n/i
Mundari	Austro-Asiatic, Munda (North)	ST	ZERO	ALL	n/i
Santali	Austro-Asiatic, Munda (North)	ST	(PER)	ALL	n/i
Remo	Austro-Asiatic, Munda (South)	ST	ZERO	ALL	n/i
Semalai	Aust-Asia, Mon Khmer (Aslian)	CN; ST	M	n/i	NO
Palaung	Aust-Asia, Mon Khmer (N.)	ST	ZERO ?	ALL	n/i

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Vietnamese	Aust-Asia, Mon Khm. (Viet-Muong)	EX	ZERO	OTH ¹²	n/i
Khmer	Aust-Asia, Mon Khm. (E., Khmer)	ST	PER	PER	n/i
Sapuan	Aust-Asia, Mon Khm. (E., Bahnaric)	ST	ZERO	PER	n/i
Americas					
Aleut	Eskimo-Aleut	ST	ZERO	n/i	n/i
West Greenlandic	Eskimo-Aleut	ST	M	CPR	n/i
Straits Salish	Salishan	CN	ZERO	NONE	n/i
Navajo	Na-Dene, Athapaskan	ST	M	M + PER	n/i
Nishnaabemwin	Algic, Algonquian	ST	PER	NONE	n/i
Cherokee	Iroquoian	ST	M	M	n/i
Kiowa	Kiowa Tanoan	ST	ZERO	CPR; ALL	NO
Chimariko	isolate (Hokan?)	ST?	M	M	n/i ¹³
Kiliwa	Yuman (Hokan)	CN?	M ¹⁴	n/i	n/i

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Choctaw	Muskogean	EX	ZERO	n/i	n/i
Crow	Siouan	OTH ¹⁵	M ?	n/i	n/i
Wappo	Yukian	ST	ZERO	PER	n/i
Nahuatl	Uto-Aztecan, Nawan	ST	PER	NONE	n/i
Comanche	Uto-Aztecan, Numic	ST	ZERO ?	NONE	n/i
Tumpisa Soshone	Uto-Aztecan, Numic	ST	ZERO	ALL	NO
Cupeño	Uto-Aztecan, Takic	EX; ST	(PER)	(ALL)	n/i ¹⁶
Sonora Yaqui	Uto-Aztecan, Sonoran	ST	PER	ALL	n/i
Tohono O'odham	Uto-Aztecan, Sonoran	ST	PER	VERY	n/i
Tarascan	N. Amer, isolate	OTH	M ?	n/i	n/i
Totonac	N. Amer, isolate	ST	PER	CPR; ALL	n/i
Miskitu	Misumalpan	CN	(PER)	ABS	n/i
Mixtec	Oto-Manguean	CN; ST	M	DEF ¹⁷	NO ?
Wari'	Chapacuran	CN	ZERO	n/i	n/i
Yagua	Peba-Yaguan	CN; EX	ZERO	n/i	n/i

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Bare	Arawakan, N. (Central Upper Amazonian)	ST	(PER)	n/i	n/i
Tariana	Arawakan, N. (Eastern Nawiki)	ST; EX	M	PER	n/i
Warekena	Arawakan, N. (Western Nawiki)	CN	ZERO	n/i	n/i
Paumarí	Arawan	CN;	ZERO ¹⁸	n/i	n/i
Apalai	Carib	CN; ST	ZERO	n/i	n/i
Hixkaryana	Carib	CN; OTH ¹⁹	ZERO	n/i	n/i
Bororo	Bororoan (Macro-Ge ?)	ST	ZERO	n/i	n/i
Kayapó	Jêan (Macro-Ge ?)	CN	ZERO	ABS	n/i
Pirahã	Muran	CN	ZERO	n/i	n/i
Mbyá (Guaraní)	Tupi-Guarani (Guaraní)	ST	M	ALL	NO
Urubu-Kaapor	Tupi-Guarani (Tupi)	CN; EX	ZERO	n/i	n/i
Andoke	S. Amer, isolate	ST	ZERO	ABS (PER)	n/i
Aymara	S. Amer, isolate	ST; EX	PER	PER, ALL	n/i
Mapuche	S. Amer, isolate	ST	PER	ALL ?	

LANGUAGE	LINEAGE	CMPR TYP	CMPR	SPRL	SUPPL
Mosetén	S. Amer, isolate	CN	ZERO	ABS	n/i
Urarina	S. Amer, isolate	EX	ZERO	ALL	n/i
Kwaza	S. Amer, isolate	CN ?	ZERO	NONE	n/i

Appendix B

The Focussed Survey

The following reports on the second stage of the database construction. The columns and headings are as described in the previous appendix. 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 (and listed only half of those surveyed here). Similar remarks hold of Indo-Aryan, where there appears to be strikingly little variation across the modern languages in how comparatives and superlatives are formed, and thus only a representative set of languages

is given here. On the other hand, there are languages in this table (such as Vlach Romani) in which there is a single table entry, but substantial variation among dialects (see Chapter 3). Despite a certain arbitrariness in divisions, then, in all, this survey has entries for 174 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 302 languages are reported on here.

The aim of this telescoping was to construct a listing of languages with the potential for suppletive superlatives that is as comprehensive as possible. Nevertheless, coverage remains 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 4.3); I find it implausible to suppose that the phenomenon exists in languages of this type, but by coincidence only where it happens to have escaped notice.

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
Indo-European				
Albanian	Albanian	PER	PER	NO
Hittite	Anatolian	ZERO	n/i	n/i ¹
Tocharian	Tocharian	ZERO?	n/i	n/i
Armenian (Classical)	Armenian	(M)	ALL, CPR	Y
Armenian Middle	Armenian	PER	DEF	n/i
Armenian Western	Armenian	(PER)	PER; M; ALL	Y
Armenian Eastern	Armenian	PER	PER, 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 ²	M	Y
Czech	Slavic	M	M	Y
Macedonian	Slavic	M ³	M	Y

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
Polish	Slavic	M	M	Y
Russian	Slavic	M	M	Y
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	CPR	Y
Manx	Celtic	M	CPR	Y
Scottish Gaelic	Celtic	M	CPR	Y
Welsh	Celtic	M	M	Y
Latin	Romance	M	M	Y
Catalan	Romance	PER	PER	Y

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
French (Old)	Romance	M	PER	Y
French (Modern)	Romance	PER	PER	Y
Italian	Romance	PER	PER	Y
Portuguese	Romance	PER	PER	Y
Romanian	Romance	PER	PER	NO
Spanish	Romance	PER	PER	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

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
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	ALL	Y ⁴
Kashmiri	Indo-Aryan	ZERO	ALL	? ⁵
Marathi	Indo-Aryan	ZERO	ALL	n/i ⁶
Nepali	Indo-Aryan	ZERO	ALL	n/i
Sinhalese	Indo-Aryan	PER	PER	n/i

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
Romani	Indo-Aryan	M	PER	n/i
Romani (Vlach)	Indo-Aryan	PER	DEF ⁷	Y ⁸
Persian (Old)	Iranian	M	M	Y ⁹
Persian (Middle)	Iranian	M	M	Y
Sogdian	Iranian	M	PER	n/i
Khotanese (Gyāz̄dian)	Iranian	M	M	Y
Balochi	Iranian	M	M,ALL ¹⁰	n/i
Gilyan	Iranian	M	ALL	Y
Kurdish, Kurmanji	Iranian	M	CPR, PER	Y
Kurdish, Sorani	Iranian	M	M	n/i
Ossetian	Iranian	M	ALL, PER	Y
Pashto	Iranian	ZERO	ALL, VERY	n/i
Persian (Farsi)	Iranian	M	M	Y
Shughni-Rushan	Iranian	M	ALL	n/i
Tajik	Iranian	(M)	M; ALL	Y

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
Talysh	Iranian	ZERO	PER	n/i
Tat	Iranian	M	M	n/i
Wakhi	Iranian	(M)	ALL	n/i
Yagnobi	Iranian	ZERO ¹¹	ALL	n/i
Zazaki	Iranian	ZERO	ZERO	n/i
Uralic				
Estonian	Fennic	M	M, ALL	YES
Finnish	Fennic	M	M	YES
Ingrian	Fennic		ALL	n/i
Karelian	Fennic	M	M, ALL ¹²	YES
Livonian	Fennic	M	ALL, PER, DEF	n/i
Lude	Fennic	M	ALL	n/i
Veps	Fennic	M	PER, ALL	YES
Votic	Fennic	M	PER, ALL	YES
Saami (North)	Saamic	M	M	n/i

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
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)	PER	n/i
Mari (Cheremis)	Mari	(M)	PER	n/i
Mordva	Mordvin	ZERO	PER, ALL	n/i
Komi	Permian	M	PER	n/i
Udmurt	Permian	(M)	ALL	n/i
Nenets (Yurak)	Samoyed	M	M; ALL	n/i
Nganasan (Tavgy)	Samoyed	M? ¹³	n/i	? ¹⁴
Selkup	Samoyed	ZERO	PER	n/i
Altaic				
Even	Tungusic	ZERO	ALL	n/i
Evenki	Tungusic	M (?)	M; ALL	n/i

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
Manchu	Tungusic	ZERO	n/i	n/i
Nanai	Tungusic	ZERO	ALL ?	n/i
Negidal	Tungusic	(M)	(M)	n/i
Orochi	Tungusic	ZERO	PER	n/i
Orok	Tungusic	(M)	ALL; VERY	n/i
Ulch	Tungusic	ZERO	PER	n/i
Azeri	Turkic	(PER)	PER	n/i
Bashkir	Turkic	(M)	PER	n/i
Chuvash	Turkic	(M)	PER; ALL	n/i
Gagauz	Turkic	PER	PER	n/i
Karachay-Balkar	Turkic	(M)	PER	n/i
Karaim	Turkic	M	PER	n/i
Kazakh	Turkic	M	PER	n/i
Khakas	Turkic	ZERO	PER	n/i ¹⁵
Kirghiz	Turkic	(M)	PER	n/i

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
Kumyk	Turkic	PER	PER	n/i
Nogai	Turkic	ZERO	PER	n/i
Shor	Turkic	ZERO	PER	n/i
Tatar	Turkic	(M)	PER	Y
Turkish	Turkic	(PER)	N	N
Turkic, Old	Turkic	M	PER	Y? ¹⁶
Turkmen	Turkic	ZERO ?	ABS	n/i
Tyvan	Turkic	ZERO	PER	n/i
Uyghur	Turkic	M	PER	n/i
Uzbek	Turkic	(M)	PER	n/i
Bonan	Mongolian	ZERO	n/i	n/i
Buryat	Mongolian	ZERO	VERY	n/i
Dagur	Mongolian	ZERO	¹⁷	n/i
Kalmyk	Mongolian	ZERO	PER	n/i
Khalkha	Mongolian	ZERO	ALL	n/i

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
Moghol	Mongolian	M ¹⁸	M	n/i
Mongghul	Mongolian	ZERO	n/i	n/i
Oirat	Mongolian	ZERO	n/i	n/i
Ordos	Mongolian	ZERO	n/i	n/i
Santa	Mongolian	ZERO	n/i	n/i
Shira Yughur	Mongolian	ZERO	¹⁹	n/i
Yeniseian				
Ket	Yeniseian	ZERO	ALL	n/i
Kott	Yeniseian	ZERO	CPR; ALL	Y? ²⁰
Yugh	Yeniseian	(M)	ALL	n/i ²¹
Chukotko-Kamchatkan				
Itelmen	Chukotko-Kamchatkan	ZERO	n/i	NONE ²²
Alutor	Chukotko-Kamchatkan	ZERO	M	n/i
Chukchi	Chukotko-Kamchatkan	M	M	n/i
Kerek	Chukotko-Kamchatkan	M	M	n/i

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
Koryak	Chukotko-Kamchatkan	M	M	n/i
Kartvelian				
Georgian	Kartvelian	M	M	Y
Mingrelian	Kartvelian	M	PEIPRH	Y
Laz (Chan)	Kartvelian	ZERO	ALL	n/i ²³
Svan	Kartvelian	M	M	Y
NW Caucasian				
Abaza	NW Caucasian	PER	n/i	Y
Abkhaz	NW Caucasian	(PER)	ALL	Y
Adyghe	NW Caucasian	M? ²⁴	PER	n/i
Kabardian	NW Caucasian	M?	PER	Y? ²⁵
Ubykh	NW Caucasian	M	M	n/i
Nakh-Dagestanian				
Chechen	Nakh	(M)	PER	n/i
Ingush	Nakh	M	PER	n/i

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
Batsbi	Nakh	M	M	n/i
Avar	Dagestanian	ZERO	PER	n/i
Andi	Dagestanian	ZERO	n/i	n/i
Botlkh	Dagestanian	ZERO	n/i	n/i
Bagvalal	Dagestanian	ZERO	n/i	n/i
Tsez	Dagestanian	ZERO	n/i	n/i
Hunzib	Dagestanian	ZERO	ALL	n/i
Lezgian	Dagestanian	ZERO	ALL	Y? ²⁶
Tabasaran	Dagestanian	ZERO	ALL	n/i
Semitic				
Amharic	Afro-Asiatic, Semitic	ZERO	ALL	n/i
Arabic, Standard	Afro-Asiatic, Semitic	M	DEF	n/i
Arabic Gulf	Afro-Asiatic, Semitic	M	DEF	n/i
Arabic, Moroccan	Afro-Asiatic, Semitic	M	POS/DEF ²⁷	n/i
Assyrian Neo-Aramaic	Afro-Asiatic, Semitic	(PER)	DEF	n/i

LANGUAGE	LINEAGE	CMPR	SPRL	SUPPL
Hebrew, Biblical	Afro-Asiatic, Semitic	ZERO	ALL; DEF	n/i
Hebrew, Modern	Afro-Asiatic, Semitic	(PER)	PER	Y
Maltese	Afro-Asiatic, Semitic	M	DEF	n/i

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), L. Kamandulytė (Lithuanian), R. Pancheva (Bulgarian), P. Caha, I. Kučerová, H. Skoumalova (Czech), S. Dyla, P. Jabłonska (Polish), Zh. Glushan, N. Fitzgibbons, N. Radkevich, O. Tarasenkova (Russian), Ž. Bošković, M. Despić, M. Marelj (Serbo-Croatian), A. Harrison (Slovenian), N. Kariaeva, H. Koulidobrova (Ukrainian), R. Feldstein (Old Church Slavonic), A. Carnie (Irish), J. Phillips, E. Pyatt (Welsh), D. Adger (Scottish Gaelic), A. Calabrese (Italian), P. Schlenker (French), S. Herdan (Romanian), C. Buesa-García (Spanish), I. Oltra Massuet (Catalan), 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), J. G. Jónsson (Icelandic), R. Bhatt (Hindi), B. Hettich (Ossetian), A. Kahnemuyipour, I. Cagri (Persian) I. Laka, G. Rebuschi (Basque), L. Nash (Georgian), M. Kelepir, N. Şener, S. Şener (Turkish), M. Erdal (Old Turkish), Y. Sharvit (Hebrew), P. Kiparsky (Finnish), G. M. Alekseev, N. Antropova, N. Bukina, E. Filipova, M. V. Matveena, P. M. Zajkov, Zh. Glushan (Karelian), A. Szabolcsi, K. Szendrői (Hungarian), F. Mc Laughlin (Wolof), C. Creider, J. T. Creider (Nandi, Swahili), J. Rennison (Koromfe), C. Armer (Cherokee), D. Harbour (Kiowa), A. R. Deal (Nez Perce), M. Macauley (Mixtec), G. Thomas (Mbyá, Tupi-Guaraní), I.-T. C. Hsieh (Mandarin), I. Chung (Korean), D. Lillo-Martin (ASL), D. Nash, J. Simpson (Warlpiri), and 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)
Niger-Congo	
Banda	Tisserant (1930)
Fulfulde	Taylor (1921), Labouret (1952)
Ijò	Williamson (1965)
Kana	Ikoro (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 Ambrazas (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), <i>Oxford English Dictionary (OED)</i> (online) http://www.oed.com
Faroese	Thráinsson et al. (2004)
Frisian	Tiersma (1985)
German	Grimm and Grimm (1854-1961), <i>Das Digitale Wörterbuch der deutschen Sprache des 20. Jh. (DWDS)</i> and <i>Wörterbuch der deutschen Gegenwartssprache (WDG)</i> both at: http://www.dwds.de
German (Cimbrian)	Schweizer (2008)
Icelandic	Einarsson (1945), Hólmarsson et al. (1989)
Norwegian	Kirkeby (1989), Strandskogen and Strandskogen (1986)
Swedish	Holmes and Hinchcliffe (2003), Prisma (1995), <i>Svenska Akademiens ordbok (SAOD)</i> http://g3.spraakdata.gu.se/saob/
Yiddish	Weinreich (1984), Jacobs (2005)

Indo-Iranian

Sanskrit	Bopp (1856), Debrunner and Wackernagel (1929)
Bagri	Gusain (2000)
Hindi	McGregor (1972), Kachru (2006)
Kashmiri	Wali and Koul (1997)
Marathi	Pandharipande (1997)
Nepali	Acharya (1991)
Sinhalese	Garusinghe (1962)
Romani	Weigand (1888), Pobożniak (1964), Gołąb (1984), Katsánis and Dínas (1990), Hancock (1995), Ma- tras (2002)
Persian (Old)	Kent (1953), Branenstein and Mayrhofer (1964), Skjærvø (2009b)
Persian (Middle)	Skjærvø (2009a)
Sogdian	Yoshida (2009)
Khotanese (Gyāz̄dian)	Emmerick (2009)
Balochi	Rastorgueva (1966), Jahani and Korn (2009)
Gilyan	Rastorgueva et al. (1971)
Kurdish	Bakaev (1966), Thackston (2006b,a)
Ossetian	Abaev (1964), Isaev (1966), Hettich (2010)
Pashto	Tegey and Robson (1996), Robson and Tegey (2009)

Persian (Farsi)	Hayyim (1934-1936), Mace (2003), Windfuhr and Perry (2009)
Shughni-rushnan	Sokolova (1966), Edelman and Dodykhudoeva (2009)
Tajik	Rastorgueva (1963), Windfuhr and Perry (2009)
Talysh	Pirejko (1966), Schulze (2000)
Tat	Grjunberg (1966)
Wakhi	Pakhalina (1966), Bashir (2009)
Yagnobi	Khromov (1972)
Zazaki	Paul (2009)
Romance	
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)
Slavic	
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)

Other Indo-European

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)
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)

Uralic (Finno-Ugric, Samoyedic)

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), Helinski (1998b)
Udmurt (Votyak)	Tepljashina (1966), Csúcs (1998), Winkler (2001)
Veps	Zajtseva (1981), Nau (1992)
Votic	Ariste (1968), Nau (1992)
Tungusic	
Even	Benzing (1955), Malchukov (1995)
Evenki	Nedjlov (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)
Yeniseian	
Ket	Castrén (1858), Vall and Kanakin (1990), Werner (1997c), Vajda (2004)
Kott	Castrén (1858), Werner (1997a)

Yugh	Castrén (1858), Werner (1997b)
Chukotko-Kamchatkan	
Itelmen	Bogoras (1922), Volodin (1976), and field notes
Alutor	Zhukova (1968a), Nagayama (2003)
Chukchi	Bogoras (1922), Skorik (1961, 1977)
Kerek	Skorik (1968)
Koryak	Zhukova (1968b, 1972)
Turkic	
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)
Mongolic	
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)
Kartvelian	
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)

NW Caucasian

Abaza Lomtadze (1967a), Tabulova (1976), O’Herin
(1995)

Abkhaz Aristava et al. (1968), Chirikba (2003), Hewitt
and Khiba (1979), Hewitt (1991), Lomtadze
(1967b)

Adyghe Jakovlev and Ashxamaf (1941), Rogava and Kera-
sheva (1966), Kumakhov (1967)

Kabardian Shagirov (1967), Colarusso (1992)

Ubykh Dumézil (1931)

Nakh-Dagestanian

Chechen Desheriev (1967b), Nichols (n.d.)

Ingush Dolakova (1967), Nichols (2011)

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)
Dravidian	
Dravidian (general)	Steever (1998a), Krishnamurti (2003)
Malayalam	Asher and Kumari (1997)
Eurasia: Isolates	
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

Sino-Tibetan

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)
Mizo (Lúshái)	Shaha (1884)
Dumi	van Driem (1993)
Tai-Kadai	
Lao	Morev et al. (1972), Enfield (2007)
Thai	Iwasaki and Ingkaphirom (2005)
Other	
Japanese	Martin (2004), Beck et al. (2004), Oda (2008)
Korean	Lukoff (1993), Underwood (1914)

AUSTRALIA AND PACIFIC

Australian

Mayali (Bininj Gun-
wok) 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. (1986a)
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 Guinea

Amele	Roberts (1987)
Klon	Baird (2008)
Teiwa	Klamer (2010)
Mian	Fedden (2007)
Ekagi	Drabbe (1952)
Koiari	Dutton (2003)
Mauwake	Berghäll (2010)
Arapesh	Fortune (1942)
Skou	Donohue (2004)

Austro-Asiatic

Semalai	Kruspe (2004)
Vietnamese	Thompson (1987)
Khmer	Huffman (1970)
Sapuan	Jacq and Sidwell (1999)
Palaung	Milne (1921)
Santali	Neukom (2001)
Remo	Fernandez (1967)

AMERICA

North America

Aleut	Bergsland (1997)
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)
Chimariko	Jany (2009)
Kiliwa	Mixco (2000)
Choctaw	Nicklas (1979), Broadwell (2006)
Crow	Graczyk (2007)
Wappo	Thompson et al. (2006)
Nahuatl (Classical)	Andrews (1975)
Comanche	Charney (1993)
Tumpisa Soshone	Dayley (1989)
Cupeño	Hill (2005)
Sonora Yaqui	Dedrick and Casad (1999)
Tohono O'odham (Papago)	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'	Everett and Kern (1997)
Yagua	Payne and Payne (1990)
Bare	Aikhenvald (1995)
Tariana	Aikhenvald (2003)
Warekena	Aikhenvald (1998)
Paumarí	Chapman and Derbyshire (1991)
Apalai	Koehn and Koehn (1986)
Hixkaryana	Derbyshire (1985)
Bororo	Crowell (1979)
Kayapó	Sala (1914)
Pirahã	Everett (1986)
Mbyá (Guaraní)	Pederson (1977)
Urubu-Kaapor	Kakumasu (1986)
Andoke	Landaburu (1979)
Aymara	Inojosa (1966)
Mapudungun	Zuñiga (2006), Smeets (2007)

Mosetén	Sakel (2004)
Urarina	Olawsky (2006)
Kwaza	van der Voort (2004)

Notes

¹Not 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.

²As is often the case, there is some degree of inconsistency in the use of these terms in the literature. Some (for example, Hackl 2009) use the terms ‘relative’ and ‘absolute’ superlative not in the sense just indicated, but rather to refer to two different readings of the (relative) superlative, namely those termed the ‘comparative’ and ‘absolute’ readings elsewhere.

³This 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 to hold.

⁴For differing views on this point within DM, see Embick (2010, 193, n1) and Marantz (1996, 2007).

⁵Compare 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.

⁶See 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.

⁷Marantz (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: $[X [Y \dots]] \rightarrow [X+Y \dots]$, and the affixation of a head X to the head of its complement, as in affix-hopping: $[X [_{YP} Y]] \rightarrow [_{YP} X+Y]$. 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.

⁸This is a matter of ongoing debate, see Bonet and Harbour (To appear),

Embick (2010) for current discussion.

⁹Embick (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.

¹⁰A 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 section 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).

¹¹The 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 *Ethnologue* 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 remains essentially constant between the full 109

languages, and the 42 large languages, with standard comparatives outnumbering exceed comparatives by roughly $3\frac{1}{2}:1$.

¹²For 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.

¹³An 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 watʃu tu puʃi
 big SUBJ dog OBJ cat
 ‘The dog is bigger than the cat.’ (He et al. 1986b, 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 1990, 189-199). 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-like 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. 1986b.)

In Purepecha (Tarascan), as described in Foster (1969, 126-128) a transitive morpheme *-ku-* (which has a variety of functions) may be added to a verbalized adjective to yield a comparative, with the standard expressed as 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*.

¹⁴But 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 Dyirbal. 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
 ‘He’s big [but] I’m bigger.’

Dixon (1977, 245) reports a similar pattern for the affix *-waɖan* in Yidj, though notes that it is also used as a marker of emphasis, glossable as ‘very’.

¹⁵This was first drawn to my attention by F. Mc Laughlin.

¹⁶Intrinsically comparative verbs for some adjectival meanings are also reported for Mayali (Evans 2003, 569-570).

¹For 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.

²Ultan suggested that the generalization represents 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. 23 below.)

³Here and throughout, diagrams represent stems to which inflectional morphology may be added. The comparative embeds the positive stem (or base), minus inflectional morphology.

⁴The 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 (2008, 2011c) for a proposal regarding variation in the structure of infinitival complements, and Radkevich (2010) on PP structure.

⁵Note also that I must reject a POS morpheme in the positive, a morpheme that, although not clearly manifest in overt morphology in any known lan-

guage, is an important component of some semantic treatments; see Kennedy 2007b. I return to this question in section 4.2, below.

⁶Here 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.

⁷Note 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 (45a) 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.

⁸My thanks to Jessica Rett for this observation.

⁹I 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

(50a), 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).

¹⁰In 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, involving comparison and universal quantification over the standard, would exceed that threshold, and would thus necessarily be bi-morphemic.

¹¹A 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.

¹²That 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 (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. See section 4.1.

¹³The 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.

¹⁴Superlatives for (55c,f) were not given in the sources from which these were taken, but the sources indicates superlatives formed by *naj-* prefixation to the comparative.

¹⁵That 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).

¹⁶The most extensive 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 one that does not affect the point made here, namely, that there is variation within Slavic.

¹A reviewer points out that the examples in (60e-h) support the Containment Hypothesis if their structure is [SPRL [X CMPR]] but that they are also superficially consistent with an alternative parse: [[SPRL X] CMPR]. Note that for none of these is there any compelling evidence (that I am aware of) for the alternative parse. For example, in all cases, the smaller constituent [X CMPR] surfaces as the comparative, but a putative intermediate [SPRL X] is ill-formed (notwithstanding the remark on Hungarian

locative adverbs in n. 4).

²Note 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 his 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).

³Various 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 comparatives and superlatives in their historical context.

⁴The prefix *leg-* attaches to spatial adverbs without a comparative suffix, to form pairs such as *alsó* – *leg-alsó* ‘down’ – ‘bottommost’. 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 (60), thus compare: *náj-nagy-obb* ‘biggest’ to the standard Hungarian forms just cited.

⁵The 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) rùʔù sùkú=ka=rí asù roʔo

I tall=ADD=1 than you

‘I am taller than you.’

(ii) roʔo kúu xa-náxini=ka

you COP NOM-drunk=ADD

‘You are the drunkest.’ (Macaulay 1996, 162-164)

⁶I 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.

⁷The 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).

⁸In this variety, the definite article cliticizes to the adjective: *buṇu* – *cama buṇu* – *cama bun-lu* ‘good – more good – more good-the’; my thanks to Jason Merchant for the pointer to this variety.

⁹Original: “Die Setzung oder Nichtsetzung des Artikels dürfte nicht zur

Unterscheidung der beiden Steigerungsstufen (wie teilweise in romanischen Sprachen) dienen...”

¹⁰This 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.

¹¹The 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 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). A blurry boundary between a relativizing and a comparative function is also seen in Turkic *-raχ*. 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.

¹²These 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).

¹³Such structures could be base generated or derived from (67) 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).

¹⁴I treat the alternation *pare-* ~ *parha-* as irregular, and not suppletive.

¹⁵The 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.

¹⁶An apparently similar construction exists in Lithuanian, with the element *-él-* 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 above cannot be tested in that language.

¹⁷The 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 (60) 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.

¹⁸Though 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.

¹⁹The tripartite pattern in (74b) 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-yj xoroš-ij* is possible alongside (74b).

²⁰A superlative suffix *-tku* is also possible in place of *-tmer*. Bulatova and Grenoble (1999, 21) also give a form with just the bare adjective. Bulatova and Grenoble state that the *-tku* form is the superlative, while the comparative consisting of the positive form with the universal quantifier forms “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 (75d) to the example from related Even in (76a), in which the suffix (evidently cognate to the Evenki comparative marker) 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.

²¹Searched July 2010.

²²This 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).

²³Compare also Lao, which forms a superlative with a word glossed ‘peer, (member of) group’ in the comparative construction, which is etymologically, at least, an ‘exceed’-type (Enfield 2007, 257).

²⁴I put aside here the many interesting questions of the syntax of comparatives (including the question of whether CMPR resides in a DEGP for example), 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. Note that I also ignore throughout the difference between clausal (*Leo is taller than [IP Talia is]*) and phrasal (*Leo is taller than [DP Talia]*) comparatives. My own sample confirms the observation in Bhatt and Takahashi (2008) that no language uses distinct degree markers (*-er, more*) for the two types of comparative; where languages do draw a morphosyntactic distinction between clausal and phrasal comparison, the distinction is always internal to the marking of the standard (*than* and its complement); see Bhatt and Takahashi (2008), Merchant (2009) on Hindi-Urdu and Japanese and Greek, respectively.

²⁵These forms are from Aristava et al. (1968, 49-50), see also Chirikba (2003, 30) (the superlative is from Hewitt 1991, 47); the morphological alternations on the adjective 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.

²⁶The Late Latin examples are from Cuzzolin and Lehmann (2004, 1217) and the Greek from González-Díaz (2006, 726) and Holton et al. (1997, 87).

²⁷For 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 (September 2010), yet some speakers report it as entirely unacceptable (P. Schlenker, personal communication, 2010).

²⁸An 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 and Aristava et al. 1968, 49-50).

²⁹We 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 difference among frameworks in representing the core idea of their approach in the main text.

³⁰Compare also the non-suppletive periphrastic form for ‘most’ in Ludian Karelian in (173c).

³¹I have replaced Votic with related Veps in (107) 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 and there is no reason to suspect an irregularity here.

³²In theory, this should play out internal to a single language, if (i) the language has different strategies 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. 37. However, the only root that undergoes suppletion in the comparative (*biræ – fil-dæx* ‘many – more’) forms superlatives with elements that embed the comparative, as in *æppætu fildæx*, and does not combine with (positive-embedding) *iuul*. My thanks to B. Hettich for the Ossetian data and discussion thereof.

³³As noted elsewhere, Greenberg (1966), Canger (1966), Ultan (1972) propose the markedness hierarchy positive < comparative < superlative, which may imply the inventory universal in (89), although the authors cited do not note or explore this implication.

³⁴Bobaljik (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 such as (110) must be achieved by Morphological Merger, rather than by syntactic head movement. See also Embick and Noyer (1999) for related discussion.

³⁵The particle *-ma* appears to be a clitic, sometimes written together with its host and sometimes not. Superlatives may also be formed without *váḍā*, in which case the particle follows the adjective; the particle may also follow the noun in some contexts.

³⁶Hewitt (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.

³⁷The 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.

³⁸The locality condition in (90) 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.

³⁹An 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. | xoroš-ij | luč-še | samyj xoroš-ij | ‘good’ |
| b. | | luč-š-ij | samyj luč-š-ij | |

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 (123d) 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.

⁴⁰For 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), my thanks to I.-T. C. Hsieh.

⁴¹Oda (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 comparative in Japanese, see the response to Beck et al. (2004) in Hayashishita (2009)

⁴²Although 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 problematic, 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.

⁴³A rather complex, but much-discussed example of this sort involves apparent scope interactions between the comparative operator and modals, and is given in (i), from Heim (2000).

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

The second sentence is ambiguous as regards the length requirement. One reading holds that the final paper must be exactly 15 pages long; neither longer nor shorter papers will be accepted. In this reading, the requirement is that the paper be [exactly 5 pages longer than 10 pages].

The other reading is somewhat more subtle, but holds that the requirement is a minimum of 15 pages, but is consistent with longer papers being accepted. For this reading, the logical paraphrases given by Heim and others take the *exactly* and the comparative part to scope above the (operator in) the word *required*. The (minimum) requirement is 15 pages, and 15 is exactly 5 pages longer than 10.

Preliminary investigation suggests that even in such cases, Armenian patterns with English in the readings allowed, to the extent that (ii.b) is also ambiguous, even without *aveli*, in the same way as English (i) is.

- (ii) 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
 final article-DEF must-be exactly five page-ABL-DEF more
 əlla
 BE.3.SG
 ‘The final paper must be exactly 5 pages longer than that.’

⁴⁴One further examples in (one variety of) Vlach Romani, is discussed in n. 29 in Chapter 4.

⁴⁵This does leave a residue of recalcitrant cases, such as *winningest* versus **winner (than)*, which does appear to have a relative superlative (but no comparative) 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).

⁴⁶I am indebted to Jon Gajewski and Chris Hsieh for helpful discussions of the semantics discussed in this section.

⁴⁷Although note that there are theories of the comparative that formally assign it a meaning like (131), 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 paraphrase two of the major types of overt comparison in the worlds’ languages (Stassen 1985, 2008), namely the ‘exceed’ (i) and conjoined (ii) types:

(i) Uqa cecela. Uqa ija wol-te-na. (Amele, Tr-N-Guinea)

3SG long 3SG 1SG surpass-1SG-3SG-PRES

‘He is taller than me.’ (Roberts 1987, 91)

(ii) a’e puku, ne anī (Urubu-Kaapor, Tupi-Guaraní)

he long you no

‘He is taller than you.’ (Kakumasu 1986, 346)

⁴⁸Whether Czech *pře-* includes an ‘excessive’ meaning is perhaps debatable, but the same behavior characterizes the Slovenian cognate *pre-* which

is explicitly excessive (Herrity 2000).

⁴⁹For the reader familiar with Hackl (2009), note that his use of the terms ‘relative’ and ‘absolute’ superlative is distinct from how those terms are used here; see n. 2 of Chapter 1.

⁵⁰Very 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.

⁵¹Plausible meanings could be assigned to the superlative examples. Thus, (136) 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 (137): ‘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
what.ADESS more-ACC you.read that.ADESS more-ACC

{meg-értesz / értesz meg}

VM-you.understand you.understand VM

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

- b. *Minél leg-több-et olvasol, annál
 what.ADESS SPRL-more-ACC you.read that-ADESS
 leg-több-et {meg-értesz / értesz meg}
 SPRL-more-ACC VM-you.understand you.understand VM

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

²The 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.

³Comparative 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.

⁴See note 14 below.

⁵The adjective *k’argi-i* formed a regular (non-suppletive) comparative in Old Georgian (Fährich 1991).

⁶Gudjedjani 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.

⁷This suppletive comparative pattern is retained for ‘bad’ in Modern

Greek, but the superlative is periphrastic.

⁸Additional doublets are given in some sources.

⁹This form is possibly irregular, rather than suppletive.

¹⁰For Old Persian, Kent (1953) and Skjærvø (2009b) give superlative *maθ-išta* as a suppletive form corresponding to *vazarka* ‘great’. No source gives a corresponding comparative for Old Persian; to judge by Branenstein and Mayrhofer (1964, 64-65), the surviving Old Persian materials provide only limited evidence of adjectival gradation, and the comparative for ‘great’ is not among the attested forms.

¹¹*Smā* is a suppletive plural for singular *lille*.

¹²The forms for small are given in Skjærvø (2009a, 206) in a list of suppletive forms, separately from a list of irregular forms; the superlative is not given in Skjærvø (2009a), the form in the table is the corresponding Parthian form from Boyce (1977).

¹³I thank C. and J. Creider for discussion of these examples.

¹⁴Even if superlative *phér-istos* constitutes an archaic remnant, not paradigmatically related to *ameín-ōn*, Ancient Greek would contribute an ABC triple to the extent that a superlative built on *ameín-* is lacking, and the corresponding superlative is drawn from one of the other roots. Alternatively, the *agath-ós – ameín-ōn* pattern may simply be defective, as presented in (141), in which case there is no ABC pattern here.

¹⁵Although 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 (143) likely represents the norm.

¹⁶Thanks to C.E. Ariel Diertani for drawing my attention to this case.

¹⁷Ancient 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).

¹⁸Hewitt (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 (154)) 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)

¹⁹Rjagoev (1977, 163) gives *hüve-mm-in* as an alternative alongside *pare-mm-in* for the Tikhvin dialect of Karelian.

²⁰Nivkh also shows the pattern in (158a) for adverbial comparatives, derived from property-denoting roots, which are verbal in the language (which lacks adjectives): *ey-gur* – *ey-jo-gur* ‘be.in.hurry-(CMPR)-CONV’ = ‘quickly – more quickly’ (Gruzdeva 1998, 37). From the scanty description, the *-jo-*formative appears to be a diminutive marker for property-denoting verbs;

the one example of a comparative in Gruzdeva (1998) is unmarked.

²¹A relevant observation in this context, perhaps, is that there is independently a range of variation in the parts of speech that comparative morphemes may attach to. Basque is on the liberal side in allowing comparative affixes to attach to nouns as well as to adjectives, thus from *gizon*, *gau* ‘man, night’: *gizon-ago*, *gau-ago* ‘more of a man, more night’ (De Rijk 2008, 710). The comparative affix also attaches to nouns in Macedonian (and its close relative Bulgarian), as in *prijatel* ‘friend’, *po-prijatel* ‘CMPR-friend’ = ‘more of a friend’ (Friedman 2002, 22). There is indirect evidence that Macedonian (and Bulgarian) pattern with Basque in the affix-ordering in (158). This is hard to determine directly, since the comparative is a prefix, and there is no productive de-adjectival adverbial affix. However, we can note that the productive means of forming a deadjectival adverb in Macedonian (as in Slavic generally) is by means of the neuter inflectional suffix *-o*, whereas comparative and superlative markers appear to be able to attach peripheral to inflection, or inflection-like elements such as clitics and functional heads, as in *na jug* ‘to south’, *po-na-jug* ‘CMPR-to-south’ = ‘more southerly’, and *naj ne go saka* ‘SPRL NEG 3SG.OBJ like’ = ‘he dislikes him the most’ (Friedman 2002, 22). Clearly, there is a topic for further investigation here. Lunt (1952, 36) suggests the combination of comparative (or superlative) marker with nouns is rare in Macedonian, and applies to a group of words “mostly of Turkish origin”. In addition, Lunt suggests that the phrasal examples argue for an adverbial, rather than affixal, status for these elements, despite

the orthographic convention of writing them as a single word. In Bulgarian, the comparative and superlative constitute an independent prosodic domain, having their own stress (Alexander 2000, 198). There are fewer languages where clearly affixal comparatives attach to categories other than adjectives (or property denoting predicates), though W. U. Dressler, personal communication 2010, notes that the comparative affix attaches to verbs in Sanskrit.

²²More accurately: “the adverb *txarki* [i.e., the regularly derived from expected from adjective *txar* ‘bad’ -JDB] is little used... Its 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” (de Rijk 2008, 236).

²³Ultan (1972, 144) offers this adverb as an ABA pattern: *bald* – *ehere* – (*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”, an absolute superlative (compare also the positive adjective *baldig* ‘early’). The superlative corresponding to comparative *ehere* is the regular (*am*) *ehesten*, see, e.g., *WDG*, which notes also dialectal regular gradation: *bald* – *bälde/balder* – (*am*) *bäldesten/baldesten*. I thank M. Wagner and S. Wurmbrand for discussion of these examples.

²⁴The 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* compares, like English, with a cognate to *more*, but the cognates of *many* compare via the root *fle-* (see below).

²⁵A *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)*.

²⁶Recall 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.

²⁷The word for ‘more’ lacks comparative morphology, while the word for ‘most’ has comparative, rather than the expected superlative morphology.

²⁸The form *zyaadaa* appears to be used as a suppletive comparative ‘more’ to *kai* ‘many’, although in some (but not all) contexts, *zyaadaa* may have a non-comparative sense. I thank Rajesh Bhatt, personal communication 2010, for discussion of this element.

²⁹The superlative-forming particle *nái-* is borrowed into the Arumanian variety of Vlach Romani spoken in Macedonia, yielding apparent SSG violations: *bun^u – k’ama bun^u – náiibǔn^u* ‘good – better – best. Yet in describing these forms, Gołąb (1984, 85) notes that, as in the source language Macedonian, “the morpheme *nái* can be treated as a particle . . . since it clearly bears a secondary stress, and besides that it can also be used with compound adverbs or adverbial expressions” similar to (166). Thanks to Jason Merchant

for providing these examples and the reference.

³⁰I 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.

³¹The one speaker of the Ludian variety offered *äijäön* to render comparative *bol’še* ‘more’ in isolation, but gave *äjnä-mbi* (plausibly a mis-transcription of *enämbi*) in the context in (172).

³²‘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’šoe količestvo* ‘most big quantity’. Another isolated option offered for (171c) 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.’

Fennic dialectology is apparently quite complex. 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 (173)) within Karelian. Of interest, perhaps, is that the only speaker to offer the form in (173c) was the one speaker identifying themselves as a speaker of Ludian Karelian; this contrasts with the remark in Nau (1992) that gives superlatives with *ylen* only for non-Ludian varieties.

³³But see note 16 in section 5.3.

¹In 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) and Embick (2010).

²See Seiler (1950, 25-26) and 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.

³It is clear how the architecture in (181) 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 (or various other formulations referring to material that is unique to the comparative, such as inflectional morphology following the comparative affix). 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.

⁴Wurzel (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 were 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, with the unique root allomorph /hox/, subject to an idiosyncratic rule of intervocalic velar-deletion.

⁵Although 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 Surmi-

ran, on the basis, for example, of differences in stem form in the infinitive depending on whether the root is stressed (infinitives in $-\partial r$) 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 (181), or a re-consideration of the limits of the power of readjustment rules. Since the theory developed here relies on the Elsewhere Condition, 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.

⁶As 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 $-y$: $[[\text{happ}]y]$, then root allomorphy in the comparative $[[[\text{happ}]i]er]$ is precluded. Compare, for example, *good – better – best*, where comparative $-er$ is root-attached, to *good-ly – good-li-er – good-li-est*, with an intervening derivational suffix and a failure of suppletion. I have not investigated this prediction in detail, but know of no problematic cases. Also relevant here is that comparatives in some Indo-European languages (including Proto-Indo-European) are typically root-attaching, with stem augments in the positive lost in the comparative, thus Russian (typical of Slavic) adjectives with a positive in $-(o)k-$ lose that augment in the comparative: *vys-ok-ij* ‘high-OK-M.SG’ – *vyš-e* ‘high-er’.

⁷The VIP prevents, for example, the exponent $\text{CMPR} \rightarrow -er$ from being inserted at node c of (195), which would have strange consequences, such as yielding $-er$ (or perhaps *more*) as the comparative of all regular adjectives: *big – more* rather than *big – bigg-er*.

⁸A node α is the minimal node dominating features $F_1 \dots F_n$ iff α dominates $F_1 \dots F_n$ and there is no node β such that α dominates β and β dominates $F_1 \dots F_n$.

⁹In principle, Fusion and VIP could be made to differ in their interaction with cyclic, bottom-up vocabulary insertion, as a reviewer notes. See Chung (2007a) and Radkevich (2010, 62-65) for discussion. Radkevich suggests that insertion applies at lower nodes, and is overwritten on a later cycle by insertion of portmanteaus at a higher node. Another option is to assume a form of delayed spell-out, where application of a rule of exponence targeting a node on an inner cycle is suspended if the Vocabulary includes a rule that targets the same node but involves outer material as well, as in (194). See section 5.3.2 for such a proposal.

¹⁰With perhaps a question about Ancient Greek, see n. 14 to Chapter 4.

¹¹An initial investigation shows that the same conclusion appears to hold for the examples in the Surrey Suppletion Database <http://www.smg.surrey.ac.uk/Suppletion/>, to the extent that the relevant information can be extracted from examples presented there.

¹²The 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. Bybee argues that root suppletion governed by more peripheral elements should be less frequent than suppletion governed by less peripheral ones, but her framework does not (so far as I can see) preclude the unattested cases of on-contiguous syncretism excluded by (199).

¹³This excludes the treatment of certain types 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 (203a), lacking a default.

¹⁴This 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 intensified adjectives, see Ohtaki (2010) and references there.

¹⁵The parallel can be seen more sharply, if (204b) is restated via the equivalent, but slightly non-standard, notation in (i.b), yielding the pair (i.a-b), with CMPR preserved in the output so as to allow insertion of *-ior*):

- (i) a. GOOD, CMPR → opt- / ___] SPRL]
- b. GOOD, CMPR → mel-CMPR

¹⁶Incidentally, (202) turns out to exclude the hypothetical derivation in (179) considered, but not adopted, in section 4.3.

¹⁷Key ingredients of this alternative were suggested by Susi Wurmbrand and Harry van der Hulst.

¹⁸The cyclic status of the node *a* is irrelevant to this illustration: since the deepest node has no complement (within the complex X^0), no rules of exponence would apply even if it were cyclic.

¹⁹Radkevich 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 (202) are supported.

²⁰One point against treating the Korean facts as a lexical-semantic or pragmatic alternation is that the honorific suppletion is lost in passive, even though the agent may still be honorified (and marked as such with an honorific suffix); I thank Inkie Chung (personal communication 2011) for discussion of this point.

²¹A reviewer notes another possible adjacency-violating example in Tamil pronouns (Asher 1982), some of which show root allomorphy (suppletion) for nominative versus non-nominative case, but have the general structure: ROOT - NUMBER - CASE. Yoshiyuki Shibata notes also instances of number-governed root suppletion in Ainu verbs that appear to violate the adjacency condition.

²²Although note that if the Adjacency condition proves untenable, we lose only the account of the CSG2 — the account of the CSG1 would not be affected.

²³I 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.

²⁴Umlaut in the 2nd and 3rd person singular of the present, and in the subjunctive past, are predictable from the principal parts.

²⁵A possible counter-example is *shear*, past *sheared*, participle *sheared* or *shorn*. Note also variant past *shore*, given in the *OED*.

²⁶In particular from a semantic perspective, Wiese's labels for the features 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*]], and 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-*. Wurmbrand (2010, 2011b) 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 cross-linguistic comparison of subtle differences in the internal order of verb clusters among Germanic dialects with and without (descriptively) circumfixal participles.

²⁷Wiese notes precedents for this treatment, motivated by the patterns of stem syncretism discussed here, citing Adelung (1782) and Johnston (1997).

²⁸I thank Andrew Nevins for raising this point (personal communication

2006). My thanks to Nilüfer Şener for introducing me to Graziano-King's work, discussed below.

²⁹Graziano-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 and thus cannot be listed. 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.

³⁰A 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 interpre-

tation 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 $^{[\pm M]}$ 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 $^{[\pm M]}$ diacritic.

³¹At various presentations of this material, audience members have suggested acquisition or artificial learning experiments, involving nonce 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 (142)). 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 noun use as ‘erroneous’, definitions in sub-entries show the mass noun use: **data structure**...*the way data is organized*....

¹I thus abstract away from the derivation of morphological anti-causatives, in which the intransitive verb appears to be derived from the causative as opposed to the other way around; see Koontz-Garboden (2009) for recent discussion. In a few instances, the causative and inchoative verbs behave differently in a way that is potentially significant for matters discussed here, such as in the problematic Polish examples in section 6.4.7. Where I know

of such issues, they are duly noted below.

²A structure like (233b) would provide the same account of why (234) 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 (238) below). For the bulk of this chapter, I will mostly set aside (233b), returning to it occasionally, as the discussion warrants.

³Deciding the issue could be relevant for evaluating the viability of (233b); compare the discussion of bundling and allomorphy in section 5.4.

⁴Deadjectival 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.

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 (237) (see Apressjan 1992 for this view regarding analogous Russian examples) then it must be a domain of uncommonly rich suppletive relationships.

⁵The issues in this paragraph were raised by Edwin Williams and Mark Baker at presentations of this material.

⁶Kriz (2011) notes that the degree achievements that include comparative morphology in German (and English) are all built on what he calls ‘stubbornly relative’ adjectives — these are open scale adjectives that resist modification with adverbs such as *completely* or *almost*.

⁷There are numerous complexities in the extremely large literature on this topic. See Rothstein (2004) for a relatively recent treatment with review of the literature.

⁸The expression ‘for an hour’ is licit in (240a) on a different reading, namely, in which it modifies the extent not of the change event, but rather the duration 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*.

⁹The 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.

¹⁰See Kriz (2011) for an account along these lines, although the ambiguity that Kriz posits includes an additional POS operator in (242a); Kriz argues moreover that not all adjective classes allow for both representations, and that ‘stubbornly relational’ adjectives might allow only (242b).

¹¹The atelic examples imply that the salient endpoint is not reached, and

beg a continuation (as in (244b)). 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.

¹²Winter (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; see also Jackendoff (1996, 331).

¹³I thank Mirjam Fried for first raising this point for Czech, and Zhanna Glushan for discussion of Russian. Csirmaz (2009) notes for Hungarian that aspectual particles serve to disambiguate these readings in deadjectival degree achievements in that are ambiguous without such particles; the perfective verbal marker *meg* and other telicity-inducing elements yield the reading where the contextually salient endpoint of the scale is reached, with Hungarian thus overtly marking an aspectual distinction that is largely unmarked in English.

¹⁴Note also in this regard the deadjectival verbs of Karo Batak as presented in Woollams (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 |

¹⁵The following contrast illustrates:

- (i) I put the frozen soup in the microwave for 10 min, but...
- a. it only became cool (not even warm).
 - b. # it only cooled.

¹⁶The 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.*, rendered rather clumsily as ‘A lonely sail *gleams white* [?] in the (light) blue fog of the sea.’

¹⁷Compare also possible cognate triples in other Celtic languages, such as Irish *beag, tearc – lu – laghdaíonn* and Manx *beg, tiark – s’loo – leodhaghay*.

¹⁸The 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).

¹⁹I thank W. U. Dressler for raising the example, and M. Peters for help in finding the solution.

²⁰It 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.

²¹The example in (260) 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 (261).

²²This section relies heavily on observations by M. Marelj and especially M. Despić, whose assistance I acknowledge with gratitude.

²³Despić’s report of the meaning differences, from speakers representing a variety of areas, is presented below. M. Marelj, personal communication 2006, also reports that some speakers who accept *prodobriti (se)* understand it only in a facetious or humorous sense.

²⁴Despić reports variation among English speakers as to whether (and to what extent) English shows the same contrast. A reviewer reports losing the moral sense for *better* in *Mary is a better politician than John*, while finding *Mary is a good politician* ambiguous. I find the English data quite murky here, but there is a potential problem lurking here if the English comparative adjective *better* lacks a moral reading (out of context), while the English verb

to better can retain that moral sense.

²⁵Other languages in which the adjective meaning ‘good’ shows special grammatical properties in its ‘moral’ sense include French: Bouchard (1998, 142) provides the contrast between *un bon chef* ‘a good (at cooking) chef’ versus *un chef bon* ‘a chef [who is] good as a human being’, and Dutch, in which the attributive adjective *goed* ‘good’ lacks the otherwise systematic schwa inflection in prenominal position when used in its moral sense (Marcel den Dikken, personal communication, 2011).

²⁶I take it that the *-š-* in *u-xud-š-at* ‘(to) worsen’ is the comparative morpheme, Zaliznyak (1977); compare the long form comparative *xud-š-ij*.

²⁷Thanks 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.

²⁸This assumes that *mne xuže* is indeed the comparative of (267a); note also positive *mne xud-o* ‘me.DAT bad-ADV’ alongside (267a) with similar meaning, which provides a regular (non-suppletive) source for comparative *xuž-e*. The puzzle posed by (267b) is the absence of the suppletive root in the derived verb, while adjective/adverb *plox-* lacks a non-suppletive comparative.

²⁹In Nichols’s list of deadjectival forms of this sort (p. 334), some are glossed with a positive meaning and others with a comparative meaning,

such as *d.weax-lu* ‘get longer’ from *d.weaxa* ‘long’. Transitive counterparts of the deadjectival verbs (‘make X’) are formed from the adjectival root with causative morphology.

³⁰Data and discussion reported in this paragraph from L. Veselinova, R. Feldstein, N. Kariaeva, M. Marelj, and Ž. Bošković.

³¹M. 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:

- (i) a. alt – älter – veralten ‘old – older – to age’
arm – ärmer – verarmen ‘poor – poorer – to become poor’
- b. hart – härter – sich verhärten ‘hard – harder – to harden (intr.)’
jung – jünger – sich verjüngen ‘young – younger – to become younger’

³²For differential measure functions, including \mathbf{m}_Δ , 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 Chapter 7) and to deadjectival degree achievements, which likewise always denote a positive change. I have not found deadjectival

verbs meaning, for example, ‘to become less X’ without an explicit marker of negation. The adjectival domain thus contrasts with denominal verbs such as *to skin (an animal)*, *to scale (a fish)* etc.

³³Russian *xud-et*’ exists as a verb, but means ‘to lose weight, become thin’, a regular derivation from *xud-oj* ‘thin.’

³⁴Another approach that shares with the proposal under discussion in this paragraph the idea that the comparative semantics in degree achievements does not arise from a hidden instance of the (regular) comparative morpheme is that of Den Dikken et al. (2010). Unlike the V_{Δ} proposal, Den Dikken et al. build a comparative feature into all gradable adjectival roots. In their account, this comparative feature is normally uninterpretable, hence eliminated and uninterpreted, when the adjective is in a positive context, but the feature is interpreted in the verbal context, yielding the uniformly comparative semantics I have argued for above. Their proposal holds that the derivation offered in the main text, with a comparative morpheme (head) in the deadjectival verb [[[ADJ] -CMPR] -V] is universally excluded, and avoids the narrow problem just mentioned, by treating the suppletive comparatives such as English *better* (and by implication the other suppletive comparatives in Table 6.1) as synchronically underived. This strong view would appear to stumble on German verbs that transparently embed regular (non-suppletive) comparatives, such as *ver-schön-er-n* ‘to beautify’ in (238). A major focus of their paper is understanding why a simple adjective in Mandarin is necessarily understood as comparative without additional syntactic context: *ta gao* ‘he

tall' can only mean 'he is taller'; the positive reading ('he is tall') requires a pleonastic element *hen*.

¹Key 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).

²The figure is calculated from the data in the extensive survey reported in an appendix to Cysouw (2001). See also Baerman et al. (2005) and Pertsova (2007, 2011).

³The context of Kayne's proposal is for a decomposition of *many* and *few* into an adjective plus a silent noun NUMBER.

⁴I suspect that the Complexity Condition regulates particular types of meaning, call them 'grammatical meaning', for example the primitives that underlie the logical syntax of semantic computations. I do not expect the kind of lexical-conceptual complexity in, say, underived noun meanings to be within the scope of this constraint. Note also that the complexity condition, or Kayne's (277), is a condition on abstract representations, but is not taken here to be a condition on exponents/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.

⁵Beyond 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. Note that many languages have an approximative or relativizing affix, such as English *-ish*. In an appropriate context, these can be pressed into service to yield an implicature of a lesser degree: *Yao Ming is tall, but alongside Yao, Emeka Okafor is merely tall-ish*, but these affixes are distinct in meaning from a comparative of inferiority, and cannot, for example be used with a comparative syntax: **Emeka Okafor is tallish than Yao.* versus *...less tall than Yao.*

⁶There may be even more structure here. The point that Greek and German illustrate is that the element forming a periphrastic comparative of inferiority is the comparative of the polar antonym of the element that forms comparatives of superiority. This is true of English *less* and *more*, but Greek and German differ in having the comparative affix transparently contained in both poles.

⁷One qualification regarding Greek is that only synthetic comparatives may take a genitive standard, rather than a standard introduced by a particle; since there are no synthetic comparatives of inferiority, the standard in a comparison of inferiority can only be marked by a particle (*apo* in (283)) and not by genitive; see Merchant (to appear).

There are languages of the conjoined comparative type that mark the distinction in other ways. Urubu-Kaapor has a strategy for expressing comparison, using a nominalized form of the adjective, and a main locative predicate; superiority is marked by the adverbial meaning ‘above’ and inferiority by one meaning ‘below’, as in the following, from Kakumasu (1986, 344-345):

- (i) a'e ne 'ar koty we tamũi-ha
 he you above towards somewhat old.man-NML
 'He is older than you.'
- (ii) a'e ne wyr koty we tamũi-ha
 he you below towards somewhat old.man-NML
 'He is younger than you.'

⁸It 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.

⁹If agreement features are not “interpretable”, then the German facts in (292) are not relevant to (277), though they may be relevant to stronger claims of decomposition, as in Nanosyntax.

¹⁰Recall 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 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 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.

¹Australian 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. 16 to Chapter 1 on verbs.

²For 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.

³I 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).

⁴There are also periphrastic expressions meaning very roughly ‘above all’ or ‘most’.

⁵Kashmiri, like Hindi, has some borrowed adjectives (from Persian) which

occur only in comparative/superlative meanings.

⁶The 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, though 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.

⁷Gruzdeva (1998, 37) notes reduplication as a means for forming superlatives of adverbs. Cross-linguistically, this is a frequent strategy for forming absolute superlatives, or other intensified degrees, but the one example given by Gruzdeva is glossed as an apparent relative superlative: ‘most quickly [of all]’.

⁸The 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.

⁹Both Smythe (1948) and Eades (1979) give a standard comparative construction alongside the conjoined comparative, but only the former gives a comparative suffix.

¹⁰In addition to the positive adjective with an existential verb, Klamer (2010) gives an apparently idiomatic serial verb construction with the verbs glossed ‘not know’ and ‘come’. The comparative is formed with an intensi-

fier meaning ‘truly’, forming an conjoined construction when the standard is explicitly mentioned.

¹¹The Ekagi superlative is not exactly parallel to the conjoined comparative, but close enough for the purposes of this table.

¹²Property predicates are verbal, the superlative meaning is rendered with aspectual morphology.

¹³The available information is sketchy and includes no discussion of the syntax of comparatives, such as the expression of the standard. The language is of particular relevance here, as the superlative is derived from the comparative (Jany 2009, 97).

¹⁴See n. 14 of Chapter 1.

¹⁵Property-denoting predicates are verbal; comparison is marked via aspectual morphology.

¹⁶Hill (2005) notes that borrowing of the comparative adverb and particle from Spanish has rendered an older comparative syntax somewhat trickier to discern.

¹⁷The 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).

¹⁸The Portuguese loanword *mais* ‘more’ can be used in the expression of comparison.

¹⁹One 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.

¹See Benveniste (1948, 126).

²Although described as a prefix, the comparative and superlative markers in Bulgarian and Macedonian are likely not (morphological) affixes; see section 4.3.

³See n. 2.

⁴In Hindi, Kashmiri and Marathi, morphological comparative and superlative marking, borrowed from Persian and Sanskrit, can occur on adjectives borrowed from those languages. Some borrowings are reported as suppletive (or lexical) comparatives or superlatives; it is not clear whether these constitute grammatical superlatives, or instead pattern with English *optimal*. See also note 28 in Chapter 4

⁵See previous note.

⁶A form *bara*, glossed ‘better’ in Pandharipande (1997, 223), appears unrelated to the form given for ‘good’ in that source.

⁷There is variation among Romani varieties; some are described as marking no distinction between comparative and superlative; see Weigand (1888) and Katsánis and Dínas (1990) on varieties spoken in Greece, brought to my attention by Jason Merchant. See Chapter 3.

⁸Pobožniak (1964) gives a suppletive form for *better*, but Hancock (1995) states that this is a relic, occurring in fixed expressions.

⁹Kent (1953, 201) gives *maθ-išta* ‘greatest’ as a superlative, with no cor-

responding positive or comparative; Skjærvø (2009b, 80) lists this form as a suppletive superlative to *vazqrka-* ‘great’. A corresponding (non-suppletive) positive *maz-*, *mazant-* is given in Bartholomae (1904, 1158), but not in Kent (1953) or Skjærvø (2009b).

¹⁰Rastorgueva (1966) states that no superlative is attested in (Soviet) Balochi. Jahani and Korn (2009, 656) give a morphological form that derives superlatives from comparatives in some environments, noting that an ALL strategy is used in predicative position.

¹¹Morphological comparatives exist for Tajik loans.

¹²There is substantial dialect variation in Karelian, and not all varieties have a morphological superlative. See Rjagoev (1977) and Nau (1992).

¹³Helinski (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.

¹⁴Castrén (1854, 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.

¹⁵The difference between Khakas, which allows for the diminutive particle *arax* following the adjective in the comparative, and the Turkic languages with the optional comparative suffix *-raχ* may be an artefact of the descriptions.

¹⁶According to Lewis (1967, 55), Turkish had a comparative suffix *-rek*,

also used as a diminutive, but this is now obsolete. Turkish also has some borrowed comparatives from Persian and Arabic. M. Erdal (personal communication 2006) suggests a possible suppletive pair in Old Turkish: *edgü* ‘good’ – *yeğ* ‘better’; though Lewis gives *yeğ* ‘good’, *yeğ-rek* ‘better’ as a relic surviving in proverbs.

¹⁷The only strategy indicated for this language is the *whiter than white* construction mentioned above, also available in other Mongolic languages, and attested in Middle Mongol (Rybatzki 2003, 68).

¹⁸Mongolic languages generally lack morphological comparatives; the morphology in Moghol is comparative *-tar* and superlative *-tar-iin*, borrowed from Persian.

¹⁹See note 17.

²⁰Werner (1997a, n. 10) notes an apparent suppletive ‘better’ in Castrén (1858), but suggests this may be typo.

²¹Werner (1997b, 88) reports one speaker’s use of an apparent comparative suffix, not confirmed with other speakers. In general, regular comparatives in Yugh are of the ZERO type, with an ablative-mrked standard.

²²Early descriptions, starting with Bogoras (1922, 719), note a comparative suffix *-čeje* in Itelmen. Volodin (1976, 326) notes that his consultants could produce elicited examples with this suffix, but that not a single example was attested in recorded texts or spontaneous speech. In my own work, a generation later, speakers did not recognize forms cited by earlier authors, and produced only conjoined comparatives. Volodin also gives a second suffix,

-*ŋs*, but noting that it too was not part of the living language by the 1970s and not recognized by all speakers. For the superlative, Volodin gives analytic and synthetic constructions, but these are absolute superlatives.

²³Marr (1910, 17) notes a single morphological comparative in Laz, but states that this is a borrowing from Mingrelian.

²⁴In 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.

²⁵See previous note on the comparative element *nax*. In Kabardian, the pair for ‘many’ – ‘more’ appears to be suppletive, though this is not entirely clear from the available sources.

²⁶On a possible suppletive doublet for ‘more’, see Haspelmath’s remark cited in section 4.3.

²⁷In this language, superlatives are formed with the definite article without embedding the comparative.

Bibliography

- Abaev, V. I. (1964) *A grammatical sketch of Ossetic [English translation]*.
The Hague: Mouton and Co.
- Abdullaev, Z. G. (1967) Darginskij jazyk. In Vinogradov et al. (1967), 508–
523.
- Abondolo, Daniel (1998a) Khanty. In Abondolo (1998b), 358–386.
- Abondolo, Daniel, ed. (1998b) *The Uralic Languages*. London: Routledge.
- Abusch, Dorit (1986) Verbs of change, causation, and time. Technical Report
CSLI-86-50.
- Abusch, Dorit (2005) Causatives and mixed aspectual type. In *Reference and
quantification: The Partee effect*, Greg Carlson and Jeffrey Pelletier, eds.,
Stanford: CSLI.
- Acharya, Jayaraj (1991) *A Descriptive Grammar of Nepali and an Analyzed
Corpus*. Washington, D.C.: Georgetown University Press.

- Adelung, Johann Chr. (1782) *Umständliches Lehrgebäude der Deutschen Sprache, zur Erläuterung der Deutschen Sprachlehre für Schulen*. Leipzig: Breitkopf.
- Adger, David, Susana Béjar, and Daniel Harbour (2003) Directionality in Allomorphy: A reply to Carstairs-McCarthy. *Transactions of the Philological Society* **101**(1): 109–115.
- Aikhenvald, Alexandra (1995) *Bare*. München: Lincom Europa.
- Aikhenvald, Alexandra Y. (1998) Warekena. In *Handbook of Amazonian Languages vol. 4*, vol. 4, Desmond C. Derbyshire and Geoffrey K. Pullum, eds., Berlin: Mouton de Gruyter, 225–440.
- Aikhenvald, Alexandra Y. (2003) *A Grammar of Tariana, from Northwest Amazonia*. Cambridge: Cambridge University Press.
- Alexander, Ronelle (2000) *Intensive Bulgarian, vol. 1: A textbook and reference grammar*. Madison: University of Wisconsin Press.
- Allen, Margaret (1979) *Morphological Investigations*. Ph.D. thesis, University of Connecticut, Storrs.
- Ambrazas, Vytautas (1997) *Lithuanian Grammar*. Vilnius: Baltos Lankos.
- Andersen, Paul Kent (1983) *Word Order Typology and Comparative Constructions*. Amsterdam: John Benjamins.

- Anderson, Gregory David and K. David Harrison (1999) *Tyvan*. München: Lincom Europa.
- Anderson, Stephen R. (1992) *A-Morphous Morphology*, *Cambridge Studies in Linguistics*, vol. 62. Cambridge University Press.
- Anderson, Stephen R. (2008) Phonologically Conditioned Allomorphy in Surmiran (Rumantsch). *Word Structure* 1: 109–134.
- Andreev, I. A. (1966) Čuvaškij jazyk. In Vinogradov et al. (1966b), 43–65.
- Andrews, J. Richard (1975) *Introduction to Classical Nahuatl*. Norman: University of Oklahoma Press, 2 ed.
- Apresjan, Yuri D. (1992) *Lexical Semantics: User's guide to contemporary Russian vocabulary*. Ann Arbor: Karoma.
- Aquilina, Joseph (1959) *The Structure of Maltese: A Study in Mixed Grammar and Vocabulary*. The Royal University of Malta.
- Aristava, Š. K., X. S. Bgažba, M. M. Tsikolija, L. P. Čkadua, and K. S. Šakryl (1968) *Grammatika abkhazskogo jazyka: fonetika i morfologija*. Suxumi: Alašara.
- Ariste, Paul (1968) *A Grammar of the Votic Language*. Indiana University Press.
- Aronoff, Mark (1994) *Morphology by itself: Stems and inflectional classes*. Cambridge: MIT Press.

- Aronson, Howard I. (1989) *Georgian: A reading grammar*. Bloomington, IN: Slavica.
- Arsanis, G. V. (1968) Sovermennyj assirijskij jazyk. In Vinogradov et al. (1968), 489–507.
- Asher, R. E. (1982) *Tamil*. Amsterdam: North Holland.
- Asher, R. E. and T. C. Kumari (1997) *Malayalam*. NY, USA: Routledge.
- Ashton, E. O. (1947) *Swahili Grammar*. London: Longmans, 2 ed.
- Avrorin, V. A. (1982) *Sintaksičeskie issledovanija po nanajskomu jazyku*. Leningrad: Nauka.
- Avrorin, V. A. (2000) *Grammatika man'čžurskogo pis'mennogo jazyka*. Sankt-Peterburg: Nauka.
- Avrorin, V. A. and E. P. Lebedeva (1968) Oročskij jazyk. In Vinogradov et al. (1968), 191–209.
- Azimov, P., J. Amansaryev, and K. Saryev (1966) Turkmenskij jazyk. In Vinogradov et al. (1966b), 91–111.
- Babushkin, G. F. and G. I. Donidze (1966) Šorskij jazyk. In Vinogradov et al. (1966b), 467–481.
- Badia Margarit, Antonio M. (1962) *Gramatica catalana*. Madrid: Editorial Gredos.

- Baerman, Matthew, Dunstan Brown, and Greville G. Corbett (2005) *The syntax-morphology interface: a study of syncretism*. Cambridge: Cambridge University Press.
- Baird, Louise (2008) *A Grammar of Klon: A Non-Austronesian Language of Alor, Indonesia*. Canberra: Pacific Linguistics.
- Bakaev, Ch. Kh. (1966) Kurdsij jazyk. In Vinogradov et al. (1966a), 257–280.
- Baker, Mark (1988) *Incorporation: A Theory of Grammatical Function Changing*. Chicago: The University of Chicago Press.
- Baker, Mark (2009) Formal generative typology. In *The Oxford Handbook of Linguistic Analysis*, Bernd Heine and Heiko Narrog, eds., Oxford: Oxford University Press, 285–312.
- Baker, Mark C. and James McCloskey (2007) On the relationship of typology to theoretical syntax. *Linguistic Typology* **11**: 285–296.
- Bardakjian, Kevork B. and Bert Vaux (2001) *A textbook of Modern Western Armenian*. New York: Caravan Books.
- Barić, Eugenija, Mijo Lončarić, Dragica Malić, Slavko Pavešić, Mirko Peti, Vesna Zečević, and Marija Znika (1997) *Hrvatska gramatika*. Zagreb: Školska Knjiga.

- Bartholomae, Christian (1904) *Altiranisches Wörterbuch*. Strassburg: Karl J. Trübner.
- Barwise, Jon and Robin Cooper (1981) Generalized Quantifiers and Natural Language. *Linguistics and Philosophy* 4: 159–219.
- Bashir, Elena (2009) Wakhi. In Windfuhr (2009), 825–858.
- Baskakov, Nikolai Aleksandrovich (1966) Nogajskij jazyk. In Vinogradov et al. (1966b), 280–300.
- Batchelor, John (1905) *An Ainu-English-Japanese dictionary (Including a grammar of the Ainu language)*. Tokyo: Methodist Publishing House.
- Bauer, Brigitte L. M. and Jonathan Slocum (2006) Old French Online. <http://www.utexas.edu/cola/centers/lrc/eieol/ofrol-0-X.html>.
- Bauer, Winfred (1983) *Maori: Descriptive Grammars*. London; New York: Routledge.
- Beard, Robert (1995) *Lexeme-morpheme base morphology: a general theory of inflection and word formation*. SUNY Series in Linguistics, Albany: SUNY Press.
- Beck, Sigrid (1997) On the semantics of comparative conditionals. *Linguistics and Philosophy* 20: 229–271.
- Beck, Sigrid, Sveta Krasikova, Daniel Fleischer, Remus Gergel, Stefan Hofstetter, Christiane Savelsberg, John Vanderelst, and Elisabeth Villalta

- (2009) Crosslinguistic Variation in Comparison Constructions. *Linguistic Variation Yearbook* **9**: 1–66.
- Beck, Sigrid, Toshiko Oda, and Koji Sugisaki (2004) Parametric variation in the semantics of comparison: Japanese vs. English. *Journal of East Asian Linguistics* **13**: 289–344.
- Bennett, Michael and Barbara Partee (1978) Toward the logic of tense and aspect in English. Indiana University Linguistics Club, Bloomington.
- Benveniste, Émile (1948) *Noms d'agent et noms d'action en indo-européen*. Paris: Adrien-Maisonneuve.
- Benzing, Johannes (1955) *Lamutische grammatik*. Wiesbaden: Franz Steiner Verlag.
- Berg, Helma van der (1995) *A Grammar of Hunzib (with Texts and Lexicon)*. München: Lincom Europa.
- Berg, René van den (1989) *A Grammar of the Muna Language*. Dordrecht: Foris Publication.
- Berger, Hermann (1999) *Die Burushaski-Sprache von Hunza und Nager, Teil I: Grammatik*. Wiesbaden: Harassowitz Verlag.
- Berghäll, Liisa (2010) *Mauwake reference grammar*. Ph.D. thesis, University of Helsinki.
- Bergsland, Knut (1982) *Sydsamisk Grammatikk*. Oslo: Universitetsforlaget.

- Bergsland, Knut (1997) *Aleut Grammar: Unangam Tunuganaan Achixaasî*. Fairbanks: Alaska Native Language Center.
- Bertagaev, T. A. (1968) Burjatskij jazyk. In Vinogradov et al. (1968), 13–33.
- Besnier, Niko (2000) *Tuvaluan: a Polynesian language of the Central Pacific*. London: Routledge.
- Bhatt, Rajesh and Shoichi Takahashi (2008) Reduced and Unreduced Phrasal Comparatives, ms. University of Massachusetts at Amherst and University of Tokyo [<http://people.umass.edu/bhatt/papers/glow-phrasal.pdf>].
- Bickel, Balthasar (2008) A refined sampling procedure for genealogical control. *Sprachtypologie und Universalienforschung* **61**: 221–233.
- Bickel, Balthasar and Johanna Nichols (1996ff) The AUTOTYP database.
- Birtalan, Ágnes (2003) Oirat. In Janhunen (2003), 210–228.
- Blake, Barry J. (2001) *Case*. Cambridge: Cambridge University Press, 2 ed.
- Bläsing, Uwe (2003) Kalmuck. In Janhunen (2003), 229–247.
- Bobaljik, Jonathan David (1995) *Morphosyntax: the syntax of verbal inflection*. Ph.D. thesis, MIT, Cambridge.
- Bobaljik, Jonathan David (1997) If the head fits...: on the morphological determination of Germanic syntax. *Linguistics* **35**: 1029–1055.

- Bobaljik, Jonathan David (2000a) Implications of Itelmen Agreement Asymmetries. In *Proceedings of the Berkeley Linguistics Society Annual Meeting (1999)*, vol. 25, Steven S. Chang, Lily Liaw, and Josef Ruppenhofer, eds., Berkeley: Berkeley Linguistics Society, 299–310.
- Bobaljik, Jonathan David (2000b) The ins and outs of contextual allomorphy. In *University of Maryland Working Papers in Linguistics*, vol. 10, Kleantes K. Grohmann and Caro Struijke, eds., College Park, MD: University of Maryland, 35–71.
- Bobaljik, Jonathan David (2002a) A-chains at the PF-interface: Copies and ‘Covert’ Movement. *Natural Language and Linguistic Theory* **20**(2): 197–267.
- Bobaljik, Jonathan David (2002b) Realizing Germanic inflection: why morphology does not drive syntax. *Journal of Comparative Germanic Linguistics* **6**(2-3): 129–167.
- Bobaljik, Jonathan David (2008) Missing Persons: A case study in morphological universals. *The Linguistic Review* **25**(1-2): 203–230.
- Bobaljik, Jonathan David (In preparation) Distributed Morphology. In *Handbook of Morphology*, Andrew Spencer, ed., London: Wiley-Blackwell.
- Bobaljik, Jonathan David and Höskuldur Thráinsson (1998) Two heads aren’t always better than one. *Syntax* **1**(1): 37–71.

- Bobaljik, Jonathan David and Susi Wurmbrand (2005) The domain of agreement. *Natural Language and Linguistic Theory* **23**: 809–865.
- Bogal-Allbritten, Elizabeth (2008) Gradability and Degree Constructions in Navajo. Honors Thesis, Swarthmore College.
- Bogoras, Waldemar (1922) *Chukchee*. Washington: Government Printing Office.
- Bokarev, E. A. (1967) Tsezskij jazyk. In Vinogradov et al. (1967), 404–420.
- Bonet, Eulàlia and Daniel Harbour (To appear) Contextual Allomorphy. In *The Handbook of Exponence*, Jochen Trommer, ed.
- Bonet, Eulàlia, Maria-Rosa Lloret, and Joan Mascaro (2007) Allomorph selection and lexical preference: two case studies. *Lingua* **117**(9): 903–927.
- Bopp, Franz (1856) *A comparative grammar of the Sanskrit, Zend, Greek, Latin, Lithuanian, Gothic, German, and Slavonic Languages*, vol. 1. Williams and Norgate.
- Borer, Hagit (2005) *Structuring Sense (2 vols)*. Oxford: Oxford University Press.
- Borer, Hagit (2009) Categorizing roots. Handout of a talk given at CASTL Tromsø.
- Boretzky, Norbert (1994) *Romani: Grammatik des Kalderaš-Dialekts mit Texten und Glossar*. Wiesbaden: Harrassowitz Verlag.

- Borg, Albert and Marie Azzopardi-Alexander (1997) *Maltese*. London: Routledge.
- Bosworth, Joseph and T. Northcote Toller (1898) *An Anglo-Saxon Dictionary*. Oxford: Clarendon Press.
- Bouchard, Denis (1998) The distribution and interpretation of adjectives in French: A consequence of Bare Phrase Structure. *Probus* **10**: 139–184.
- Bošković, Željko (2010) Phases beyond clauses, ms. University of Connecticut.
- Boyce, Mary (1977) *A word-list of Manichaean Middle Persian and Parthian. With a reverse index by Ronald Zwanziger*. Tehran: Bibliotheca Pahlavi.
- Branenstein, Wilhelm and Manfred Mayrhofer (1964) *Handbuch des Altperisischen*. Wiesbaden: Otto Harrassowitz.
- Bresnan, Joan (1973) Syntax of the comparative clause construction in English. *Linguistic Inquiry* **4**: 275–343.
- Broadwell, George Aaron (2006) *A Choctaw Reference Grammar*. Lincoln, NE, USA: University of Nebraska Press.
- Broekhuis, Hans (1999) Adjectives and adjective phrases. *University of Tilburg Modern Grammar of Dutch Occasional Papers* **2**.
- Browne, Wayles (1993) Serbo-Croat. In Comrie and Corbett (1993), 306–387.

- Bruyne, Jacques De (1995) *A comprehensive Spanish grammar*. Oxford: Blackwell.
- Bulatova, N. Ja. (1999) *Jazyk saxalinskix evenkov*. Sankt-Peterburg: Beskonfliktnyj Sever.
- Bulatova, Nadezhda and Lenore Grenoble (1999) *Evenki*. München: Lincom Europa.
- Burganova, N. B., M. Z. Zakiev, and Kh. R. Kurbatov (1969) *Sovremennyy tatarskij literaturnyj jazyk*. Moscow: Nauka.
- Büring, Daniel (2007) *More or Less. Proceedings from the Annual Meeting of the Chicago Linguistic Society* **43**(2): 3–17.
- Bybee, Joan L. (1985) *Morphology: A Study of the Relation between Meaning and Form*. Amsterdam: John Benjamins.
- Caha, Pavel (2009) *The Nanosyntax of case*. Ph.D. thesis, CASTL Tromsø.
- Calabrese, Andrea (2005) *Markedness and economy in a derivational model of phonology*. Berlin: Mouton de Gruyter.
- Calder, George (1990) *A Gaelic Grammar [1923]*. Glasgow: Gairm Publications.
- Caldwell, Robert (1875) *A comparative grammar of the Dravidian or South-Indian family of languages*. London: Trübner, 2nd ed.

- Canger, U. (1966) The category of comparison. *Bulletin de la société polonaise de linguistique* **24**: 145–161.
- Carstairs, Andrew (1987) *Allomorphy in Inflexion*. Croom Helm Linguistics Series, London: Croom Helm.
- Carstairs, Andrew (1988) Some implications of phonologically conditioned suppletion. In *Yearbook of Morphology 1998*, Geert Booij and Jaap van Marle, eds., Dordrecht: Foris, 67–94.
- Carstairs-McCarthy, Andrew (1992) *Current Morphology*. London: Routledge.
- Carstairs-McCarthy, Andrew (2001) Grammatically conditioned allomorphy, paradigmatic structure, and the Ancestry Constraint. *Transactions of the Philological Society* **99**(2): 223–245.
- Carstairs-McCarthy, Andrew (2003) Directionality and Locality in Allomorphy: A Response to Adger, Béjar, and Harbour. *Transactions of the Philological Society* **101**(1): 117–124.
- Castrén, M. Alexander (1854) *Grammatik der samojedischen Sprachen [reprint]*. Bloomington: Indiana University, 1966 ed.
- Castrén, M. Alexander (1858) *Versuch einer jennissei-ostjakischen und kottischen Sprachlehre*. St. Petersburg: Kaiserlich Akademie der Wissenschaften.

- Chamoreau, Claudine (2003) *Purépecha de Jarácuaro, Michoacán*. México: El Colegio de México.
- Chantraine, Pierre (1967) *Morphologie historique du grec*. Paris: Klincksieck.
- Chapman, Shirley and Desmond Derbyshire (1991) Paumarí. In *Handbook of Amazonian Languages vol.3*, vol. 3, Desmond C. Derbyshire and Geoffrey K. Pullum, eds., Berlin: Mouton de Gruyter, 161–352.
- Charney, Jean Ormsbee (1993) *A Grammar of Comanche*. University of Nebraska Press.
- Chirikba, Viacheslav A. (2003) *Abkhaz*. München: Lincom Europa.
- Chomsky, Noam (1957) *Syntactic Structures*. The Hague: Mouton.
- Chomsky, Noam (2001) Derivation by phase. In *Ken Hale: A life in language*, Michael Kenstowicz, ed., MIT Press, 1–52.
- Chung, Inkie (2007a) *Ecology of PF: A study of Korean phonology and morphology in a derivational approach*. Ph.D. thesis, University of Connecticut.
- Chung, Inkie (2007b) Suppletive negation in Korean and Distributed Morphology. *Lingua* **117**: 95–148.
- Chung, Inkie (2009) Suppletive verbal morphology in Korean and the mechanism of vocabulary insertion. *Lingua* **45**: 533–567.

- Cinque, Guglielmo (1999) *Adverbs and functional heads: A cross-linguistic perspective*. Oxford: Oxford University Press.
- Clahsen, Harald and Christine Temple (2003) Words and rules in Williams Syndrome. In *Language Competence across Populations*, Yonata Levy and Jeannette Schaeffer, eds., Erlbaum, 323–352.
- Cleasby, Richard and Gudbrand Vigfusson (1874) *An Icelandic-English Dictionary*. London: Clarendon Press.
- Coates, J. G. (1982) The *-džik* comparative suffix in contemporary Komi usage. *Transactions of the Philological Society* **80**(1): 119–129.
- Cohen, Marcel (1936) *Traité de langue amharique (Abyssinie)*. Paris: Institut d'ethnologie.
- Colarusso, John (1992) *A grammar of the Kabardian language*. Calgary: University of Calgary Press.
- Cole, Desmond T. (1955) *An Introduction to Tswana Grammar*. London: Longmans, Green and Co.
- Comrie, Bernard and Greville G. Corbett, eds. (1993) *The Slavonic Languages*. London: Routledge.
- Conzemius, Eduard (1929) Notes on the Miskito and Sumu languages of eastern Nicaragua and Honduras. *International Journal of American Linguistics* **5**(1): 57–115.

- Corbett, Grenville G. (2007) Canonical typology, suppletion and possible words. *Language* **83**(1): 8–42.
- Coupe, Alexander Robertson (2007) *A Grammar of Mongsen Ao*. Berlin; New York: Mouton de Gruyter.
- Cowgill, Warren (1970) Italic and Celtic Superlatives and the Dialects of Indo-European. In *Indo-European and the Indo-Europeans*, George Cardona, Henry M. Hoenigswald, and Alfred Senn, eds., Philadelphia: University of Pennsylvania, 113–153.
- Crazzolara, J. P. (1933) *Outlines of a Nuer grammar*. Wien: Anthropos.
- Creider, Chet A. and Jane Tapsubei Creider (1989) *A Grammar of Nandi*. Hamburg: Helmut Buske Verlag.
- Crowell, Thomas Harris (1979) *A Grammar of Bororo*. Ph.D. thesis, Cornell University, Ithaca.
- Csirmaz, Aniko (2009) Scales, verbs and verbal modifiers, ms. University of Utah.
- Csúcs, Sándor (1998) Udmurt. In Abondolo (1998b), 276–304.
- Cuzzolin, Pierluigi and Christian Lehmann (2004) Comparison and gradation. In *Morphologie: ein internationales Handbuch zur Flexion und Wortbildung*, Geert Booij, Christian Lehmann, and Joachim Mugdan, eds., Berlin: de Gruyter, 1212–1220.

- Cysouw, Michael (2001) *The paradigmatic structure of person marking*. Ph.D. thesis, Katholieke Universiteit Nijmegen.
- Cysouw, Michael (2003) *The Paradigmatic Structure of Person Marking*. Oxford: Oxford University Press.
- Dalalakis, Jenny (1994) English adjectival comparatives and Familial Language Impairment. In *Linguistic Aspects of Familial Language Impairment. McGill Working Papers in Linguistics*, vol. 10, John Matthews, ed., Montréal: McGill University, 50–66.
- Dayley, Jon P. (1989) *Tümpisa (Panamint) Shoshone grammar*. Berkeley: University of California Press.
- de S. Juan Crisóstomo Nájera, Fr. Manuel (1879) *Gramática del Tarasco*. Morelia: Octaviano Ortiz.
- Debrunner, Albert and Jacob Wackernagel (1929) *Altindische Grammatik III. Deklination der Nomina, Zahlwörter – Pronomina*. Göttingen: Vandenhoeck and Ruprecht.
- Décsy, Gyula (1966) *Yurak Chrestomathy*. Bloomington: Indiana University.
- Dedrick, John M. and Eugene H. Casad (1999) *Sonora Yaqui language structures*. Tucson: University of Arizona Press.
- Derbyshire, Desmond C. (1985) *Hixkaryana and Linguistic Typology*. Arlington, Texas: SIL and University of Texas.

- Derbyshire, Desmond C. and Geoffrey K. Pullum, eds. (1986) *Handbook of Amazonian Languages vol. 1*, vol. 1. Berlin: Mouton de Gruyter.
- Desheriev, Ju. D. (1967a) Batsbijskij jazyk. In Vinogradov et al. (1967), 228–246.
- Desheriev, Ju. D. (1967b) Čečenskij jazyk. In Vinogradov et al. (1967), 190–209.
- Despić, Miloje (2008) Explaining *prodobriti se*, manuscript, University of Connecticut.
- Despić, Miloje (2011) *Syntax in the absence of Determiner Phrase*. Ph.D. thesis, University of Connecticut, Storrs.
- Despić, Miloje and Yael Sharvit (To appear) Some Non-Intersective Adjectives are Genuinely Noun-Taking. In *Proceedings of NELS 39*, Ithaca: Cornell Linguistics Club.
- Diels, Paul (1963) *Altkirchenslavische Grammatik I: Grammatik*, vol. 1. Heidelberg: Carl Winter Universitätsverlag, 2nd ed.
- Dietiker, Simone Renaud (1983) *En Bonne Forme*. Lexington, Mass.: D.C. Heath and Co., 3rd ed.
- Dikken, Marcel den (2005) Comparative correlatives comparatively. *Linguistic Inquiry* **36**(4): 497–532.

- Dikken, Marcel den (2007) Phase Extension: Contours of a theory of the role of head movement in phrasal extraction. *Theoretical Linguistics* **33**: 1–41.
- Dikken, Marcel den, Yang Gu, and Jie Guo (2010) Positively comparative, ms. CUNY and The Chinese University of Hong Kong.
- Dirr, Adolf (1928) *Einführung in das Studium der kaukasischen Sprachen*. Leipzig: Verlag der Asia Major.
- Dixon, R. M. W. (1972) *The Dyirbal Language of North Queensland*. Cambridge: Cambridge University Press.
- Dixon, R. M. W. (1988) *A Grammar of Boumaa Fijian*. Chicago: University of Chicago Press.
- Dixon, R.M.W. (1982) Where have all the adjectives gone? In *Where have all the adjectives gone?*, R.M.W. Dixon, ed., Berlin: Mouton, 1–62.
- Dixon, Robert M. W. (1977) *A grammar of Yidjî*. Cambridge, UK; New York, USA: Cambridge University Press.
- Dmitrieva, L. V. (1966) Jazyk barabinskix tatar. In Vinogradov et al. (1966b), 155–172.
- Doke, Clement M. (1963) *Textbook of Zulu Grammar*. Cape Town: Longmans, 6th ed.
- Dolakova, P. I. (1967) Ingušskij jazyk. In Vinogradov et al. (1967), 210–227.

- Donaldson, Bruce R. (1993) *Afrikaans*. Berlin: Mouton.
- Donohue, Mark (2004) A grammar of the Skou language of New Guinea. Ms. National University of Singapore [available at: <http://ldh.livingsources.org/archive/>].
- Dowty, David (1979) *Word Meaning and Montague Grammar*. Dordrecht: Reidel.
- Dowty, David R. (1991) Thematic Proto-Roles and Argument Selection. *Language* **67**: 547–619.
- Doyle, Aidan (2001) *Irish*. München: Lincom Europa.
- Drabbe, P. (1952) *Spraakkunst van het Ekagi*. 's-Gravenhage: Martinus Nijhoff.
- Dressler, Wolfgang U. and Ferenc Kiefer (1990) Austro-hungarian morpho-pragmatics. In *Contemporary Morphology*, Wolfgang U. Dressler, Hans C. Luschützky, Oskar E. Pfeiffer, and John R. Rennison, eds., Walter de Gruyter, 69–77.
- Driem, George van (1987) *Grammar of Limbu*. Berlin: Mouton de Gruyter.
- Driem, George van (1993) *A Grammar of Dumi*. Berlin: Mouton de Gruyter.
- Driem, George van (1998) *Dzongkha (Languages of the Greater Himalayan Region)*. Leiden, the Netherlands: Research School CNWS, School of Asian, African, and American Studies.

- Du Feu, Veronica (1996) *Rapanui*. London: Routledge.
- Dum-Tragut, Jasmine (2009) *Armenian: Modern Eastern Armenian*. Amsterdam: John Benjamins.
- Dumézil, George (1931) *La langue des oubykhs*. Paris: Honoré Champion.
- Dutton, Thomas Edward (2003) *A dictionary of Koiari, Papua New Guinea, with grammar notes*. Canberra, Australia: Pacific Linguistics, Research School of Pacific and Asian Studies, The Australian National University.
- Eades, Diana (1979) Gumbaynggir. In *Handbook of Australian Languages*, R. M. W. Dixon and Barry J. Blake, eds., Amsterdam: John Benjamins, 245–361.
- Edelman, D. (Joy) I. and Leila R. Dodykhudoeva (2009) Shughni. In *Windfuhr* (2009), 787–824.
- Egli, Hans (1990) *Paiwangrammatik*. Wiesbaden: Harrassowitz Verlag.
- Einarsson, Stefán (1945) *Icelandic*. Baltimore: Johns Hopkins Press.
- Elfenbein, Josef (1998) Brahui. In Steever (1998a), 388–.
- Embick, David (2003) Locality, Listedness, and Morphological Identity. *Studia Linguistica* **57**(5): 143–169.
- Embick, David (2007) Blocking effects and analytic/synthetic alternations. *Natural Language and Linguistic Theory* **25**(1): 1–37.

- Embick, David (2010) *Localism versus Globalism in Morphology and Phonology*. Cambridge: MIT Press.
- Embick, David and Alec Marantz (2008) Architecture and Blocking. *Linguistic Inquiry* **39**(1): 1–53.
- Embick, David and Rolf Noyer (1999) Locality in post-syntactic operations.
- Emmerick, Ronald E. (2009) Khotanese and Tumshuqese. In Windfuhr (2009), 377–415.
- Enfield, N. J. (2007) *A Grammar of Lao*. Berlin: Mouton de Gruyter.
- Ennaji, Moha, Ahmed Makhoukh, Hassan Es-saiydy, Mohamed Moubtasime, and Souad Slaoui (2004) *A Grammar of Moroccan Arabic*. Mohammedia: Imprimerie de Fédala.
- Erdal, Marcel (2004) *A grammar of Old Turkic*. Leiden: Brill.
- Ermushkin, Grigorij I. (2004) Srednetjoshskij dialekt èrzja-mordovskogo jazyka. *Mitteilungen der Societas Uralo-Altaica* **24**.
- Evans, Nicholas (1995) *A grammar of Kayardild: with historical-comparative notes on Tangkic*. Berlin; New York: Mouton de Gruyter.
- Evans, Nicholas (2003) *Bininj Gun-Wok: A Pan-Dialectal Grammar of Mayali, Kunwinjku, and Kune*. Canberra, Australia: Pacific Linguistics, Research School of Pacific and Asian Studies, The Australian National University.

- Everett, Daniel L. (1986) Pirahã. In Derbyshire and Pullum (1986), 200–325.
- Everett, Daniel L. and Barbara Kern (1997) *Wari'*. London: Routledge.
- Fähnrich, Heinz (1991) Old Georgian. In Harris (1991a), 129–218.
- Fedden, Olcher Sebastian (2007) *A Grammar of Mian, a Papuan Language of New Guinea*. Ph.D. thesis, University of Melbourne, Melbourne.
- Fernandez, Frank (1967) *A Grammatical Sketch of Remo: A Munda Language*. Chapel Hill, North Carolina, USA: PhD thesis, University of North Carolina at Chapel Hill.
- von Fintel, Kai (1999) NPI licensing, Strawson entailment, and context dependency. *Journal of Semantics* **16**: 97–148.
- Fitzgibbons, Natalia, Yael Sharvit, and Jon Gajewski (2009) Plural superlatives and distributivity. In *Proceedings of SALT XVIII*, 302–318.
- Fortescue, Michael (1984) *West Greenlandic*. London: Croom Helm.
- Fortune, R. F. (1942) *Arapesh*. New York: J. J. Augustin.
- Foster, Mary LeCron (1969) *The Tarascan Language*. Berkeley: University of California Press.
- Frajzyngier, Zygmunt, Eric Johnston and Andrian Edwards (2005) *Grammar of Mina*. Berlin; New York: Mouton de Gruyter.

- Frajzyngier, Zygmunt (2001) *A Grammar of Lele*. Stanford, California: Center for the Study of Language and Information.
- Friedman, Victor A. (2002) *Macedonian*. München: Lincom Europa.
- Frisk, Hjalmar (1960-1970) *Griechisches etymologisches Wörterbuch*. Heidelberg: Carl Winter.
- Fuchs, David R. (1949) Der Komparativ und Superlativ in den finnisch-ugrischen Sprachen. *Finnsich-ugrischen Forschungen* **30**: 147–230.
- Gadzhieva, N. Z. (1966) Azerbajdžanskij jazyk. In Vinogradov et al. (1966b), 66–90.
- Gajewski, Jon (2010) Superlatives, NPIs and *most*. *Journal of Semantics* **27**(1): 125–137.
- Garde, Paul (1998) *Grammaire russe: phonologie et morphologie*. Paris: Institute d'études slaves, 2 ed.
- Garusinghe, Dayaratne (1962) *Sinhalese: The Spoken Idiom*. München: Max Hueber Verlag.
- Gathercole, Virginia C. (1983) Haphazard examples, prototype theory, and the acquisition of comparatives. *First Language* **4**: 169–196.
- Genetti, Carol (2007) *A Grammar of Dolakha Newar*. Berlin; New York: Mouton de Gruyter.

- Georg, Stefan (2003a) Mongghul. In Janhunen (2003), 286–306.
- Georg, Stefan (2003b) Ordos. In Janhunen (2003), 193–209.
- Glinert, Lewis (1989) *The grammar of modern Hebrew*. Cambridge: Cambridge University Press.
- Gołąb, Zbigniew (1984) *The Arumanian dialect of Kruševo in SR Macedonia, SFR Yugoslavia*. Skopje: Macedonian Academy of Sciences and Arts.
- González-Díaz, Victorina (2006) The origin of English periphrastic comparatives. *English Studies* 87(6): 707–739.
- Gordon, Jr., Raymond, ed. (2005) *Ethnologue: Languages of the world*. Dallas: SIL International, 15 ed.
- Graczyk, Randolph (2007) *A Grammar of Crow*. Lincoln, NE, USA: University of Nebraska Press.
- Grandgent, Charles Hall and E. H. Wilkins (1915) *Italian Grammar*. Boston: D. C. Heath.
- Graziano-King, Janine (1999) *Acquisition of comparative forms in English*. Ph.D. thesis, CUNY.
- Greenberg, Joseph H. (1966) *Language Universals*. Mouton.
- Grimm, Jacob and Wilhelm Grimm (1854-1961) Deutsches Wörterbuch von Jacob Grimm und Wilhelm Grimm. Online edition <http://germazope.uni-trier.de:8080/Projekte/DWB>.

- Grjunberg, A. L. (1966) Tatskij jazyk. In Vinogradov et al. (1966a), 281–301.
- Gruzdeva, Ekaterina (1998) *Nivkh*. München: Lincom Europa.
- Gudava, T. E. (1967a) Bagvalinskij jazyk. In Vinogradov et al. (1967), 351–367.
- Gudava, T. E. (1967b) Botikhskij jazyk. In Vinogradov et al. (1967), 293–306.
- Gudava, T. E. (1967c) Godoberinskij jazyk. In Vinogradov et al. (1967), 307–321.
- Gudava, T. E. (1967d) Tindinskij jazyk. In Vinogradov et al. (1967), 368–383.
- Gudjedjiani, Chato and Mykolas L. Palmaitis (1986) *Upper Svan: Grammar and Texts*. Viliuns: Mokslas.
- Gui, Ming Chao (2000) *Kunming Chinese*. München: Lincom Europa.
- Gulya, Janos (1966) *Eastern Ostyak Chrestomathy*. Indiana University Publications.
- Gusain, Lakhan (2000) *Bagri*. München: Lincom Europa.
- Hackl, Martin (2000) *Comparative Quantifiers*. Ph.D. thesis, M.I.T.
- Hackl, Martin (2009) On the grammar and processing of proportional quantifiers: *most* versus *more than half*. *Natural Language Semantics* **17**: 63–98.
- Hagman, Roy S. (1977) *Nama Hottentot Grammar*. Bloomington, IN, USA: Indiana University.

- Hakulinen, Lauri (1957) *Handbuch der finnischen Sprache [1. Band]*. Wiesbaden: Otto Harrassowitz.
- Halle, Morris (1990) An approach to morphology. In *Proceedings of NELS xx*, vol. 20, J. Carter, R.-M. Dechaine, B. Philip, and T. Sherer, eds., Amherst: GLSA, 150–184.
- Halle, Morris (1997) Some Consequences of the representation of words in memory. *Lingua* **100**: 91–100.
- Halle, Morris and Alec Marantz (1993) Distributed Morphology and the pieces of inflection. In *The view from Building 20: Essays in Linguistics in honour of Sylvain Bromberger*, Ken Hale and Samuel Jay Keyser, eds., Cambridge: MIT Press, 111–176.
- Halle, Morris and Alec Marantz (1994) Some Key Features of Distributed Morphology. In *Papers on Phonology and Morphology*, vol. 21, Andrew Carnie, Heidi Harley, and Tony Bures, eds., Cambridge: MIT Working Papers in Linguistics, 275–288.
- Hancock, Ian (1995) *A handbook of Vlax Romani*. Ann Arbor: Slavica.
- Hankamer, Jorge and Line Mikkelsen (2005) When Movement Must Be Blocked: A Reply to Embick and Noyer. *Linguistic Inquiry* **36**(1): 85–125.
- Hanoteau, A. (1896) *Essai de grammaire de la langue tamachek'*. Alger: Adolphe Jourdan, 2 ed.

- Harbour, Daniel (2006) Person hierarchies and geometries without hierarchies or geometries. *QM Occasioanl Paper Advancing Linguistics* 6.
- Harley, Heidi and Rolf Noyer (1999) Distributed Morphology. *Glott International* 4(4): 3–9.
- Harms, Phillip Lee (1994) *Epena Pedee Syntax*. Arlington: Summer Institute of Linguistics.
- Harrell, Richard S. (2004) *A Short Reference Grammar of Moroccan Arabic with Audio CD*. Washington, D.C.: Georgetown University Press.
- Harris, Alice C., ed. (1991a) *The Indigenous Languages of the Caucasus vol. 1*, vol. 1. Delmar, N.Y.: Caravan Books.
- Harris, Alice C. (1991b) Mingerlian. In Harris (1991a), 313–394.
- Harrison, K. David (2000) *Topics in the phonology and morphology of Tuvan*. Ph.D. thesis, Yale University.
- Haspelmath, Martin (1993) *A Grammar of Lezgian*. Berlin; New York: Mouton de Gruyter.
- Hauge, Kjetil Rå (1999) *A short grammar of contemporary Bulgarian*. Bloomington: Slavica.
- Hausenberg, Anu-Reet (1998) Komi. In Abondolo (1998b), 305–326.

- Hay, Jennifer (2000) Morphological adjacency constraints: a synthesis. In *Proceedings of SCIL 9*, Cambridge: MITWPL, 17–29.
- Hay, Jennifer, Christopher Kennedy, and Beth Levin (1999) Scalar structure underlies telicity in "degree achievements". In *Proceedings of SALT IX*, T. Mathews and D. Strolovitch, eds., CLC Publications, 127–144.
- Hayashishita, J.-R. (2009) *Yori-comparatives: a reply to Beck et al. (2004)*. *Journal of East Asian Linguistics* **18**: 65–100.
- Hayyim, Sulayman (1934-1936) *New Persian-English dictionary*. Teheran: Librairie-imprimerie Bérroukhim, online edition <http://dsal.uchicago.edu/dictionaries/hayyim/> ed.
- He, Rufen, Siqi Zeng, Shanzhong Tian, and Dengxian Lin (1986a) *Zhongguo shao shu min zu yu yan jian zhi cong shu: Gaoshan zu yuyan zhi-Amis*. Beijing: Minzu.
- He, Rufen, Siqi Zeng, Shanzhong Tian, and Dengxian Lin (1986b) *Zhongguo shao shu min zu yu yan jian zhi cong shu: Gaoshan zu yuyan zhi-Amis*. Beijing: Minzu.
- Heath, Jeffrey (1984) *Functional grammar of Nunggubuyu*. Canberra: Australian Institute of Aboriginal Studies.
- Heath, Jeffrey (1999) *A Grammar of Koyraboro (Koroboro) Senni: The Songhay of Gao, Mali*. Cologne, Germany.

- Heath, Jeffrey (2005) *A Grammar of Tamashek (Tuareg of Mali)*. Berlin; New York: Mouton de Gruyter.
- Hebert, Raymond J. and Nicholas Poppe (1963) *Kirghiz Manual*. Bloomington and the Hague: Indiana University and Mouton &Co.
- Heim, Irene (1985) Notes on comparatives and related matters, unpublished manuscript, University of Texas, Austin.
- Heim, Irene (2000) Degree operators and scope. In *Proceedings of Semantics and Linguistic Theory 10*, Brandon Jackson and Tanya Matthews, eds., Ithaca: CLC Publications, 40–64.
- Heim, Irene (2006) Little. In *Proceedings of SALT*, M. Gibson and J. Howell, eds., Cornell University, 35–58.
- Heine, Bernd (1997) *Cognitive Foundations of Grammar*. Oxford: Oxford University Press.
- Helimski, Eugene (1998a) Nganasan. In Abondolo (1998b), 480–515.
- Helimski, Eugene (1998b) Selkup. In Abondolo (1998b), 548–579.
- Hemon, Roparz (1975) *A Historical Morphology and Syntax of Breton*. Dublin Institute for Advanced Studies.
- Hemon, Roparz (1995) *Breton Grammar [10th ed, transl. M. Everson]*. Everson Gunn Teoranta.

- Herdan, Simona and Yael Sharvit (2006) Definite and non-definite superlatives and NPI licensing. *Syntax* **9**(1): 1–31.
- Herrity, Peter (2000) *Slovene: A comprehensive grammar*. London: Routledge.
- Hettich, Bela (2010) *Ossetian*. München: Lincom.
- Hewitt, B. George (1991) Abkhaz. In *The Indigenous Languages of the Caucasus vol.*, vol. 2, B. George Hewitt, ed., Delmar, N.Y.: Caravan Books, 38–88.
- Hewitt, B. George (1995) *Georgian: A structural reference grammar*. Amsterdam: John Benjamins.
- Hewitt, B. George and Z. K. Khibia (1979) *Abkhaz*. Amsterdam: North Holland.
- Hewitt, George (1996) *Georgian: A Learner's Grammar*. London: Routledge.
- Hill, Jane H. (2005) *A grammar of Cupeño*. Berkeley: University of California Press.
- Holes, Clive (1990) *Gulf Arabic*. London: Routledge.
- Holisky, Dee Ann (1991) Laz. In Harris (1991a), 395–472.
- Hólmarsson, Sverrir, Christopher Sanders, and John Tucker (1989) *Íslenskensk orðabók / Concise Icelandic-English Dictionary*. Reykjavík: Íðunn.

- Holmer, Arthur J. (1996) *A Parametric Grammar of Seediq*. Sweden: Lund University Press.
- Holmes, Philip and Ian Hinchcliffe (2003) *Swedish: A Comprehensive Grammar*. London: Routledge, 2nd ed.
- Holton, David, Peter Mackridge, and Irene Philippaki-Warbuton (1997) *Greek: A comprehensive grammar of the modern language*. London: Routledge.
- Horn, Laurence R. (1972) *On the Semantic Properties of Logical Operators in English*. Ph.D. thesis, UCLA.
- Horn, Laurence R. (1989) *A Natural History of Negation*. Chicago: University of Chicago Press.
- Huddleston, Rodney and Geoffrey K. Pullum (2001) *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press.
- Huffman, Franklin E. (1970) *Modern Spoken Cambodian*. New Haven and London: Yale University press.
- Hugjiltu, Wu (2003) Bonan. In Janhunen (2003), 325–346.
- Hutchison, John P. (1981) *The Kanuri Language: a reference Grammar*. Madison, Wisconsin: African Studies Program, University of Wisconsin, Madison.

- Ikoro, Suanu M. (1996) *The Kana Language*. Leiden, the Netherlands: Research School CNWS.
- Ingram, David (1978) Typology and universals of personal pronouns. In *Universals of Human Language, vol. III: Word Structure*, Joseph H. Greenberg, ed., Stanford: Stanford University Press, 213–248.
- Inojosa, Mario Franco, ed. (1966) *Arte de la lengua aymara de Diego de Torres Rubio*. Lima: Lyrsa.
- Isaev, M. I. (1966) Osetinskij jazyk. In Vinogradov et al. (1966a), 237–256.
- Ishii, Yasuo (1991) *Operators and Empty Categories in Japanese*. Ph.D. thesis, University of Connecticut, Storrs.
- Iwasaki, Shoichi and Preeya Ingkaphirom (2005) *A Reference Grammar of Thai*. New York: Cambridge University Press.
- Jabłońska, Patrycja (2007) *Radical Decomposition and Argument Structure*. Ph.D. thesis, University of Tromsø.
- Jackendoff, Ray (1996) The proper treatment of measuring out, telicity, and perhaps even quantification in English. *Natural Language and Linguistic Theory* 14: 305–354.
- Jacobs, Neil G. (2005) *Yiddish: A linguistic introduction*. Cambridge: Cambridge University Press.

- Jacq, Pascale and Paul Sidwell (1999) *Sapuan (Səpuar)*. München: Lincom Europa.
- Jahani, Carina and Agnes Korn (2009) Balochi. In Windfuhr (2009), 634–692.
- Jakobson, Roman (1941) *Kindersprache, Aphasie, und allgemeine Lautgesetz*. Uppsala: Universitets Aarskrift.
- Jakovlev, N. and D. Ashxamaf (1941) *Grammatika adygejskogo literaturnogo jazyka*. Moscow: Izdatel'stvo akademii nauk SSSR.
- Janda, Laura A. and Charles Townsend (2000) *Czech*. Berlin: Lincom Europa.
- Janhunen, Juha, ed. (2003) *The Mongolic Languages*. London: Routledge.
- Jany, Carmen (2009) *Chimariko grammar: areal and typological perspective*. Berkeley: University of California Press.
- Jaspers, Dany (2005) *Operators in the Lexicon: On the Negative Logic of Natural Language*. Ph.d. dissertation, Leiden University.
- Jelinek, Eloise and Richard A. Demers (1994) Predicates and Pronominal Arguments in Straits Salish. *Language* **70**(4): 697–736.
- Jensen, John Thayer (1977) *Yapese reference grammar*. Honolulu: University of Hawai'i Press.

- Jespersen, Otto (1909-1949) *A modern English grammar on historical principles*. Heidelberg: Carl Winter.
- Johnston, Jason (1997) *Systematic Homonymy and the Structure of Morphological Categories: Some Lessons from Paradigm Geometry*. Ph.D. thesis, University of Sydney.
- Josephs, Lewis S. (1975) *Palauan reference grammar*. Honolulu: University of Hawai'i Press.
- Joüon, Paul and T. Muraoka (2005) *A grammar of biblical Hebrew*. Rome: Editrice Pontificio Istituto Biblico.
- Judge, Anne and F. G. Healey (1983) *A reference grammar of Modern French*. London: E. Arnold.
- Juldashev, A. A. (1966) Baškirkij jazyk. In Vinogradov et al. (1966b), 173–193.
- Julien, Marit (2002) *Syntactic Heads and Word Formation*. Oxford: Oxford University Press.
- Junusaliev, B. M. (1966) Kirgizskij jazyk. In Vinogradov et al. (1966b), 482–505.
- Kachru, Yamuna (2006) *Hindi*. Amsterdam: John Benjamins.
- Kacori, Thoma (1979) *A handbook of Albanian*. Sofia: Sofia University "Kliment Ohridski".

- Kajdarov, A. T. (1966) Ujgurskij (novoujgurskij) jazyk. In Vinogradov et al. (1966b), 363–386.
- Kakumasu, James Y. (1986) Urubu-Kaapor. In Derbyshire and Pullum (1986), 326–403.
- Kangasmaa-Minn, Eeva (1998) Mari. In Abondolo (1998b), 219–248.
- Kari, Ethelbert E. (2000) *Ogbronuagum (the Bukuma language)*. München: Lincom Europa.
- Karlsson, Fred (2008) *Finnish: an essential grammar*. London: Routledge, 2 ed.
- Karpov, B. G. (1966) Khakasskij jazyk. In Vinogradov et al. (1966b), 428–445.
- Karst, Josef (1901) *Historische grammatik des kilikisch-armenischen*. Strassburg: Karl J. Trübner.
- Katsánis, N. and K. Dínas (1990) *Grammatiki tis Koinis Koutsovlachikis*. Thessaloniki: Archeio Koutsovlachikon Meleton.
- Katzir, Roni and Raj Singh (2009) On the Absence of XOR in Natural Language. In *Presuppositions and Implicatures: Proceedings of the MIT-Paris Workshop*, Paul Égré and Giorgio Magri, eds., Cambridge: MITWPL.
- Katzner, Kenneth (1994) *English-Russian Russian-English Dictionary (Revised and Expanded ed.)*. New York: John Wiley and Sons.

- Kayne, Richard (2005) *Movement and silence*. Oxford: Oxford University Press.
- Kearns, Kate (2007) Telic senses of deadjectival verbs. *Lingua* **117**: 26–66.
- Keegan, John (1997) *A reference grammar of Mbay*. München: Lincom Europa.
- Kelly, John (1859) *A Practical Grammar of the Antient Gaelic, or Language of the Isle of Man, Usually Called Manks*. Douglas, Isle of Man: Manx Society.
- Kenesbaev, S. K. and N. B. Karasheva (1966) Kazakhskij jazyk. In Vinogradov et al. (1966b), 320–339.
- Kennedy, Christopher (1997) *Projecting the adjective: The syntax and semantics of gradability and comparison*. Ph.D. thesis, University of California at Santa Cruz.
- Kennedy, Christopher (2007a) Modes of comparison. In *Proceedings of CLS 43*, Malcolm Elliott, James Kirby, Osamu Sawada, Eleni Staraki, and Suwon Yoon, eds., Chicago: Chicago Linguistic Society.
- Kennedy, Christopher (2007b) Vagueness and grammar: the semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy* **30**(1): 1–45.

- Kennedy, Christopher (Forthcoming) Vagueness and comparison. In *Vagueness and language use*, Paul Egré and Nathan Klinedinst, eds., Palgrave Macmillan.
- Kennedy, Christopher and Beth Levin (2008) Measure of change: The adjectival core of degree achievements. In *Adjectives and adverbs: Syntax, semantics and discourse*, Louise McNally and Christopher Kennedy, eds., Oxford: Oxford University Press, 156–182.
- Kennedy, Christopher and Louise McNally (2005) Scale structure and the semantic typology of gradable predicates. *Language* **81**: 345–381.
- Kent, Roland G. (1953) *Old Persian [Second Edition]*. New Haven: American Oriental Society.
- Keresztes, László (1998) Mansi. In Abondolo (1998b), 387–427.
- Kert, Georgij Martynovič (1971) *Saamskij jazyk (kil'dinskij dialekt)*. Nauka.
- Khabichev, M. A. (1966) Karačaevo-balkarskij jazyk. In Vinogradov et al. (1966b), 213–233.
- Khromov, A. L. (1972) *Jagnobskij jazyk*. Moscow: Nauka.
- Kiefer, Ferenc (2001) Morphology and pragmatics. In *The Handbook on Morphology*, Andrew Spencer and Arnold M. Zwicky, eds., Oxford: Blackwell, 272–279.

- Kilian-Hatz, Christa (2008) *A grammar of modern Khwe*. Köln: Rüdiger Köppe Verlag.
- Kim, Stephen S. (2003) Santa. In Janhunen (2003), 346–363.
- Kinchin Smith, F. and T.W. Melliush (1968) *Greek*. London: Hodder and Stoughton.
- Kiparsky, Paul (1973) “Elsewhere” in phonology. In *A Festschrift for Morris Halle*, New York: Holt, Rinehart and Winston, 93–106.
- Kiparsky, Paul (1983) Word formation in the lexicon. In *Proceedings of the 1982 Mid-America Linguistics Conference*, F. Ingemann, ed.
- Kiparsky, Paul (2008) Universals constrain change, change results in typological generalizations. In *Linguistic universals and language change*, Jeff Good, ed., Oxford: Oxford University Press, xx.
- Kipshidze, I. (1914) *Grammatika mingrel'skago (iverskago) jazyka s" xrestomatieju i slovarem"*. Sankt-Peterburg: Imperial Academy of Sciences.
- Kirkeby, Willy A. (1989) *English-Norwegian Dictionary*. Oslo: Norwegian University Press.
- Kiziria, A. I. (1967) Zanski jazyk. In Vinogradov et al. (1967), 62–76.
- Klajn, Ivan (2005) *Gramatika srpskog jezika*. Beograd: Zavod za udžbenike i nastavna sredstva.

- Klamer, Marian (2010) *A grammar of Teiwa*. Berlin: Mouton de Gruyter.
- Klein, Ewan (1991) Comparatives. Berlin: de Gruyter, 673–691.
- Koehn, Edward H. and Sally S. Koehn (1986) Apalaí. In Derbyshire and Pullum (1986), 33–127.
- Kolesnikova, V. D. and O. A. Konstantinova (1968) Negidal'skij jazyk. In Vinogradov et al. (1968), 109–128.
- Koontz-Garboden, Andrew (2009) Anticausativization. *Natural Language and Linguistic Theory* **27**: 77–138.
- Kovedjaeva, E. I. (1966a) Gornomarijskij jazyk. In Vinogradov et al. (1966c), 241–260.
- Kovedjaeva, E. I. (1966b) Lugovo-vostochnyj marijskij jazyk. In Vinogradov et al. (1966c), 221–240.
- Kozintseva, Natalia (1995) *Modern Eastern Armenian*. München: Lincom Europa.
- Krause, Todd B. and Jonathan Slocum (2002-2004) Old Church Slavonic Online. <http://www.utexas.edu/cola/centers/lrc/eieol/ocsol-0-X.html>.
- Krause, Todd B. and Jonathan Slocum (2004) Classical Armenian Online. <http://www.utexas.edu/cola/centers/lrc/eieol/armol-0-X.html>.

- Krause, Todd B. and Jonathan Slocum (2007-2010) Tocharian Online.
<http://www.utexas.edu/cola/centers/lrc/eieol/tokol-0.html>.
- Krejnovich, E. A. (1968) Nivkhskij jazyk. In Vinogradov et al. (1968), 408–434.
- Krippes, Karl A. (1996) *Kazakh Grammar with Affix List*. Kensington, MD: Dunwoody Press.
- Krishnamurti, Bhadriraju (2003) *The Dravidian languages*. Cambridge: Cambridge University Press.
- Kriz, Manuel (2011) *Issues in the Semantics of Degree Achievements*. Mag. diplomarbeit, Universität Wien, Vienna.
- Krueger, John R. (1961) *Chuvash Manual: Introduction, Grammar, Reader and Vocabulary*. Bloomington, IN: Indiana University Publications.
- Kruspe, Nicole (2004) *A Grammar of Semelai*. Cambridge, UK: Cambridge University Press.
- Krymova, N.I., A. Emsina, and G. Moltke (1960) *Datsko-russkij slovar'*. Moscow: Gosudarstvennoe izdatel'stvo inostrannyx i nacional'nyx slovarej.
- Kühner, Raphael and Friedrich Holzweissig (1912) *Ausführliche Grammatik der Lateinischen Sprache, Teil I*. Hahnsche Buchhandlung, 2 ed.
- Kullmann, Rita and D. Tserenpil (1996) *Mongolian Grammar*. Hong Kong: Jenco.

- Kumakhov, M. A. (1967) Adygejskij jazyk. In Vinogradov et al. (1967), 145–164.
- Künnap, Ago (1999) *Kamass*. München: Lincom.
- Kuo, Cheng-chuen (2008) *Comparative constructions in Amis*. Master's thesis, National Taiwan University.
- Kuryłowicz, Jerzy (1964) *The inflectional categories of Indo-European*. Heidelberg: Carl Winter.
- Kuznecova, A.I. and T.F. Efremova (1986) *Slovar' morfem ruskogo jazyka*. Moscow: Russkij jazyk.
- Kytö, Merja and Suzanne Romaine (1997) Competing forms of adjective comparison in Modern English: what could be more quicker, easier and more effective? In *To Explain the Present: Studies in the Changing English Language in Honour of Matti Rissanen*, T. Nevalainen and L. Kahlas-Tarkka, eds., Helsinki: Société Néophilologique, 329–352.
- Laakso, Johanna (2001) The Finnic languages. In *The Circum-Baltic languages: Typology and Contact*, vol. 1, Östen Dahl and Maria Koptjevskaja-Tamm, eds., John Benjamins, 179–212.
- Labouret, H. (1952) *La langue des peuls ou foubé*. Dakar: IFAN.
- Lamb, William (2003) *Scottish Gaelic*. München: Lincom Europa.

- Landaburu, Jon (1979) *La langue des andoke (Amazonie colombienne): Grammaire*. Paris: CNRS.
- Lechner, Winfried (2004) *Ellipsis in Comparatives*. Berlin: Mouton de Gruyter.
- Lehmann, Winfred P. and Jonathan Slocum (2005) Hittite Online. <http://www.utexas.edu/cola/centers/lrc/eieol/hitol-0-X.html>.
- Lermontov, Michail Yuryevich (1832) Parus [The Sail].
- Leskien, A. (1962) *Handbuch der albulgarischen (altkirchenslavischen) Sprache*. Heidelberg: Carl Winter Universitätsverlag.
- Levin, Beth (1993) *English Verb Classes and Alternations: A preliminary investigation*. Chicago: University of Chicago Press.
- Levinson, Steven C. (1988) Putting linguistics on a proper footing: Explorations in Goffman's concepts of participation. In *Erving Goffman: Exploring the interaction order*, Paul Drew and Anthony Wootton, eds., Oxford: Polity Press, 161–227.
- Lewis, Charlton T. and Charles Short (1879) *A Latin Dictionary*. Oxford: Clarendon Press.
- Lewis, David (1970) General Semantics. *Synthese: An international journal for epistemology, methodology and philosophy of science* **22**: 18–67.
- Lewis, G. L. (1967) *Turkish Grammar*. Oxford: Oxford University Press.

- Lewis, Henry and Holger Pedersen (1937) *A concise comparative Celtic grammar*. Göttingen: Vandenhoeck and Ruprecht.
- Li, Charles N. and Sandra A. Thompson (1981) *Mandarin Chinese: A functional reference grammar*. Berkeley: University of California Press.
- Lichtenberk, Frantisek (1983) *A Grammar of Manam*. Honolulu, HI, HI: University of Hawaii Press.
- Liddell, Henry George and Robert Scott (1996) *Greek-English Lexicon*. Oxford: Clarendon Press, 9 ed.
- Lieber, Rochelle (1980) *On the organization of the lexicon*. Ph.D. thesis, Massachusetts Institute of Technology.
- Lieber, Rochelle (1982) Allomorphy. *Linguistic Analysis* **10**(1): 27–52.
- Lomtatidze, Ketevan V. (1967a) Abazinskij jazyk. In Vinogradov et al. (1967), 123–144.
- Lomtatidze, Ketevan V. (1967b) Abkhazskij jazyk. In Vinogradov et al. (1967), 101–122.
- Louwrens, Louis J., Ingeborg M. Kosch, and Albert E. Kotzé (1995) *Northern Sotho*. München: Lincom Europa.
- Lukas, Johannes (1937) *A Study of the Kanuri Language*. Oxford: Oxford University Press.

- Lukoff, Fred (1993) *An introductory course in Korean*. Seoul: Yonsei University Press.
- Lunt, Horace G. (1952) *A grammar of the Macedonian Literary Language*. Skopje: Državno knigoizdatelstvo na N.R. Makedonija.
- Lunt, Horace G. (1959) *Old Church Slavonic Grammar*. 's-Gravenhage: Mouton and Co.
- Lytkin, V. I. (1966) Komi-zyrjanskij jazyk. In Vinogradov et al. (1966c), 281–299.
- Macaulay, Monica Ann (1996) *A Grammar of Chalcatongo Mixtec*. Berkeley; Los Angeles: University of California Press.
- Mace, John (2003) *Persian Grammar*. London: Routledge Curzon.
- MacKay, Carolyn J. (1999) *A Grammar of Misantra Totonac*. Salt Lake City: University of Utah Press.
- Madieva, G. I. (1967) Avarskij jazyk. In Vinogradov et al. (1967), 255–271.
- Magomedbekova, E. M. (1967a) Karatinskij jazyk. In Vinogradov et al. (1967), 322–335.
- Magomedbekova, E. M. (1967b) Čamalinskij jazyk. In Vinogradov et al. (1967), 384–399.

- Magomedov, A. G. (1966) Kumykskij jazyk. In Vinogradov et al. (1966b), 194–212.
- Magometov, A. A. (1965) *Tabasaranskij jazyk*. Tbilisi: Metsniera.
- Maiden, Martin (2005) Morphological autonomy and diachrony. In *Yearbook of Morphology 2004*, Geert Booij and Jaap van Marle, eds., Dordrecht: Kluwer, 137–175.
- Malchukov, Andrej L. (1995) *Even*. München: Lincom Europa.
- Marantz, Alec (1989) Clitics and phrase structure. In *Alternative Conceptions of Phrase Structure*, Mark Baltin and Anthony Kroch, eds., Chicago: The University of Chicago Press, 99–116.
- Marantz, Alec (1996) ‘Cat’ as a phrasal idiom, ms. MIT.
- Marantz, Alec (1997) No Escape from Syntax: Don’t Try Morphological Analysis in the Privacy of Your Own Lexicon. In *Proceedings of the 21st Penn Linguistics Colloquium*, vol. 4, Alexis Dimitriadis, Laura Siegel, Clarissa Surek-Clark, and Alexander Williams, eds., Philadelphia: U Penn Working Papers in Linguistics, 201–225.
- Marantz, Alec (2007) Phases and words. In *Phases in the theory of grammar*, Sook-Hee Choe, ed., Seoul: Dong In, 199–222.
- Marr, N. Ja. (1910) *Grammatika chanskago (lazskago) jazyka s" xrestomatieju i slovarem"*. Sankt-Peterburg: Imperatorskaja Akademija Nauk.

- Martin, Samuel Elmo (2004) *A reference grammar of Japanese*. Honolulu: University of Hawai'i Press.
- Maslova, Elena (2003) *A Grammar of Kolyma Yukaghir*. Berlin; New York: Mouton de Gruyter.
- Matisoff, James A. (1973) *The grammar of Lahu*. Berkeley: University of California Press.
- Matras, Yaron (2002) *Romani: A Linguistic Introduction*. Cambridge: Cambridge University Press.
- Matthews, P.H. (1972) *Inflectional Morphology: A theoretical study based on aspects of Latin verb conjugation*. Cambridge: Cambridge University Press.
- Matthews, P.H. (1991) *Morphology*. Cambridge: Cambridge University Press, 2 ed.
- Matthews, Stephen and Virginia Yip (1994) *Cantonese: A Comprehensive Grammar*. London: Routledge.
- Mayo, Peter (1993) Belorussian. In Comrie and Corbett (1993), 887–946.
- Mc Laughlin, Fiona (2004) Is there an adjective class in Wolof. In *Adjective classes: A cross-linguistic typology*, R.M.W. Dixon and Alexandra Y. Aikhenvald, eds., Oxford: Oxford University Press, 242–262.
- McGregor, R. S. (1972) *Outline of Hindi Grammar*. Oxford: Clarendon Press.

- Meeuwis, Michael (1998) *Lingala*. München: Lincom Europa.
- Meinhof, Karl (1909) *Lehrbuch der Nama-sprache*. Berlin: Georg Reimer.
- Mel'čuk, Igor A. (1994) Suppletion: Toward a Logical Analysis of the Concept. *Studies in Language* **18**(2): 339–410.
- Mel'čuk, Igor A. (2006) *Aspects of the Theory of Morphology*. 2, Berlin: Mouton de Gruyter.
- Merchant, Jason (2009) Phrasal and clausal comparatives in Greek and the abstractness of syntax. *Journal of Greek Linguistics* **9**: 134–164.
- Merchant, Jason (to appear) Genitives of comparison in Greek. In *Proceedings of ICGL9*, Katerina Chatzopoulou, Alexandra Ioannidou, and Suwon Yoon, eds.
- Migeod, Frederick William Hugh (1914) *A grammar of the Hausa language*. London: Kegan Paul, Trench, Trubner & Co.
- Milne, Leslie (1921) *An Elementary Palaung Grammar*. Oxford: Clarendon Press.
- Mitxelena, Koldo (1988) *Euskal idazlan guztiak*. Donostia: Euskal Editoreen Elkartea [9 vols.].
- Mixco, Mauricio J. (2000) *Kiliwa*. München: Lincom Europa.

- von Möllendorff, P. G. (1892) *A Manchu Grammar*. Shanghai: American Presbyterian Mission Press.
- Morev, L. N., A. A. Moskalev, and Ju. Ja. Plam (1972) *Laoskij jazyk*. Moscow: Nauka.
- Munro, Pamela and Dieynaba Gaye (1991) *Ay baati Wolof: a Wolof dictionary*. Los Angeles: UCLA Occasional Papers in Linguistics.
- Musaev, K. M. (1966) Karaimskij jazyk. In Vinogradov et al. (1966b), 260–279.
- Musan, Renate (2002) *The German Perfect: Its semantic composition and its interaction with temporal adverbials*. Dordrecht: Kluwer.
- Nagayama, Yukari (2003) *Očerk grammatiki aljutorskogo jazyka [Endangered Languages of the Pacific Rim A2-038]*. Kyoto: Nakanishi Printing Co.
- Nandris, Grigoe (1986) *Colloquial Rumanian*. London: Routledge.
- Nash, David (1980) *Topics in Warlpiri Grammar*. Ph.D. thesis, M.I.T., Cambridge.
- Nau, Nicole (1992) Der ostseefinnische Superlativ im arealen Kontext. *Finnisch-ugrische Mitteilungen* **16/17**: 13–23.
- Nedjlkov, Igor (1997) *Evenki*. London: Routledge.

- Neeleman, Ad and Kriszta Szendrői (2007) Radical Pro Drop and the Morphology of Pronouns. *Linguistic Inquiry* **38**(4): 671–714.
- Neukom, Lukas (2001) *Santali*. München: Lincom Europa.
- Nevins, Andrew (2007) The representation of third person and its consequences for the person-case constraint. *Natural Language and Linguistic Theory* **25**(2): 273–313.
- Nichols, Johanna (2011) *Ingush Grammar*. Berkeley: University of California Press.
- Nichols, Johanna (n.d.) Chechen. Unpublished manuscript at <http://ingush.narod.ru/chech/book/>.
- Nickel, Klaus Peter (1990) *Samisk grammatikk*. Universitetsforlaget.
- Nicklas, T. Dale (1979) *Reference grammar to the Choctaw Language*. Durant, Okla.: Choctaw Bilingual Education Program, Southeastern Oklahoma State University.
- Noonan, Michael P. (1992) *A Grammar of Lango*. Berlin; New York: Mouton de Gruyter.
- Noreen, Adolf (1923) *Altisländische und altnorwegische Grammatik (Laut- und Flexionslehre) unter Berücksichtigung des Urnordischen*. Halle: M. Niemeyer.

- Noyer, Rolf (1997) *Features, positions and affixes in autonomous morphological structure*. New York: Garland.
- Noyer, Rolf (1998) Impoverishment theory and morphosyntactic markedness. In *Morphology and its Relation to Phonology and Syntax*, Steven G. Lapointe, Diane Brentari, and Patrick Farrell, eds., Palo Alto: CSLI, 264–285.
- Nugteren, Hans (2003) Shira Yughur. In Janhunen (2003), 265–285.
- Oda, Toshiko (2008) *Degree constructions in Japanese*. Ph.D. thesis, University of Connecticut.
- Odhner, John D. (1981) *English-Lingala manual*. Landham, MD, USA: University Press of America.
- O’Herin, Brian (1995) *Case and agreement in Abaza*. Ph.D. thesis, University of California at Santa Cruz.
- Ohtaki, Koichi (2010) The Syntax-Lexicon Interface in the Acquisition of English Comparative Morphology. In *Proceedings of the 2009 Mind/Context Divide Workshop*, Michael Iverson, Ivan Ivanov, Tiffany Judy, Jason Rothman, Roumyana Slabakova, and Marta Tryzna, eds., Somerville: Cascadia Press, 96–103.
- Olawsky, Knut J. (2006) *A Grammar of Urarina*. Berlin; New York: Mouton de Gruyter.

- Országh, László (1988) *Angol-Magyar / Magyar-Angol Szótár [16th ed.]*. Budapest: Akadémiai Kiadó.
- O'Siadhail, Michael (1989) *Modern Irish: Grammatical structure and dialect variation*. Cambridge: Cambridge University Press.
- Osthoff, Hermann (1888) Etymologica I. *Beiträge zur Geschichte der deutschen Sprache und Literatur* **13**: 395–463.
- Osthoff, Hermann (1899) *Vom Suppletivwesen der indogermanischen Sprache*. Heidelberg: J. Hörning.
- Pakhalina, T. N. (1966) Vakhanskij jazyk. In Vinogradov et al. (1966a), 398–418.
- Pandharipande, Rajeshwari (1997) *Marathi*. London; York: Routledge.
- Paul, Ludwig (2009) Zazaki. In Windfuhr (2009), 545–586.
- Payne, Doris L. and Thomas Payne (1990) Yagua. In *Handbook of Amazonian Languages vol. 2*, vol. 3, Desmond C. Derbyshire and Geoffrey K. Pullum, eds., Berlin: Mouton de Gruyter, 249–474.
- Pederson, Donald Leslie (1977) *Grammatical structures of Guaraní*. Master's thesis, University of Southern California, Los Angeles.
- Penka, Doris (2007) *Negative indefinites*. Ph.D. thesis, Universität Tübingen.

- Pensalfini, Robert (2003) *A Grammar of Jingulu*. Canberra: Pacific Linguistics.
- Perini, Mário A. (2002) *Modern Portuguese: A reference grammar*. New Haven: Yale University Press.
- Pertsova, Katya (2007) *Learning form-meaning mappings in presence of homonymy*. Ph.D. thesis, UCLA, Los Angeles.
- Pertsova, Katya (2011) Grounding systematic syncretism in learning. *Linguistic Inquiry* **42**(2): 225–266.
- Pesetsky, David (1985) Morphology and Logical Form. *Linguistic Inquiry* **16**(2): 193–246.
- Pesetsky, David (1995) *Zero Syntax: Experiencers and Cascades*. Cambridge: MIT Press.
- Petrova, T. I. (1967) *Jazyk orokov (Ul'ta)*. Leningrad: Nauka.
- Phillips, John D. (2004) *Manx*. München: Lincom Europa.
- Pinker, Steven (1984) *Language Learnability and Language Development*. Cambridge: MIT Press.
- Pirejko, L. A. (1966) Talyschskij jazyk. In Vinogradov et al. (1966a), 302–322.
- Pobożniak, Tadeusz (1964) *Grammar of the Lovari dialect*. Kraków: Państwowe wydawnictwo naukowe.

- Pokrovskaja, L. A. (1966) Gagauzskij jazyk. In Vinogradov et al. (1966b), 112–138.
- Poppe, Nicholas (1964) *Bashkir Manual: Descriptive Grammar and Texts with A Bashkir-English Glossary*. Bloomington, IN, USA, and the Netherlands: Indian University and Mouton &Co., the Hague.
- Poser, William J. (1992) Blocking of phrasal constructions by lexical items. In *Lexical Matters*, Ivan Sag and Anna Szabolcsi, eds., Stanford: CSLI, 111–130.
- Poulos, George and Christian T. Msimang (1998) *A linguistic analysis of Zulu*. Cape Town: Via Afrika.
- Pratico, Gary D. and Miles V. Van Pelt (2009) *Basics of Biblical Hebrew Grammar*. Grand Rapids, Mich.: Zondervan.
- Prisma (1995) *Prisma's Swedish-English and English-Swedish Dictionary (Third Ed.)*. Minneapolis: University of Minnesota Press.
- Prokofjeva, E. D. (1966) Seljkupskij jazyk. In Vinogradov et al. (1966c), 396–415.
- Pulte, William and Durbin Feeling (1975) *Outline of Cherokee Grammar*. Tahlequah: Cherokee Nation of Oklahoma.
- Quick, Phil (2007) *A Grammar of the Pendau Language of central Sulawesi*,

- Indonesian*. Canberra, Australia: Pacific Linguistics, Research School of Pacific and Asian Studies, The Australian National University.
- Radkevich, Nina (2010) *On Location: The structure of case and adpositions*. Ph.D. thesis, University of Connecticut.
- Ramchand, Gillian Catriona (2008) *Verb Meaning and the Lexicon: A First Phase Syntax*. Cambridge: Cambridge University Press.
- Rastorgueva, V. S. (1963) *A short sketch of Tajik grammar*. Bloomington and the Hague: Indiana University and Mouton and Co.
- Rastorgueva, V. S. (1966) Beludžskij jazyk. In Vinogradov et al. (1966a), 323–341.
- Rastorgueva, V. S., A. A. Kerimova, A. K. Mamedzade, L. A. Pirejko, and D. I. Edel'man (1971) *Giljanskij jazyk*. Moscow: Nauka.
- Raun, Alo (1949) Zum Komparativ und Superlativ im Livischen. *Finnsich-ugrischen Forschungen* **30**: 231–241.
- Redei, Karoly (1965) *Northern Ostyak Chrestomathy*. Indiana University Publications.
- Refsing, Kirsten (1986) *The Ainu language*. Aarhus: Aarhus University Press.
- Reiter, Norbert (1979) *Komparative*. Wiesbaden: Harrassowitz.
- Rennison, John R. (1997) *Koromfe*. London: Routledge.

- Reshetov, V. V. (1966) Uzbekskij jazyk. In Vinogradov et al. (1966b), 340–362.
- Rett, Jessica (2008) *Degree modification in natural language*. Ph.D. thesis, Rutgers University.
- Rhys Jones, T. J. (1977) *Teach Yourself Living Welsh*. Sevenoaks, Kent: Hodder and Stoughton.
- Rießler, Michael (2007) Grammatical borrowing in Kildin Saami. In *Grammatical borrowing in cross-linguistic perspective*, Yaron Matras and Jeanette Sakel, eds., Berlin: Walter de Gruyter, 229–244.
- Riggs, Elias (1856) *A grammar of the Modern Armenian language as spoken in Constantinople and Asia Minor*. Constantinople: A. B. Churchill, 2 ed.
- Rijk, Rudolf P. G. de (2008) *Standard Basque*. Cambridge: MIT Press.
- Rjagoev, Vladimir Dmitrievich (1977) *Tixvinskij govor karel'skogo jazyka*. Leningrad: Nauka.
- Roberts, John (1987) *Amele*. Beckenham: Croom Helm.
- Robinson, Charles Henry (1897) *Hausa grammar with exercises, readings and vocabulary*. London.
- Robson, Barbara and Habibullah Tegey (2009) Pashto. In Windfuhr (2009), 721–772.

- Rogava, G. V. and Z. I. Kerasheva (1966) *Grammatika adygejskogo jazyka*. Krasnodar: Krasnodarskoe knizhnoe izdatel'stvo.
- Rombandeeva, E. I. (1966) Mansijskij jazyk. In Vinogradov et al. (1966c), 343–360.
- Rossini, Carlo Conti (1912) *La langue des kemant en Abyssine*. Wien: Alfred Hölder.
- Rothstein, Robert A. (1993) Polish. In Comrie and Corbett (1993), 686–758.
- Rothstein, Susan (2004) *Structuring Events*. Malden, Mass.: Blackwell.
- Rotstein, Carmen and Yoad Winter (2004) Total adjectives vs. partial adjectives: Scale structure and higher-order modifiers. *Natural Language Semantics* **12**: 259–288.
- Rullmann, Hotze (1995) *Maximality in the semantics of wh-constructions*. Ph.D. thesis, University of Massachusetts, Amherst.
- Rybatzki, Volker (2003) Middle Mongol. In Janhunen (2003), 57–82.
- Ryding, Karin C. (2005) *A reference grammar of modern standard Arabic*. Cambridge: Cambridge University Press.
- Saeed, John I. (1999) *Somali*. Amsterdam; Philadelphia: John Benjamins Publishing Company.
- Sakel, Jeanette (2004) *Mosetén*. Berlin: Mouton de Gruyter.

- Sala, Antonio Maria (1914) Essai de Grammaire kaiapó, langue des Indiens kaiapó, Brésil. *Anthropos* **9**: 233–240.
- Salminen, Tapani (1998) Nenets. In Abondolo (1998b), 516–547.
- Sammallahti, Pekka (1998) Saamic. In Abondolo (1998b), 43–95.
- Sapir, Edward (1944) Grading: A Study in Semantics. *Philosophy of Science* **11**: 93–116.
- Sassoon, Galit Weidman (2007) *Vagueness, gradability and typicality, a comprehensive semantic analysis*. Ph.d. dissertation, Tel Aviv University.
- Sassoon, Galit Weidman (2010) The degree functions of negative adjectives. *Natural Language Semantics* **18**: 141–181.
- Sat, Sh. Ch. (1966) Tuvinskij jazyk. In Vinogradov et al. (1966b), 387–402.
- Schmidt, Karl Horst (1991) Svan. In Harris (1991a), 473–556.
- Schön, James Frederick (1862) *Grammar of the Hausa language*. London: Church Missionary House.
- Schulz, Ekehard, Günther Krahl, and Wolfgang Reuschel (2000) *Standard Arabic: An elementary - intermediate course*. Cambridge: Cambridge University Press.
- Schulze, Wolfgang (2000) *Northern Talysh*. München: Lincom Europa.

- Schuster-Šewc, Hinc (1996) *Grammar of the Upper Sorbian Language*. München: Lincom Europa.
- Schwarzschild, Roger (2008) The Semantics of Comparatives and Other Degree Constructions. *Language and Linguistics Compass* **2**(2): 308–331.
- Schweiger, Fritz (1984) Comparative: a neglected category in Australian linguistics. *Working papers in language and linguistics* **18**: 28–38.
- Schweizer, Bruno (2008) *Zimbrische Gesamtgrammatik*. Stuttgart: Franz Steiner Verlag.
- Seiler, Andreas (1830) *Kurzgefasste Grammatik der sorben-wendischen Sprache nach dem Budissiner Dialekte*. Budissin: K. A. F. Weller.
- Seiler, Hansjakob (1950) *Die primären griechischen Steigerungsformen*. Hamburg: Hansischer Gildenverlag.
- Seuren, Pieter (1973) The comparative. In *Generative Grammar in Europe*, Ferenc Kiefer and Nicolas Ruwet, eds., Dordrecht: Riedel, 528–564.
- Seuren, Pieter (1984) The comparative revisited. *Journal of Semantics* **3**: 109–141.
- Shagirov, A. K. (1967) Kabardinskij jazyk. In Vinogradov et al. (1967), 165–193.
- Shaha, Brojo Nath (1884) *A grammar of the Lúshái language*. Calcutta: Bengal Secretariat Press.

- Shevelov, George Y. (1993) Ukrainian. In Comrie and Corbett (1993), 947–998.
- Shixuan, Xu (2001) *The Bisu language*. München: Lincom Europa.
- Short, David (1993) Slovak. In Comrie and Corbett (1993), 533–592.
- Siegel, Dorothy (1978) The Adjacency Constraint and the theory of Morphology. In *Proceedings of NELS 8*, M. Stein, ed., Amherst: GLSA, 189–197.
- Sievers, Eduard (1882) *Angelsächsische Grammatik*. Halle: Max Niemeyer.
- Silverstein, Michael (1976) Feature hierarchies and Ergativity. In *Grammatical categories in Australian languages*, Richard M.W. Dixon, ed., Canberra: Australian Institute of Aboriginal Studies, 112–171.
- Simon, Horst (2005) Only *you*? Philological investigations into the alleged inclusive-exclusive distinction in the secon person plural. In *Clusivity*, Elena Filimonova, ed., Amsterdam: John Benjamins, 113–150.
- Simpson, Jane (1983) *Aspects of Warlpiri morphology and syntax*. Ph.D. thesis, M.I.T., Cambridge.
- Simpson, Jane and Meg Withgott (1986) Pronominal Clitic Clusters and Templates. In *The syntax of pronominal clitics, Syntax and Semantics*, vol. 19, Hagit Borer, ed., New York: Academic Press, 149–174.
- Sjoberg, Andrée F. (1962) *Uzbek structural grammar*. Bloomington and the Hague: Indiana University and Mouton &Co.

- Skjærvø, Prods Oktor (2009a) Middle West Iranian. In Windfuhr (2009), 196–278.
- Skjærvø, Prods Oktor (2009b) Old Iranian. In Windfuhr (2009), 43–195.
- Skorik, Piotr Ja. (1961) *Grammatika čukotskogo jazyka, čast' I: fonetika i morfoložija imennyx častej reči*, vol. 1. Moscow: Izdatel'stvo akademii nauk SSSR.
- Skorik, Piotr Ja. (1968) Kerekskij jazyk. In Vinogradov et al. (1968), 310–333.
- Skorik, Piotr Ja. (1977) *Grammatika čukotskogo jazyka*, vol. 2. Leningrad: Nauka.
- Skribnik, Elena (2003) Buryat. In Janhunen (2003), 102–128.
- Smeets, Ineke (2007) *A Grammar of Mapuche*. Berlin; New York: Mouton de Gruyter.
- Smythe, W.E. (1948) Elementary Grammar of the Gumbáinggar Language (North Coast, N.S.W.). *Oceania* **19**(2): 130–191.
- Sofroniou, S.A. (1962) *Teach Yourself Modern Greek*. London: Hodder and Stoughton.
- Sokolova, V. S. (1966) Šugnano-rušanskaja jazykovaja gruppa. In Vinogradov et al. (1966a), 362–397.

- Sokolovskaja, N. K. (1980) Nekotorye semantičeskie universalii v sisteme ličnyx mestoimenij. In *Teorija i tipologija mesoimenij*, I. F. Vardul', ed., Moscow: Nauka, 84–102.
- Sproat, Richard William (1985) *On Deriving the Lexicon*. Ph.D. thesis, M.I.T.
- Stanojčić, Živojin and Ljubomir Popović (1992) *Gramatika srpskog jezika*. Beograd: Zavod za udžbenike i nastavna sredstva.
- Stassen, Leon (1985) *Comparison and Universal Grammar*. Oxford: Basil Blackwell.
- Stassen, Leon (2008) Comparative constructions. In *World Atlas of Language Structures Online*, Martin Haspelmath, Matthew S. Dryer, David Gil, and Bernard Comrie, eds., chap. 121, Max Planck Digital Library, <http://wals.info/feature/121>.
- Stateva, Penka (2002) *How different are different degree constructions?* Ph.D. thesis, University of Connecticut.
- Stateva, Penka (2005) Presuppositions in superlatives, ms. ZAS, Berlin.
- von Stechow, Arnim (1984) Comparing semantic theories of the comparative. *Journal of Semantics* **3**: 1–77.
- Steele, Susan (1987) Review of Stassen (1985). *Language* **63**(3): 629–632.

- Steere, Edward LL.D. (1884) *A Handbook of the Swahili Language as spoken at Zanzibar*. London: Society for Promoting Christian Knowledge.
- Steever, Sanford B., ed. (1998a) *The Dravidian languages*. London: Routledge.
- Steever, Sanford B. (1998b) Introduction to the Dravidian languages. In Steever (1998a), 1–39.
- Strandskogen, Åse-Berit and Rolf Strandskogen (1986) *Norwegian: An essential grammar*. London: Routledge.
- Street, John C. (1963) *Khalkha structure*. Bloomington and the Hague: Indiana University and Mouton & Co.
- Strehlow, T. G. H. (1942) Aranda grammar. *Oceania* **13**(1): 71–103.
- Stump, Gregory T. (2001) *Inflectional Morphology: A theory of paradigm structure*. Cambridge: Cambridge University Press.
- Sunik, O. P. (1968a) Udègejskij jazyk. In Vinogradov et al. (1968), 210–232.
- Sunik, O. P. (1968b) Ul'čskij jazyk. In Vinogradov et al. (1968), 149–171.
- Svantesson, Jan-Olof (2003) Khalkha. In Janhunen (2003), 154–176.
- Swadesh, Mauricio (1969) *Elementos del tarasco antiguo*. México: Universidad nacional autónoma de México.

- Szabolcsi, Anna (1986) Comparative superlatives. In *MIT Working Papers in Linguistics*, vol. 8, Naoki Fukui, Tova R Rapoport, and Elizabeth Sagey, eds., 245–265.
- Tabulova, N.T. (1976) *Grammatika abazinskogo jazyka: fonetika i morfologija*. Cherkessk: Karachaevo-Cherkesskoe otdelenie Stavropol'skogo knizhnogo izdatel'stva.
- Takahashi, Masahiko (2011) *Some theoretical consequences of Case-marking in Japanese*. Ph.D. thesis, University of Connecticut, Storrs.
- Tamura, Suzuko (2000) *The Ainu language*. Tokyo: Sanseido.
- Tarasenkova, Oksana (2010) *Acquisition of Agreement and Morphological Features Within the Noun Phrase in Russian*. Ph.D. thesis, University of Connecticut, Storrs.
- Tasseva-Kurktchieva, Mila (2006) The Categorical Status of Quantifiers in Bulgarian: Evidence for DP over QP. In *Proceedings of FASL 14: The Princeton Meeting*, James Lavine, Steven Franks, Mila Tasseva-Kurktchieva, and Hana Filip, eds., Ann Arbor: Michigan Slavic Publications, 378–393.
- Tauberschmidt, Gerhard (1999) *A Grammar of Sinaugoro*. Canberra, Australia: Pacific Linguistics, Research School of Pacific and Asian Studies, The Australian National University.

- Tauli, Valter (1973) *Standard Estonian Grammar, Part I: Phonology, morphology, word-formation*. Uppsala: Almqvist and Wiksell.
- Tauli, Valter (1983) *Standard Estonian Grammar, Part II: Syntax*. Uppsala: Uppsala University.
- Taylor, F. W. (1921) *A first grammar of the Adamawa dialect of the Fulani language*. Oxford: Clarendon Press.
- Tegey, Habibullah and Barbara Robson (1996) *A reference grammar of Pashto*. Washington: Center for Applied Linguistics.
- Teng, Stacy Fang-Ching (2008) *A reference grammar of Puyuma*. Canberra: Pacific Linguistics.
- Tenny, Carol (1987) *Grammaticalizing Aspect and Affectedness*. Ph.D. thesis, MIT, Cambridge.
- Tenny, Carol (1994) *Aspectual roles and the syntax-semantics interface*. Dordrecht: Kluwer Academic Publishers.
- Tepljashina, T. I. (1966) Udmurtskij jazyk. In *Jazyki narodov S.S.S.R. t. III: Finno-ugorskie i samodijskie jazyki*, V. V. Vinogradov, ed., Moscow: Nauka, 261–280.
- Tereshchenko, N. M. (1966) Nganasanskij jazyk. In Vinogradov et al. (1966c), 416–437.
- Tereshchenko, N. M. (1979) *Nganasanskij jazyk*. Moscow: Nauka.

- Ternes, Elmar (1970) *Grammaire structurale du breton de l'île de Groix*. Carl Winter Universitätsverlag.
- Thackston, Wheeler M. (2006a) *Kurmanji Kurdish: A Reference Grammar with Selected Readings*, ms. Harvard.
- Thackston, Wheeler M. (2006b) *Sorani Kurdish: A Reference Grammar with Selected Readings*, ms. Harvard.
- Thompson, Laurence C (1987) *A Vietnamese Reference Grammar*. Honolulu.: University of Hawaii Press.
- Thompson, Sandra A., Joseph Sung-Yul Park, and Charles N. Li (2006) *A reference grammar of Wappo*. Berkeley: University of California Press.
- Thráinsson, Höskuldur (2010) Predictable and unpredictable sources of variable verb and adverb placement in Scandinavian. *Lingua* **120**(5): 1062–1088.
- Thráinsson, Höskuldur, Hjalmar P. Petersen, Jógvan í Lon Jacobsen, and Zakaris Svabo Hansen (2004) *Faroese: An overview and reference grammar*. Tórshavn: Føroya Fróðskaparfelag.
- Thurneysen, Rudolf (1909) *Handbuch des Alt-Irischen*. Heidelberg: Carl Winter.
- Tiersma, Pieter Meijes (1985) *Frisian reference grammar*. Dordrecht: Foris.

- Tisserant, Charles (1930) *Essai sur la grammaire Banda*. Paris: Institut d'ethnologie.
- Todaeva, B. Kh. (1968) Kalmykskij jazyk. In Vinogradov et al. (1968), 34–52.
- Tompa, József (1968) *Ungarische Grammatik*. Berlin: Mouton.
- Topuria, B. T. (1967) Svanskij jazyk. In Vinogradov et al. (1967), 77–94.
- Trask, R. L. (1997) *The history of Basque*. London: Routledge.
- Trask, R.L. (2003) The Noun Phrase: nouns, determiners and modifiers; pronouns and names. In *A grammar of Basque*, José Ignacio Hualde and Jon Ortiz de Urbina, eds., Berlin: Mouton, 113–170.
- Travis, Lisa deMena (1984) *Parameters and Effects of Word Order Variation*. Ph.D. thesis, MIT, Cambridge.
- Trommer, Jochen (1999) Morphology consuming syntax's resources: Generation and parsing in a Minimalist version of Distributed Morphology.
- Tsertsvadze, I. I. (1967) Andijskij jazyk. In Vinogradov et al. (1967), 276–292.
- Tsintsius, V. I. (1982) *Negidal'skij jazyk*. Leningrad: Nauka.
- Tsumagari, Toshiro (2003) Dagur. In Janhunen (2003), 129–153.
- Ultan, Russell (1972) Some features of basic comparative constructions. *Working papers on language universals* 9: 117–162.

- Underwood, Horace Grant (1914) *An introduction to the Korean spoken language*. New York: MacMillan, 2 ed.
- University of Latvia (1999) *Latvian Grammar* (online).
<http://www.ailab.lv/valoda/v1.htm>.
- Usmanova, M. G. (2007) *Grammatika baškirskogo jazyka*. Ufa: Kitap.
- Vajda, Edward J. (2004) *Ket*. München: Lincom Europa.
- Valentine, Randy (2001) *Nishnaabemwin reference grammar*. Toronto: University of Toronto Press.
- Vall, M. N. and I. A. Kanakin (1990) *Očerki fonologii i grammatiki ketskogo jazyka*. Novosibirsk: Nauka.
- Vasiliauskiene, Virginija and Jonathan Slocum (2005-2007) *Baltic Online*.
<http://www.utexas.edu/cola/centers/lrc/eieol/armol-0-X.html>.
- Vasmer, Max (1953-1958) *Russisches etymologisches Wörterbuch*. Heidelberg: Carl Winter.
- Veselinova, Ljuba N. (2006) *Suppletion in verb paradigms*. Amsterdam: John Benjamins.
- Viitso, Tiit-Rein (1998) *Estonian*. In Abondolo (1998b), 115–148.
- Vincent, Nigel and Kersti Börjars (1996) *Suppletion and syntactic theory*. In *The Proceedings of the LFG '96 conference*,

- Miriam Butt and Tracy Holloway King, eds., Stanford: CSLI,
<http://csli-publications.stanford.edu/LFG/1/VincentBorjars.html>.
- Vinogradov, V. V., B. A. Serebrennikov, N. A. Baskakov, Ju. D. Desheriev,
P. Ja. Skorik, and V. F. Beljaev, eds. (1966a) *Jazyki narodov S.S.S.R. t. I: indo-evropejskie jazyki*, vol. 1. Moscow: Nauka.
- Vinogradov, V. V., B. A. Serebrennikov, N. A. Baskakov, Ju. D. Desheriev,
P. Ja. Skorik, and V. F. Beljaev, eds. (1966b) *Jazyki narodov S.S.S.R. t. II: tjurkskie jazyki*, vol. 2. Moscow: Nauka.
- Vinogradov, V. V., B. A. Serebrennikov, N. A. Baskakov, Ju. D. Desheriev,
P. Ja. Skorik, and V. F. Beljaev, eds. (1966c) *Jazyki narodov S.S.S.R. t. III: Finno-ugorskie i samodijskie jazyki*, vol. 3. Moscow: Nauka.
- Vinogradov, V. V., B. A. Serebrennikov, N. A. Baskakov, Ju. D. Desheriev,
P. Ja. Skorik, and V. F. Beljaev, eds. (1967) *Jazyki narodov S.S.S.R. t. IV: iberijsko-kavkazskie jazyki*, vol. 4. Moscow: Nauka.
- Vinogradov, V. V., B. A. Serebrennikov, N. A. Baskakov, Ju. D. Desheriev,
P. Ja. Skorik, and V. F. Beljaev, eds. (1968) *Jazyki narodov S.S.S.R. t. V: Mongol'skie, tunguso-manžurskie i paleoaziatskie jazyki*, vol. 5. Moscow: Nauka.
- Volodin, Aleksandr P. (1976) *Itel'menskij jazyk*. Leningrad: Nauka.
- Vondrák, Václav (1900) *Altkirchenslavische Grammatik*. Berlin: Weidmannsche Buchhandlung.

- van der Voort, Hein (2004) *A Grammar of Kwaza*. Berlin: Mouton de Gruyter.
- Wali, Kashi and Omker N. Koul (1997) *Kashmiri: A Cognitive-Descriptive Grammar*. London: Routledge.
- Watkins, Laurel J. and Parker MacKenzie (1984) *A grammar of Kiowa*. Lincoln, Nebr.: University of Nebraska Press.
- Watters, David E. (2002) *A Grammar of Kham*. Cambridge, UK: Cambridge University Press.
- Wechsler, Stephen (2010) What 'you' and 'I' mean to each other: Person indexicals, self-ascription, and theory of mind. *Language* **86**(2): 332–365.
- Weiers, Michael (2003) Moghol. In Janhunen (2003), 248–264.
- Weigand, Gustav (1888) *Die Sprache der Olympo-Walachen*. Leipzig: Johann Ambrosius Barth.
- Weinreich, Uriel (1984) *Modern English-Yiddish, Yiddish-English Dictionary*. New York: Random House.
- Weiss, Michael (2009) *Outline of the historical and comparative grammar of Latin*. Ann Arbor: Beech Stave Press.
- Werner, Heinrich (1997a) *Abriß der kottischen Grammatik*. Wiesbaden: Harrassowitz Verlag.

- Werner, Heinrich (1997b) *Das Jugische (Sym-Ketische)*. Wiesbaden: Harassowitz Verlag.
- Werner, Heinrich (1997c) *Die ketische Sprache*. Wiesbaden: Harassowitz Verlag.
- Wiese, Bernd (2004) Unterspezifizierte Stammparadigmen: Zur Systematik des Verablaufs im Gegenwartsdeutschen, unpublished ms. IDS Mannheim.
- Wiese, Bernd (2005) Form and function of verb ablaut in contemporary standard German. In *Studies in Integrational Linguistics*, Robin Sackmann, ed., Amsterdam: John Benjamins, To appear.
- Williams, Edwin (2003) *Representation Theory*. Cambridge: MIT Press.
- Williamson, Kay (1965) *A grammar of the Kolokuma dialect of Íjò*. Cambridge: Cambridge University Press.
- Wilson, P. M. (1970) *Simplified Swahili*. Nairobi: East African Literature Bureau.
- Windfuhr, Gernot, ed. (2009) *The Iranian Languages*. London: Routledge.
- Windfuhr, Gernot and John R. Perry (2009) Persian and Tajik. In Windfuhr (2009), 416–544.
- Winkler, Eberhard (2001) *Udmurt*. München: Lincom Europa.

- Winter, Yoad (2006) Closure and telicity across categories. In *Proceedings of Semantics and Linguistic Theory 16*, Christopher Tancredi, Makoto Kanazawa, Ikumi Imani, and Kiyomi Kusumoto, eds., Ithaca: Cornell Linguistics Club.
- Wold, Dag (1991) A few properties of *the ... the ...* comparative constructions. In *Proceedings of the Second Annual Formal Linguistic Society of Mid-America (FLSM2)*, 272–281.
- Woollams, Geoff (1996) *A grammar of Karo Batak, Sumatra*. Canberra: Department of Linguistics, the Australian National University.
- Wordick, F. J. F. (1982) *The Yindjibarndi language*. Canberra: Pacific Linguistics.
- Wright, Joseph (1910) *Grammar of the Gothic Language*. Oxford: Clarendon Press.
- Wurmbrand, Susi (2008) *WollP: Where syntax and semantics meet*. In *Proceedings of NELS 37*, Emily Elfner and Martin Walkow, eds., Amherst, Mass: Graduate Linguistic Student Association.
- Wurmbrand, Susi (2010) Parasitic morphology in Germanic: Consequences for the theory of syntactic licensing, ms. University of Connecticut [Detailed handout available at: <http://wurmbrand.uconn.edu/Susi/Agree.html>].

- Wurmbrand, Susi (2011a) On Agree and Merge, ms., University of Connecticut, Storrs. [Lecture notes available at: <http://wurmbrand.uconn.edu/Susi/Agree.html>].
- Wurmbrand, Susi (2011b) Parasitic participles in Germanic: Evidence for the theory of verb clusters., ms. University of Connecticut, Storrs.
- Wurmbrand, Susi (2011c) Tense and aspect in English infinitives., ms. University of Connecticut, Storrs. [Available at: <http://wurmbrand.uconn.edu/Susi/Infinitives.html>].
- Wurzel, Wolfgang (1985) Die Suppletion bei den Dimensionsadjektiven. *Studien zur Morphologie und Phonologie* **A126**: 114–143.
- Yoshida, Yutaka (2009) Sogdian. In Windfuhr (2009), 279–335.
- Young, Roberts W. and William Morgan (1987) *The Navajo Language: A Grammar and Colloquial Dictionary*. Albuquerque: University of New Mexico Press.
- Zaicz, Gábor (1998) Mordva. In Abondolo (1998b), 184–218.
- Zajkov, P. M. (1999) *Grammatika karel'skogo jazyka (fonetika i morfologija)*. Petrozavodsk: Periodika.
- Zajtseva, Maria Ivanovna (1981) *Grammatika vepsskogo jazyka (fonetika i morfologia)*. Leningrad: Nauka.

- Zakiev, Mirfatyx Zakievich (1966) Tatarskij jazyk. In Vinogradov et al. (1966b), 139–154.
- Zakiev, Mirfatyx Zakievich, Fuat Ashrafovich Ganiev, and Klara Zievna Zinatullina, eds. (1997) *Tatarskaja grammatika, tom II: Morfologija*. Kazan: Tatar Academy of Sciences.
- Zaliznyak, Andrey Anatolyevich (1977) *Grammatičeskij slovar' russkogo jazyka*. Moscow: Nauka.
- Zeitoun, Elizabeth (2007) *A Grammar of Mantauran (Rukai)*. Taipei: Academia Sinica.
- Zepeda, Ofelia (1983) *A Papago Grammar*. Tuscon, AZ, USA: The University of Arizona Press.
- Zhukova, Alevtina N. (1968a) Aljutorskij jazyk. In Vinogradov et al. (1968), 294–309.
- Zhukova, Alevtina N. (1968b) Korjaskij jazyk. In Vinogradov et al. (1968), 271–293.
- Zhukova, Alevtina N. (1972) *Grammatika korjaskogo jazyka: fonetika, morfologija*. Nauka.
- Zuñiga, Fernando (2006) *Mapudungun: El habla mapuche*. Santiago de Chile: Centro de estudios públicos.