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CROSS-LINGUISTIC VARIATION IN THE SEMANTICS OF COMPARATIVES

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ABSTRACT

Research on understudied languages and cross-linguistic variation from a formal semantic perspective is in its relative youth, but has been attracting the attention of more and more linguists over the past 15 years or so. This dissertation contributes to this line of work by investigating comparative constructions in Luganda and Washo. These languages make use of comparative constructions that are typologically common (Stassen 1985) but which have received little attention in formal linguistics. I provide a formal semantic analysis of these constructions, and situate the results within a broader picture of the nature of cross-linguistic variation in the meaning component of grammar.

In chapter 1 I outline various points of semantic variation that have been discussed in the literature so far, and propose that they all fall under one of two main categories: variation at the lexical semantic level; and variation at the syntax-semantics interface. In chapter 2 I review the current state of the art on research on comparative constructions in English and other languages, and introduce the distinctions between explicit and implicit comparison (Kennedy 2007) and clausal versus phrasal comparison (Heim 1985, among others), and diagnostics for these distinctions. I then introduce and analyze exceed and cleft comparisons in Luganda (chapter 3). I argue that while exceed comparisons make use of a semantic comparative morpheme similar to English -er/more, the comparison interpretation of clefts is derived pragmatically. I argue in chapter 4 that the variation observed between Luganda exceed comparatives and English -er comparatives is largely variation at the syntax-semantics interface. In chapter 5 I discuss the properties of conjoined and locative comparisons in Washo, and argue that neither makes use of a comparative morpheme similar to -er. I propose that this variation is due to lexical variation in the semantics of gradable predicates in Washo and English, and that this explains not only the lack of a comparative morpheme in Washo, but also the absence of the entire paradigm of degree constructions in this language (chapter 6). Chapter 7 concludes by taking stock of the cross-linguistic picture outlined at the beginning of the dissertation, and revising some of the proposals in this area in light of the results of chapters 3-6.

LIST OF GLOSSING CONVENTIONS

1	first person	LOC	locative
2	second person	NC	negative concord
3	third person	NC#	noun class number
AOR	aorist	NEG	negation
ATTR	attributive	NMLZ	nominalizer
AUG	augment	OBJ	object
AUX	auxilliary	PASS	passive
CLEFT	cleft	PL	plural
COP	copula	POSS	possessive
D.POSS	D-possessive	PST	past
DEIC	deictic	PROX	proximate demonstrative
DET	determiner	Q	question particle
DIST	distal demonstrative	REC.PST	recent past
DIST.PST	distant past	REFL	reflexive
DU	dual	REL	relative
FV	final vowel	SEQ	sequential
GEN	genitive	SG	singular
HUM.PL	human plural	SR	switch reference
IMP	imperative	STATIC	prefix on weather predicates
INCH	inchoative	SUBJ	subject
INS	instrumental	TAP	tense aspect particle
INT.PST	intermediate past	TOP	topic marker
IPFV	imperfective	UNEXP.OBJ	unexpressed object

Chapter 1

CROSS-LINGUISTIC VARIATION IN SEMANTICS: AN OVERVIEW

1.1 Introduction

1.1.1 Universals and variation in meaning

A central issue that linguists aim to investigate is the nature of the internal knowledge and abilities that allow humans to express the things they want to communicate. Semanticists are particularly concerned with aspects of communication that involve meaning. Specifically, how do linguistic forms map onto particular meanings?

Typological research has shown there is much variation in linguistic form (see e.g. The World Atlas of Linguistic Structures: Dryer & Haspelmath, 2011). At the same time, formal research has shown that such variation is nevertheless highly constrained. Typologists and formal linguists alike also aim to uncover universals that unify all human languages despite apparently wild variation. For example, Greenberg (1963) remains one of the most celebrated papers in linguistics, despite the fact that many of his 45 proposed universals have turned out to be false.[1]

While most of the typological literature has focused on variation and universals in syntax and phonology, relatively little research has been devoted to uncovering points of variation and possible universals from a formal semantic point of view. As von Fintel & Matthewson (2008) point out, this is in large part due to the fact that formal semantics is a relatively young field within linguistics, which has traditionally focused on well-studied languages like English and German, and which has only recently begun to embrace data from relatively understudied languages. Beginning in the 1990s, researchers started to recognize the importance of applying the tools of formal semantics to understudied languages. New data was brought into the view of formal semantics both by

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1. Greenberg indeed acknowledges that many of his proposed universals are statistical, rather than absolute, in nature, i.e., they are not exceptionless. See Dryer (1992) on testing Greenberg against a database of 625 languages.

linguists working on their native languages, as well as those working in fieldwork situations.[2] This dissertation contributes to the growing body of literature that is beginning to fill this gap.

Given that morphosyntactic forms are subject to cross-linguistic variation, it seems natural to ask whether the meanings derived from those forms can also vary. In this dissertation, I explore the question of to what extent we find variation in the semantic component by considering the interpretation of comparative constructions cross-linguistically. For instance, the truth conditions of the English comparative in (1) might plausibly be stated as in (2).[3]

(1) Joe is taller than Bill.

(2) the maximal degree to which Joe is tall is greater than the maximal degree to which Bill is tall.

The sentence in (1) is an instance of the comparative construction in English, and makes a graded claim about two individuals with respect to a certain property. The interpretation of (1) given in (2) states that the maximal degree to which Joe is tall is greater than the maximal degree to which Bill is tall. We therefore want to test whether constructions that are used to make comparisons in other languages also have interpretations along the lines in (2), and if so, how this interpretation is derived compositionally in those constructions.

I address this question by investigating the semantics of comparative constructions in two understudied and typologically diverse languages: Luganda (Bantu; Uganda), and Washo (isolate/Hokan; California and Nevada). The sentences given in (3) and (4) represent the canonical comparative constructions in Luganda and Washo, respectively. The Luganda constructions in

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2. An example of the former is the work of Anastasia Giannakidou on Greek (e.g. Giannakidou, 1997), while a pioneering example of the latter is found the work of Maria Bittner on Kalaallisut (e.g. Bittner, 1994). A volume of papers dedicated to cross-linguistic work on quantification (Bach et al., 1995) was also one of the early contributions to the development of this trend.

3. More specific proposals for the interpretation of comparative constructions is discussed in more detail in chapter 2.

(3a) and (3b) are classified as EXCEED comparisons, since they involve a verb meaning 'to exceed' (Stassen, 1985). The construction in (3c), meanwhile, is a CLEFT construction, which is not recognized by Stassen as a major type of comparative construction in the world's languages. Nevertheless, according to Ashton et al. (1954) such a construction can convey comparison. The Washo construction in (4a) is an example of CONJOINED comparison, whereby two clauses containing antonyms are juxtaposed (Stassen, 1985). Meanwhile, the construction in (4b) is a LOCATIVE comparison, since the standard of comparison is marked by a postposition that has a locative or spatial meaning.[4]

(3) a. *Kizito asinga   Kato obuwanvu.*
         Kizito a-singa   Kato o-bu-wanvu
         K   NC1-exceed K   AUG-NC14-tall
         'Kizito is taller than Kato.'

         (literally: 'Kizito exceeds Kato in height.')   LUGANDA

     b. *Kizito muwanvu okusinga   Kato.*
         Kizito mu-wanvu o-ku-singa   Kato
         K   NC1-tall   AUG-NC15-exceed K
         'Kizito is taller than Kato.'

         (literally: 'Kizito is tall to exceed Kato.')   LUGANDA

     c. *Kizito ye   mukulu.*
         Kizito a-e   mu-kulu
         K   NC1-CLEFT NC1-old
         'Kizito is older (than other people/things in a context).'

         (literally: 'Kizito is the one who is old.')   LUGANDA

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4. Throughout this document, Luganda examples are presented in the standard orthography, while Washo examples are presented in a modified IPA transcription, largely following Jacobsen (1964). Deviations from the normal IPA values in Washo examples are as follows: *š* = [ʃ], *y* = [j], *L* = [l̥], *M* = [m̥], and V́ represents a stressed vowel. In the underlying representation of morphemes (second tier), C represents gemination of the following consonant, N represents an underlyingly placeless nasal, and RED refers to reduplication. Tone is not marked in the Luganda examples. A complete list of morpheme glosses used in this document (third tier) is given in the List of Glossing Conventions in the front matter of this dissertation.

(4) a. *t'é:liwhu delkáykayiʔ*   *k'éʔi*   *šáwlamhu delkáyayiʔé:s*
t'eˈliwhu de-ʔil-kaykay-iʔ   k'-eʔ-i   šawlamhu de-ʔil-kaykay-iʔ-e:s
man   NMLZ-ATTR-tall-ATTR 3-COP-IPFV girl   NMLZ-ATTR-tall-ATTR-NEG
k'áʔaš
k'-eʔ-aʔ-š
3-COP-AOR-SR

'The man is taller than the girl.'

(literally: 'The man is tall, the girl is not tall.')   WASHO

b. *t'é:liwhu delkáykayiʔ*   *k'éʔi*   *šáwlamhu lélew*
t'e:liwhu de-ʔil-kaykay-iʔ   k'-eʔ-i   šawlamhu lelew
man   NMLZ-ATTR-tall-ATTR 3-COP-IPFV girl   beside
'The man is taller than the girl.'

(literally: 'The man is tall next to the girl.')   WASHO

Clearly, there is much variation in the morphosyntactic forms of the comparative sentences in English, Luganda and Washo. Notably, neither Luganda nor Washo appear to make use of an overt grammatical morpheme parallel to English *-er* that marks the gradable predicate in these comparative constructions. If the truth conditions in (2) are correct for the English comparative, we would like to know whether the same paraphrase can be ascribed to the Luganda and Washo comparatives as well, despite these morphosyntactic differences. In the course of such an investigation, we would want to identify which semantic pieces are essential to the comparative relation, which morphosyntactic pieces instantiate those semantic pieces, and how those pieces are combined to arrive at the propositional-level truth conditions.

The goals of this dissertation are not only to describe and analyze the interpretation of comparative constructions in Luganda and Washo, but also to develop methodological tools for investigating the semantic properties of understudied languages. In this chapter, I argue for an investigation of cross-linguistic variation that is informed by formal semantic theories, and review possible places where we might expect to find variation in the semantic component of grammar. I then outline my main empirical, analytical, and methodological claims that I argue for in this dissertation, and make some initial comments on the methodological approaches I adopt in the present

investigation. First, however, I clarify what I mean by semantic variation, and outline possible loci of variation in semantics.

1.1.2   Varieties of variation

I would first like to distinguish two different sorts of semantic variation that are often not overtly distinguished in the literature. One one hand, we may expect to find variation at the level of the core meaning of simplex linguistic expressions. I will refer to this as semantic, or **lexical variation**. I refer to lexical aspects of semantics as those whose content contributes to propositional-level truth conditions. On the other hand, we may also find points of variation in the mechanisms that build complex meanings out of those simplex parts. I will refer to this as **variation at the syntax-semantics interface**. Examples of this type of variation include argument structure and the semantic type of linguistic expressions, as well as the availability of compositional principles to derive complex meanings. Typically, work on semantic universals and variation focus on one of these aspects of meaning without explicitly making the distinction I have here.

For instance, the Strong Effability Thesis in (5) and the Translatability Thesis in (6) are proposed universals on lexical variation, following a tradition within linguistics that views meaning as an aspect of grammar that crucially does not vary across languages.[5] They both make claims about the meanings of propositions, without making reference to the ways in which those propositions are built in syntax.

(5)   **Strong Effability Hypothesis**

Every proposition is the sense of some [grammatical; MRB] sentence in each natural language.   (Katz, 1976, p. 37)

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5. I consider (5) and (6) to be lexical in nature in that they have to do with the *content* of propositions, rather than their morphosyntactic form or internal composition.

(6)   **Translatability Thesis**

For any pair of natural languages and for any sentence *S* in one and any sense σ of *S*, there is at least one sentence S' in the other language such that σ is a sense of S'.   (Katz, 1976, p. 39)

These hypotheses say something about universal expressivity at the propositional level. The strongest hypothesis is the Strong Effability Hypothesis in (5), which states that any proposition can be expressed in any natural language. Since there are potentially thorny philosophical issues with (5) (for instance, regarding propositions that can't be thought or grasped by humans), we will concentrate here on the slightly weaker Translatability Thesis in (6). Under this proposal, any propositional content that can be expressed in some human language can also be expressed in any other human language. Such a hypothesis is still quite strong, and can be falsified if it is possible to find a meaning that can be expressed in one language but not in another. As von Fintel & Matthewson (2008) point out, we must take (6) to apply only to sentence-level *truth conditional* meaning, since other types of meaning such as expressives, connotations, and certain implicatures and presuppositions often cannot be adequately translated between all languages. Setting aside this difficulty, for many linguists, (6) can be viewed as a natural extension of the theory of Universal Grammar (UG), namely that the grammatical properties of all human languages are constrained by a language faculty that is part of the genetic endowment of the human species. Since all human beings supposedly share UG, then it follows that all languages should be equally adequate in expressing propositional content.

Certain linguists have recently begun to levy challenges against the Translatability Thesis, and UG more generally, based on cross-linguistic evidence (see Evans & Levinson, 2009). A case in point is a recent paper by Everett (2005) based on his fieldwork with the Pirahã tribe of the Amazon. Everett claims that the Pirahã language lacks certain features that are claimed to hold across all languages. For example, Everett argues that Pirahã lacks quantificational elements parallel to English *most* as in *most of the fish*. Rather, this language uses an expression *'ogi-ó*, translated into

English as a nominal 'a bigness of' as shown in (7):

(7) *ti 'ogi -'aaga   -ó   'ítii'isi **'ogi -ó**   'i kohoai-baaí, koga*
     I big -be (permanence) -direction fish   **big -direction** she eat-intensive nevertheless
     hói   hi   hi   -i kohoi -hiaba
     small amount intensive intensive -be eat   -not
     'We ate most of the fish.' (lit. 'My bigness ate [at] a bigness of fish, nevertheless there was

     a smallness we did not eat.')   (Everett, 2005, p. 624)

Everett concludes that a hypothesis such as the Translatability Thesis "must be abandoned" (p. 643) since Pirahã supposedly lacks certain expressive power that is available in other languages.

The Translatability Thesis, however, is not a claim about how meanings can be packaged up in a particular language. The fact that Pirahã does not have a word of the same category as English *most* to express a quantificational meaning does not falsify the Translatability Thesis, so long as the different strategies employed by English and Pirahã yield the same propositional meaning. For instance, Nevins et al. (2009) show that Russian also lacks a quantifier parallel to English *most*, but instead also uses a nominal construction to express this meaning (also compare English *the majority of*, which arguably has parallel truth conditions to *most*). If the Translatability Thesis is a semantic universal, then we do not expect to find cross-linguistic variation in terms of what kinds of meanings can be expressed. That is, the Translatability Thesis is a hypothesis about universality at the lexical level, and not at the level of the syntax-semantics interface. It has nothing to say about the ways that languages package and combine sub-sentential meanings to arrive at sentence-level truth conditions. While Everett has indeed shown that English and Pirahã vary with respect to their morphosyntax, he has not conclusively shown that these differences actually amount to the kind of *semantic* variation that would falsify the Translatability Thesis.

Another celebrated example of a possible semantic universal comes to us from Barwise & Cooper (1981). These authors propose several "semantic" universals about the nature of quantification in natural language, two of which are listed here.

(8) NP-Quantifier Universal:

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Every natural language has syntactic constituents (called noun-phrases) whose semantic function is to express generalized quantifiers over the domain of discourse.

<div align="right">(Barwise & Cooper, 1981, p. 177)</div>

(9) Determiner Universal:

Every natural language contains basic expressions (called determiners) whose semantic function is to assign to common count noun denotations (i.e., sets) *A* a quantifier that lives on *A*. (Barwise & Cooper, 1981, p. 179)

The proposed universals in (8) and (9) are fundamentally different from those in (5) and (6). Barwise & Cooper's universals crucially relate to the syntax-semantics interface, specifically the morphosyntactic pieces that are implicated in building generalized quantifiers. These particular proposals for universals have been subject to scrutiny in the formal semantics literature, and have subsequently been shown to be false (see Bach et al., 1995). However, as we will see in the following section, it is less clear that there is variation in quantificational expressions in what I have termed the lexical component.

While I maintain that it is crucial to recognize these as two separate aspects of semantic variation, they are two sides of the same coin. Both types of variation affect the interpretational component of grammar, i.e., the way that sentence meaning is derived.

1.2   Variation in at the syntax-semantics interface: two hypotheses

Despite the shortcomings and arguments against the Translatability Thesis given in the previous section, even if we accept it as a plausible semantic (lexical) universal, we nevertheless observe that there is much cross-linguistic variation in how meaning-bearing units are combined. Since languages differ in their morphosyntax, we might expect that such variation tracks certain semantic distinctions. In this section, I introduce and contrast two hypotheses for dealing with variation

at the syntax-semantics interface that have received recent attention in the literature. These hypotheses are outlined in (10) and (11), paraphrasing from Matthewson (2001):

(10) **No Variation Hypothesis:**

There is no cross-linguistic variation in semantics [the syntax-semantics interface; MRB], despite variation in surface syntax.

(11) **Transparent-Mapping Hypothesis:**

Semantics transparently reflects surface syntax.

Matthewson argues in favor of the No-Variation Hypothesis, since it is the strongest possible null hypothesis regarding cross-linguistic variation in semantics. Under such a hypothesis, she claims, there are "certain fundamental semantic structures or properties which all languages should share; which exactly these are is of course the interesting question" (Matthewson, 2001, p.156).

Thinking about the empirical domain of this dissertation, there are reasons to believe that comparatives might be one of those "fundamental semantic structures" that all languages should share. Sapir (1944, p. 93) writes that "grading as a psychological process ... precedes measurement and counting." This means that even speakers of languages that lack measure phrases or numerals should still be able to make graded judgments about objects. One such language is Pirahã, which has been described as having a "one, two, many" number system (Gordon, 2004), or as lacking any terms that refer to exact quantity at all (Everett, 2005). Experimental studies have nevertheless shown that despite this lexical gap, Pirahã speakers are still able to both discriminate between small exact quantities and also approximate larger quantities (Frank et al., 2008). These results correspond with the two core systems for number cognition that have been proposed for humans and other species - parallel individuation and analog magnitude (Feigenson et al., 2004) - which indicates that the use of these systems precede their linguistic encoding. These findings accord with Sapir's contention that gradability is a cognitively basic process, and suggest that comparison is a plausible candidate for a universal semantic structure.

Matthewson's discussion of the No-Variation Hypothesis arises in the context of an analysis of quantificational structures in St'át'imcets, where an observed point of variation between English and St'át'imcets appears to be the type of the first argument of a quantificational element: in English an NP of type $\langle e,t \rangle$; in St'át'imcets a DP of type e. This difference corresponds to a surface syntactic difference between the two languages: the NP naming the restriction of the quantifier in St'át'imcets combines with an overt determiner before combining with the Q head, whereas the standard analysis for English does not assume such a structure. The differences between English and St'át'imcets are sketched in the trees in (12)-(13):

(12)   English:

QP : $\langle \langle e,t \rangle, t \rangle$

Q : $\langle \langle e,t \rangle, \langle \langle e,t \rangle, t \rangle \rangle$ NP : $\langle e,t \rangle$

every   *woman*

(13)   St'át'imcets:

QP : $\langle \langle e,t \rangle, t \rangle$

Q : $\langle e, \langle \langle e,t \rangle, t \rangle \rangle$ DP : $\langle e \rangle$

tákem   D : $\langle \langle e,t \rangle, e \rangle$ NP : $\langle e,t \rangle$

'all'

i … a   *smelhmúlhats*

DET   'women'
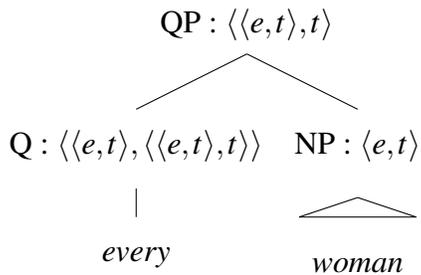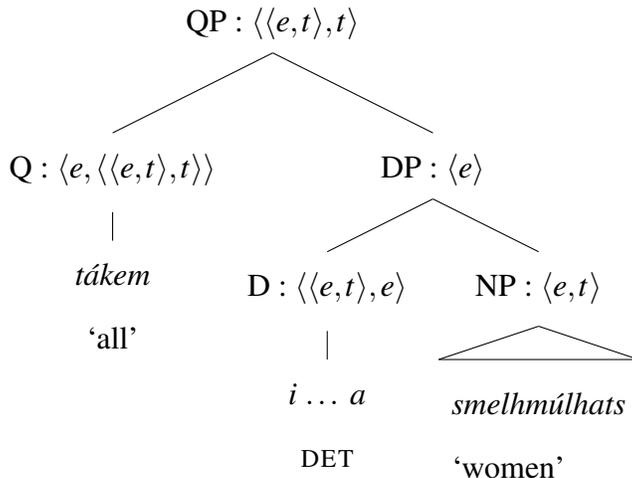
Matthewson pursues an alternative analysis of English quantificational structures under which a quantifier's first argument is also of type e, eliminating the apparent variation observed between the two languages. Her final proposal, in line with the No-Variation Hypothesis, is that quantificational elements cross-linguistically are of type $\langle e, \langle \langle e,t \rangle, t \rangle \rangle$, with no variation observed between

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the semantic type of quantifiers across languages. She argues that the creation of generalized quantifiers in both languages involve a two-step process. First, a determiner combines with an NP of type $\langle e,t\rangle$ to create a plural individual (type e). Then, a quantifier combines with the DP, resulting in a generalized quantifier meaning (= semantic type) $\langle\langle e,t\rangle,t\rangle$. That is, both English and St'át'imcets have generalized quantifiers of the same semantic type, but there is overt evidence from St'át'imcets of an intermediate step between the NP denotation and the generalized quantifier denotation, which Matthewson seeks to generalize to English in view of the No-Variation Hypothesis. In this example, no variation in semantics is interpreted as no variation in semantic types. This view assumes a model where specific syntactic pieces are associated with certain pieces of meaning (or certain semantic types), meaning that 'no variation' is taken to be at the level of the syntax-semantics interface.

It is well known, however, that the creation English generalized quantifiers also involves a two-step process. Specifically, the set denoted by the NP must be subject to domain restriction, and it is then this restricted set that is the first argument of the quantifier (von Fintel, 1994). The point of cross-linguistic variation between English and St'át'imcets then is the nature of the intermediate step between the NP denotation and the creation of the generalized quantifier, the reflexes of which result in different semantic types for the first argument of the quantifier. In English, a null domain restriction operation narrows down the set denoted by the NP, the result of which is a set-denoting NP, while in St'át'imcets domain restriction is achieved by an overt determiner that creates a plural individual. In both cases, the final result is a generalized quantifier of type $\langle\langle e,t\rangle,t\rangle$.

While the overt morphosyntax of generalized quantifiers is different in English and St'át'imcets, we can generalize the basic elements of quantificational structures cross-linguistically as in (14):

(14)   Basic elements of quantificational structures:

    a.   a GENERATOR SET of individuals *A*

    b.   DOMAIN RESTRICTION over *A*

    c.   an expression that creates a GENERALIZED QUANTIFIER of type $\langle\langle e,t\rangle,t\rangle$ on the re-

stricted denotation of *A*

While these three ingredients do not appear to be subject to variation in these languages, the cross-linguistic data indicate that the type of domain restriction at work may vary across languages: overt determiners in St'át'imcets; or covert operators in English. In fact, we find even more variation with respect to the syntactic instantiation of these elements across languages. Giannakidou (2004) argues, on the basis of data from Greek, that domain restriction can also live on the Q head itself. She shows that in Greek, certain quantificational elements co-occur with overt determiners, as in (15):

(15) Greek:

```
                        QP
                       /  \
                     /      \
                   Q          NP
                  / \         /‾‾\
                 /   \       fititis
                D     Q
                |     |     'student'
                o   kathe
              'the'  'every'
```
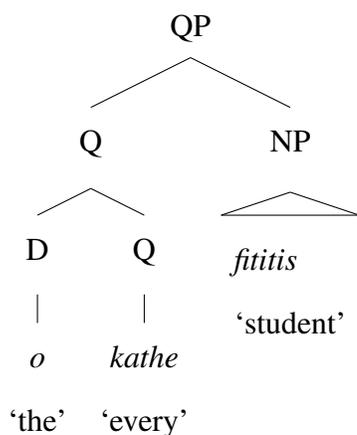
Giannakidou nevertheless argues that QP in Greek has the same generalized quantifier meaning (semantic type) as those in English and St'át'imcets. Thus, there is apparently no variation between these languages with respect to the elements in (14). However, in view of the Greek facts, it seems harder to generalize a universal syntax-semantics mapping for generalized quantifier creation cross-linguistically. What this seems to indicate, together with the observation that the NP-Quantifier Universal is false, is that the No-Variation Hypothesis is not correct. Of course, this essentially amounts to a syntactic difference, and not variation at the lexical level.

How much do we lose by weakening the No-Variation Hypothesis to allow for different syntactic structures and semantic types for quantificational structures across languages? Such a revised

hypothesis would be a version of the Transparent-Mapping Hypothesis, in that the semantics directly reflects surface syntactic structures. That is, insofar as there is surface syntactic variation, there is also variation in the composition of the semantic pieces that make up a complex expression. The difference in semantic type between English and St'át'imcets quantifiers is then derived from the fact that in St'át'imcets the syntactic category D is projected within quantificational structures, while in English it is not. Meanwhile, the difference between St'át'imcets and Greek lies in the location of the overt domain restriction within the syntactic structure. So long as we have a restrictive theory of variation in possible syntactic structures cross-linguistically, then it follows that variation at the level of the syntax-semantics interface should also be highly constrained in a principled way.

Matthewson (2001) argues, however, that the appeal of taking No-Variation as the null hypothesis is not simply in whether or not it turns out to be correct. Rather, the main advantage of the No-Variation Hypothesis is that it is the strongest possible hypothesis regarding the nature of cross-linguistic variation. In this respect, No-Variation is contrasted with the Transparent-Mapping Hypothesis, which does not assume any expectation of universality at any level. The methodology of taking Transparent-Mapping as the null hypothesis is advocated by Evans & Levinson (2009), who oppose universalist analyses of variation, and argue that "structural differences should instead be accepted for what they are" (p. 429). As demonstrated in this brief case-study on quantificational expressions, it seems that some version of Transparent-Mapping is likely to turn out to be correct, even if we take No Variation as the starting point of the investigation.

A worry of Evans & Levinson regarding the No-Variation Hypothesis is that it wrongfully assumes that all languages are English-like in their structure.[6] However, taking No-Variation as the null hypothesis does not entail that the final hypothesis reached will also be one of no variation. In fact, I will argue in this dissertation that the No-Variation Hypothesis cannot be upheld in view of

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6. Their concern is actually directed at UG more generally, and they deny that there can be any meaningful universals in any domain of grammar: syntax, semantics, or phonology.

the data that will be explored. While taking No-Variation as the null hypothesis assumes no variation, the advantage of No-Variation is in its strength: by directly testing this hypothesis, we will discover variation if it exists. By contrast, by taking Transparent-Mapping as the null hypothesis, the linguist denies any expectation of finding similarities between languages. The result is that the researcher may be predisposed to over-exoticize the language data, which can lead to spurious generalizations.[7]

Furthermore, the researcher assuming Transparent-Mapping is more likely to miss underlying similarities between languages, despite apparent surface variation. For example, the researcher who takes a purely surfacist version of Transparent-Mapping as the null hypothesis and discovers that quantificational structures in Greek and St'át'imcets project determiners, whereas those in English do not, may be tempted to come to the erroneous conclusion that these structures also have semantic differences in the three languages, which is reflected in their different syntax. However, it is not the case that there is no domain restriction in quantification structures in English because there is no overt determiner like in Greek or St'át'imcets. Rather, domain restriction in English happens to be covert (von Fintel, 1994; Stanley, 2000). Discovering such similarities may therefore require some level of analytical abstraction, but doing so is not tantamount to forcing an English-like analysis on other languages. By contrast, positing a null domain restriction in English makes it look more like Greek or St'át'imcets than what we otherwise would have hypothesized, given the overt syntactic differences between these languages. Thus, we must allow a certain level of abstraction in the analysis, even if we begin with Transparent-Mapping as the null hypothesis.

I submit that the best way to uncover semantic variation is to begin with a falsifiable hypothesis that is informed by formal research, which is then systematically tested in the language under investigation. If we begin with No-Variation, this means that by testing the strong hypothesis that there is no variation across languages in the semantic component of grammar, we will find such variation if it exists, and revise our hypothesis accordingly. Meanwhile, if we begin with

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7. See, for instance, several of the contributions to the commentary section of Evans & Levinson (2009).

Transparent-Mapping, we must also rigorously test such a hypothesis in order to uncover the possibility of non-variation lurking underneath the surface. That is, I do not advocate an extreme version of Transparent Mapping along the lines of Evans & Levinson (2009), who explicitly do not support positing any abstraction in the analysis of linguistic data. However, if we take as the starting point a version of Transparent-Mapping that acknowledges compositionality as the driving force behind deriving complex meanings and that allows for some amount of underlying abstraction in the analysis of linguistic structures (along the lines of Partee, 1995), then we can reasonably expect that a good linguist starting with these assumptions will discover (non-)variation between languages, even where such a conclusion may be surprising based on surface syntactic variation.

Whereas Matthewson (2001) couches the discussion of No-Variation and Transparent Mapping within an investigation into variation at the syntax-semantics interface, I argue that the methodology of an approach guided by formal theories should be taken for investigating universals and variation at the lexical level as well. By testing this strong null hypothesis for lexical variation as well, we will discover such variation if it exists. And in fact, such variation will be discovered in this dissertation, specifically in the lexical semantics of gradable predicates across languages.

In sum, I maintain that the right way of going about investigating cross-linguistic semantics is to begin with a strong null hypothesis that is explicitly tested on the basis of formal semantic research. In this respect, I echo the methodological views advocated by Matthewson (2013). That is, such research must begin with a strong null hypothesis, either No Variation or the restricted version of Transparent Mapping described above, which is explicitly tested based on formal theories of the phenomena being investigated. It is only through this form of investigation that formally-informed semantic typologies can begin to be developed.

1.3   Possible loci of lexical variation

As we have already seen, the Translatability Thesis is a hypothesis about universal translatability of propositions from one language to another, and I characterized this as a hypothesis about what I

have termed lexical variation. But of course, propositions are not the only pieces of language that have meanings associated with them. Words and morphemes contribute their own meaning, and the ways in which they are combined have an effect on the meaning of the proposition as a whole. Therefore, in our investigation of cross-linguistic variation and universals, we will not restrict ourselves to considering only sentence-level truth conditions, but also in other meaningful units that can have an effect on how more complex meanings are built. I now review some possible areas where we may expect to find lexical semantic variation. This list is not meant to be necessarily exhaustive, but it does cover major areas where variation may exist, and which will be at issue in this dissertation. As we will see, many of these points of lexical variation also affect the syntax-semantics interface.

1.3.1 Lexicalization of open-class items

First, we may expect to find variation in the ways in which languages package up semantic content at the word or morpheme level. There are of course several ways in which we might construe what counts as lexical variation in such elements. One type of lexical variation that will not be of particular interest to us here is how a particular semantic space is partitioned into individual lexical items that make up a semantic class. To take an infamous example, speakers of "Eskimo" reportedly have several different words referring to what English speakers would simply refer to as *snow* (see Pullum, 1989, for critical discussion of the "Great Eskimo Vocabulary Hoax"). That languages may divide a semantic field in arbitrary ways is well-known. The example in Table 1 comes from Hjelmslev (1943), cited by von Fintel & Matthewson (2008). Lexical variation of this sort will not be considered further in this dissertation.

Another way in which apparently translationally equivalent words or morphemes may differ across languages is in their presuppositions or connotations. For instance, Matthewson (2006a) argues that the translation equivalents of elements like *again* and *stop* in St'át'imcets do not carry the same presuppositions as their English counterparts. Meanwhile, Tonhauser et al. (to appear)

English	German	Danish	French
tree	Baum	træ	arbre
wood	Holz		bois
woods	Wald	skov	
forest			forêt

Table 1.1: The tree/wood/woods semantic field (von Fintel & Matthewson, 2008, p.149)

show that there is relatively little variation to be found in the general inventory and properties of several classes of presuppositions and other projective meanings between English and Paraguayan Guaraní.

Additionally, lexical items may differ in the sorts of semantic objects they denote. For instance, Chierchia (1998) argues that there is cross-linguistic variation in whether nouns are predicate-denoting or kind-denoting mass entities. He claims that the cross-linguistic differences along this dimension have reflexes on the grammar of determiner and classifier systems. For instance, nouns denoting predicates must combine with a determiner to appear in argument position, while kind-denoting nouns can appear in argument position without the presence of a determiner. However, kind-denoting nouns are the wrong type to combine directly with numerals, and a classifier must intervene to introduce atomicity. He proposes that French is a language where nouns denote predicates, Mandarin is a language where nouns always denote kinds, and English is a mixed type. Under this type of analysis, lexical semantic variation feeds variation at the syntax-semantics interface. Languages like Mandarin require the presence of classifiers in the syntax because the lexical semantics of nouns does not allow them to serve as the argument of numerals on their own.

Languages may also vary in what individual semantic pieces are lexicalized in a single word or morpheme. A recent proposal for a semantic universal in this domain comes from Rappaport Hovav & Levin (2010), who argue that the notions of 'manner' and 'result' cannot be lexicalized simultaneously in a single verb root. For instance, *sweep* is a manner verb that specifies a manner of cleaning, but does not entail that a result state (being clean) is reached as the result of a sweeping event. Meanwhile, *clean* is a result verb, but does not specify a specific manner by which the result

state is achieved. Rappaport Hovav & Levin propose that this constraint is a semantic universal, though see Beavers & Koontz-Garboden (2012) for challenges to this view.

These types of lexical variation can all be subsumed under what I will term **amount of lex-icalization**. That is, the translation equivalents of a word across languages may differ along the exact content they realize. We could, for instance, re-cast Chierchia's analysis of nominal reference in these terms. Nouns in French can directly serve as the argument of numerals because they have atomicity hard-wired into their lexical meanings. Nouns in Mandarin, however, do not have atomicity encoded in their lexical semantics, and therefore must combine with a classifier in order to combine with numerals. In other words, nouns in French denote the equivalent of noun + classifier combinations in Mandarin. Nouns in these two languages therefore differ in amount of lexicalization, specifically whether they directly lexicalize atomicity or not.

1.3.2 *"Semantic glue"*

Von Fintel & Matthewson (2008) use the term "semantic glue" to refer to the components of semantic interpretation that involve building more complex meanings by combining lexical items. Included under this rubric are functional elements and principles of composition.

Cross-linguistic research has already shown that there is much variation in the inventory of functional elements. For instance, in the domain of temporal reference, there has been much research on so-called "tenseless" languages, which appear to lack tense morphemes of the kind found in English (see e.g. Smith & Erbaugh (2005) and Lin (2006) for Mandarin Chinese; Bittner (2005) for Kalaallisut; Matthewson (2006b) for St'át'imcets; Tonhauser (2011) for Paraguayan Guaraní). Meanwhile, there are also several languages that appear to have *more* tense morphemes than English, which are used to make more fine-grained distinctions with respect to how far in the past an event has taken place (e.g. Hayashi (2011) for Inuktitut; Cable (2013) for Gĩkũyũ). These differences in the inventory of tenses are related to the notion of amount of lexicalization described above. Whereas the past tense in English simply relates the utterance time to some past reference

time, past tenses in languages like Inuktitut and Gĩkũyũ additionally lexicalize a temporal distance relation.[8] Meanwhile, tenseless languages apparently do not have any elements that lexicalize the relation between utterance time and reference time.[9] What this line of research has shown, however, is that lacking such categories does not inhibit the expressive power of speakers of such languages. For instance, Smith & Erbaugh (2005), Lin (2006) and Tonhauser (2011) argue that lexical aspect and contextual factors play a crucial role in tenseless languages in anchoring events in time, but not that speakers of such languages have difficulty with anchoring events in time.

Grammaticalized evidentiality is another functional category that many languages make use of, but which is completely absent in English (see Aikhenvald, 2004, for a typological review). But while English has no grammaticalized evidentials, speakers may still talk about sources of evidence through the use of adjuncts like *according to what I read in the newspaper*. I submit that variation of this sort may be characterized as **location of lexicalization**. Whereas some languages lexicalize source of evidence in functional categories, English does not. English exclusively lexicalizes source of evidence in lexical categories such as adverbs, and makes use of compositionality to integrate this content into the proposition. Likewise, tenseless languages have other means for identifying reference times, they just happen not to lexicalize this type of meaning in grammaticalized tense morphemes. Going back again to Chierchia's work on nominal reference, French is a language that lexicalizes atomicity directly in nouns, whereas in Mandarin this aspect of meaning is located in functional morphemes, namely classifiers.

With respect to composition principles, a standard view is that the set of such operations is vanishingly small, and universally available, with Function Application taken to be the most basic composition rule (Heim & Kratzer, 1998). Cross-linguistic research has also come to bear on this question, for instance in the work of Chung & Ladusaw (2004). They argue for an additional

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8. See Cable (2013) for arguments that these elements are technically not tenses, but rather morphemes that relate event time and utterance time.

9. Matthewson (2006b) proposes that St'át'imcets does in fact have such an element, but claims that it is phonologically null.

composition rule called Restrict in order to account for the interpretation of noun incorporation structures in Chamorro, but also claim that the availability of such a composition principle should be universally available. The use of Function Application versus Restrict represents a point of variation at the syntax-semantics interface as I conceive of it here, although the choice between them is also lexical in the sense that it is conditioned by the presence of particular lexical items. This line of research into variation in compositional mechanisms has so far received much less attention than cross-linguistic variation in functional elements, and I will not have more to say about this here (though see chapter 4 for some discussion on LF scope-taking mechanisms). See von Fintel & Matthewson (2008) for a more detailed overview.

1.3.3 Inventory of semantic types

As we have already seen, there is variation in the sorts of semantic objects that languages make use of in lexicalizing "simple" meanings (i.e., at the word level), and for building complex meanings. Chierchia parameter of variation in noun meanings was such an example, namely whether they denote properties of type $\langle e,t \rangle$ or kinds, a sort of individual type e. This distinction within type theory is intended to reflect the different semantic properties of predicates and kinds, and as such tracks a lexical distinction between nouns across languages. Meanwhile, as we saw in the discussion of quantifiers in the previous section, there was debate as to whether there exists variation in the semantic type of quantificational determiners: $\langle \langle e,t \rangle, \langle \langle e,t \rangle, t \rangle \rangle$ or $\langle e, \langle \langle e,t \rangle, t \rangle \rangle$. The difference in types in this case does not reflect a semantic difference in the lexical semantics of quantificational determiners per se: as we have seen, there does not seem to be any difference between generalized quantifiers in English, Greek and St'át'imcets in terms of what we have been calling lexical variation. Rather, the difference in types has to do with the syntactic status of the first argument of the quantifier: and NP of type $\langle e,t \rangle$ or a DP of type e. Thus, variation in the more complex types of functional morphology seems to be an issue related more to the syntax-semantics interface than to lexical semantics. To be sure, the line between variation in lexical meaning and

the syntax-semantics interface gets a bit blurry at this point. On one hand, there is a sense in which such variation in higher-order types is syntactic, given that their function is one of relating different syntactic constituents to one another. On the other hand, the nature of these higher order types is also lexical in nature, in the sense that quantificational elements lexicalize a functional relation different from other functional elements such as classifiers.

A somewhat different question related to semantic types is whether primitive types could be subject to variation. To my knowledge, this question has not received much attention in the literature. Heim & Kratzer (1998, pp 28-9) note: "Which semantic types are actually used by natural languages is still a matter of debate", although they do not extrapolate on such a debate. This is also not a question pursued by von Fintel & Matthewson (2008) in their review of proposed semantic universals. Given a model-theoretic semantics, we may ask what our default assumption about variation in this domain should be. Intuitively, it seems uncontroversial that reference to individuals and truth values ought to be universal. But what of event, world, time, and degree variables? Are these also universally available? The existence of degree variables (in any language) has been the subject of a particularly heated debate in the literature over the past few decades. While I go over this debate in more detail in chapter 2, the main issue is whether the added complexity of making reference to abstract objects, which most authors treat as the basic type of degrees, is necessary for the adequate description and explanation of natural language phenomena. Based on data from Washo, I will argue both in favor of the existence of degree variables in natural language, but also that whether a language makes use of them or not is subject to variation. I therefore advance the hypothesis that at least some basic types may not be universal across all languages. This essentially amounts to variation in amount of lexicalization, which addresses the question of whether there is reference to degrees in the lexical semantics of gradable predicates or not.

1.3.4 Taking stock

In these last two sections, I have made certain key distinctions about the sorts of variation we find in the semantic component of grammar. A summary of the proposed categories of semantic variation is given in (16). These categories may not turn out to be exhaustive, although I submit that all the points of variation that will be at issue in this dissertation will fall under (at least) one of the categories.

(16)   Varieties of semantic variation:

Is there variation?

NO   YES

Variation at what level?

SYNTAX-SEMANTICS   LEXICAL

INTERFACE   (SEMANTIC CONTENT)

Type of lexical variation

ARGUMENT   COMPOSITION

STRUCTURE   PRINCIPLES

AMOUNT OF   LOCATION OF

LEXICALIZATION   LEXICALIZATION
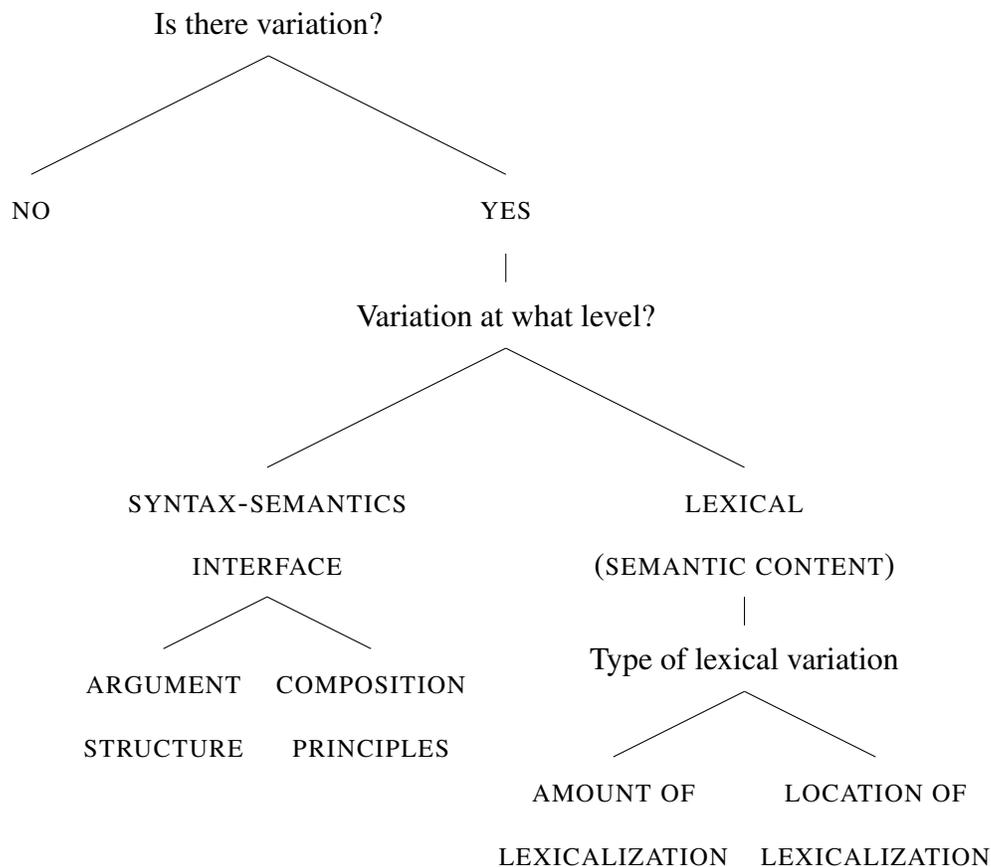
While I have characterized these sources of variation as completely separate from one another, what I argue in this dissertation is that these factors are in fact interdependent. For instance, the lexicalization of words and morphemes depends in part on the set of primitive types made available in the first place. Likewise, the (un)availability of certain semantic types may have an effect on the

sorts of functional elements that a language makes use of. For instance, as we have already seen, Chierchia's analysis of nominals cross-linguistically is an example of how these parameters are connected with one another. The proposal is stated in terms of lexical variation in nouns, but this lexical variation in turn governs the sorts of functional morphology found in the nominal domain. Thus, the use of particular functional morphology tracks a distinction in the sort of things that the relevant linguistic items denote. Likewise, while I have argued that the use of classifiers represents variation at the lexical level, specifically the location of lexicalization (is atomicity found in nouns, or in functional elements?) this sort of variation also has implications for the syntax-semantics interface, since variation in the lexicalization of atomicity has an effect on the syntax of numeral-noun combinations. That variation at the lexical and syntactic levels are interdependent is also the conclusion reached by Giannakidou (1997) in her study of polarity items cross-linguistically. I maintain, however, that these categories are useful for partitioning out the different ways in which cross-linguistic variation manifests itself in the meaning component of grammar.

1.4 Main claims

Now that I have introduced my assumptions about the nature of cross-linguistic variation in semantics, I now turn to an overview of the scope and results of this dissertation. My main claims can be categorized into three main types: empirical; analytical; and methodological.[10] I discuss each of these in turn here.

1.4.1 Empirical claims

This dissertation presents the first detailed description of the semantic properties of the types of exceed comparisons found in Luganda, and conjoined comparisons of the sort found in Washo. I also describe and analyze cleft comparisons and locative comparisons in Luganda and Washo,

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10. I credit Matthewson (2013) as the inspiration for dividing the main claims into these three categories.

respectively. I look at these constructions with an eye towards the types of semantic variation described in this chapter. One major claim that results from this investigation is that morphosyntactic variation in comparative constructions does not necessarily entail lexical semantic variation. In particular, as will be shown in chapters 3-4, Luganda exceed comparisons share many of the semantic properties of English *-er/more* comparatives, despite the fact that the comparative relation is expressed as a verb in Luganda, but as an affix (or adverb) in English.

Nevertheless, I also show that there are truth conditional differences between certain types of comparison constructions cross-lingusitically. Specifically, I show in chapter 5 that conjoined comparisons in Washo behave quite differently from English *-er/more* comparisons and Luganda exceed comparisons. I argue that in fact there is no evidence for the presence of any comparative morpheme in Washo, and that conjoined comparisons in this language display the semantic behavior of the positive form of gradable predicates, rather than the comparative form. I furthermore show in chapter 6 that Washo lacks the entire range of functional degree morphology that is present in English, including measure phrases, superlatives and equatives, and degree adverbs. Thus, there is variation not only in the members of the paradigm of degree constructions across languages, but also in whether such a paradigm even exists in every language.

1.4.2   Analytical claims

I argue that Luganda exceed comparatives are uniformly phrasal comparatives, as opposed to clausal. I review this distinction in chapter 2. The phrasal versus clausal distinction has already been discussed at length in the literature as a major point of variation in comparative constructions both across and within languages. This aspect of variation lies at the syntax-semantics interface. Whereas I argue that the core meaning of gradable predicates and comparative constructions is essentially the same in English and Luganda, these languages differ in the syntax-semantics mapping. Standards of comparison in Luganda are strictly phrasal, which is reflected in the semantic type of the comparative morphemes available in this language.

As for Washo, given the empirical picture that this language lacks the entire paradigm of functional degree morphology, I argue that this point of variation can be traced to lexical variation in gradable predicates across languages. Specifically, I argue that gradable predicates in Washo do not introduce a degree argument, and that this accounts for the semantic behavior of conjoined comparisons, and also the fact that Washo lacks functional degree morphology. Thus, whether a language makes use of degrees in the grammar of gradability is subject to variation, and has consequences for the availability of comparative morphology and other degree constructions in a language. This represents a point of lexical variation that has consequences for the syntax-semantics interface as well.

1.4.3   Methodological claims

Finally, I argue that in-depth study of particular semantic domains in individual languages is the right way to conduct research into semantic variation and universals. Rather than survey several languages at a more superficial depth, I focus our attention here on two languages (three, including English) and give a more in-depth analysis for each. This methodological practice is in the spirit, though ultimately somewhat different from the one advocated by Baker & McCloskey (2007). They argue for a "Middle Ground" in developing formal theoretically-driven syntactic typologies, whereby a phenomenon is examined in a medium number of languages (about a dozen or so) to a medium depth. An example of this "Middle Ground" typological work in semantics would be the work of Beck et al. (2009), who study comparative constructions in 14 languages by means of a general survey that is intended to capture certain basic properties of the languages they study. I maintain, however, that investigating fewer languages at a time at a greater depth allows us to get a better handle on the correct semantic analysis for a particular language, which in turn yields more accurate descriptive results. Furthermore, it is only after we have conducted such a rigorous semantic study that we may begin to make well-informed semantic typologies of construction types in the world's languages. Whereas information found in reference grammars can serve as

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important clues about the semantic properties of certain expressions in a language, in most cases the grammar writers did not have in mind, and therefore do not report on, the kinds of distinctions that formal semanticists look for in order to build semantic theories. As already pointed out, this is not surprising given the relative youth of formal semantics within linguistics. But this in turn means that it is all the more important that semantic analyses of understudied languages be based on thorough, targeted investigation, rather than surveys of a large or even medium number of languages, which are inherently more superficial in scope.

As I have already indicated, I believe that the right way to undertake such a cross-linguistic variation is to begin with a strong falsifiable null hypothesis that is explicitly tested based on the results of formal research in the particular domain being investigated. The starting null hypothesis must be one of no variation, following Matthewson (2001, 2013) and von Fintel & Matthewson (2008), or a version of Transparent-Mapping where we are willing to entertain a certain level of abstraction in linguistic analysis. Following the scientific method, the null hypothesis will be adjusted depending on the results of the investigation. We will not be satisfied in claiming that there is semantic variation purely on the basis of surface syntactic differences.

While the empirical and analytical claims make up most of the remainder of the dissertation, I take the time in the next section to focus on more specific aspects of the methodologies used in this dissertation for data collection and analysis.

1.5 Methodology

1.5.1 *The typology of comparative constructions in the world's languages*

Why study Luganda and Washo in order to answer these questions about variation in semantics, in particular the semantics of comparative constructions? As it turns out, the strategies used by these languages to make comparisons are typologically quite common among the world's languages. In a typology of comparative constructions in 110 languages, Stassen (1985) identifies exceed com-

parison, conjoined comparison, and locative comparison as three of the four major strategies for expressing comparison crosslinguistically. In his sample, 26 languages (24%) use exceed comparison; 26 languages (24%) use conjoined comparison; and 68 languages (62%) use locative comparison, in the sense defined here.[11]

Despite the typological frequency of these types of comparative constructions in the world's languages, there are vanishingly few studies dedicated to the detailed description or analysis of these structures. For instance, in the case of exceed comparisons, I am aware of only the following studies: Beerman et al. (2005) provide a very brief sketch of one sub-type of exceed comparison in Luganda; Bunting (2009) on Ewe; Vanderelst (2010) and Howell (2013) on Yorùbá; and Baglini (2012) on Wolof. Ewe and Yorùbá, however, make use of a sub-type of exceed constructions, namely a serial verb construction, which is not attested in Luganda. Stassen (1985) also classes Wolof as a serial exceed language, although Baglini disputes this claim. Beyond these studies just mentioned, Beck et al. (2009) consider cross-linguistic variation in comparatives and degree constructions in 14 languages, including two that are exceed langauges (Moore and Yorùbá), and one that uses conjoined comparisons (Motu). Dahlstrom (2013) offers a description and preliminary syntactic analysis of a type of conjoined comparison in Meskwaki (Algonquian).

This dissertation thus not only contributes to the debate on semantic variation and universals, but also begins to fill a gap in the linguistics literature by providing detailed descriptions and analyses of under-studied construction types in under-studied languages.

1.5.2   Comparing comparisons

The morphosyntactic structures that are at issue in this dissertation vary widely across the languages we will be considering, and yet we seem to feel justified in classifying them all under the

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11. Stassen distinguishes separative, allative, and locative comparisons based on the lexical semantics of the adposition used as the standard marker. Following Stassen (2013), I collapse these categories together under the umbrella term *locative comparison*.

category of 'comparative construction'. An important methodological point, therefore, is to decide how we know that the types of structures we are looking at can indeed be classified as comparative constructions, so that we know whether we are in fact comparing like objects. Stassen (1985, p. 24) provides the following definitional criteria for identifying a comparative construction in a given language:

(17)   A construction in a natural language counts as a comparative construction . . . if that construction has the semantic function of assigning a graded (i.e. non-identical) position on a predicative scale to two (possibly complex) objects.

The definition in (17) constitutes a semantic definition of a comparative construction in the sense that it cross-cuts whatever morphosyntactic instantiation that construction may have in the object language. Haspelmath (2010) advocates using semantic definitions as a heuristic for identifying comparable construction-types across languages, rather than using what he calls "descriptive categories" based on language-specific categories that may not be found in all languages. The use of a semantic definition thus allows the researcher to abstract away from any morphosyntactic idiosyncrasies of one language that might obscure a common functional equivalence between construction types across languages, so that these constructions can be fruitfully compared.

A disadvantage of taking such an approach is that we run the risk of not having a specific enough definition of the phenomenon we are trying to study, leading us to make spurious generalizations about constructions that are not in fact alike, or miss generalizations that are specific to certain constructions but not others. To see what I mean by this, consider the English sentences in (18), each of which makes a comparison between Joe and Bill in some sense.

(18)   a. Joe is taller than Bill.

       b. Joe exceeds Bill in height.

       c. Joe's height is greater than Bill's.

       d. Joe is tall compared to Bill.

e. Joe is tall next to Bill.

f. Joe is tall, but Bill isn't very tall.

g. Between Joe and Bill, Joe is the tall one.

Each of these sentences is in some sense comparative in that we can infer that Joe is ordered above Bill on a scale of height, and thus would count as a comparative construction under the definition in (17). However, speakers of English recognize that only (18a) is considered the canonical comparative construction in this language. That is, (18a) has a special status in the language to the exclusion of the others. Recognizing this, Stassen (1985) makes a distinction between *primary* and *secondary* modes of comparison within a language, whereby the primary comparative construction is the "natural" or "unmarked" construction for expressing comparison in a language, and is generally in wider use than secondary alternatives (Stassen, 1985, p. 27). Under this view, (18a) is clearly the primary comparative construction in English, leaving the others to be considered secondary. However, even within the secondary comparisons, it seems clear that (18d) is privileged among the others in that is seems more 'natural' and in wider use than the others. At the same time, each of the 'secondary' comparisons has their own constraints on the sorts of contexts in which they can be used. Furthermore, since this distinction is not based on any semantic criteria, the primary/secondary opposition is pretty much a non-starter for the current project.

Another sense in which the definition in (17) casts too wide a net is that it glosses over other semantic distinctions between comparative constructions that have played an important role in the literature. For instance, Kennedy (2007a) notes that there are important semantic and pragmatic properties that distinguish constructions like (18a) from those like (18d). While a fuller exposition of the relevant properties will be delayed until the next chapter, the main analytical point that such research has shown is that the comparative meaning in (18a) is hard-wired in the semantics of the comparative morpheme *-er*, while in (18d) the comparison comes about via a pragmatic effect based on the contribution of the *compared to* phrase. Thus, both constructions receive a comparative interpretation, meaning that they both fall under definition (17); however, as shown

by Kennedy (2007a), there is a fundamental *semantic* difference in the ways in which the comparative interpretation comes about, which is not captured under the wide definition of comparative constructions.

Nevertheless, an important advantage of taking a more general definition of comparative constructions as the starting point is that it crucially does not presuppose any such distinctions from the outset. Given the No-Variation Hypothesis, it is essential that we start off without assuming any variation, and only posit points of variation after serious testing of the semantic properties of the specific constructions at issue.

In this dissertation, I will take the following approach: I will begin with the definition in (17) to identify constructions that can be used in Luganda and Washo to express comparison, namely those already introduced in (3)-(4). After thorough investigation of the semantic properties of these constructions, we will in chapter 7 re-evaluate the usefulness of definitions such as (17) in determining what counts as a comparative construction in a given language, and cross-linguistically.

1.5.3 Fieldwork methodology

Nearly all the data used in this dissertation comes from my own primary fieldwork with native speakers of Luganda and Washo. This is a practical necessity since the leading reference grammars on these languages provide little to no information on comparative constructions (Crabtree 1921; Ashton et al. 1954 for Luganda; Jacobsen 1964 for Washo). Most of the Luganda data were collected from a single adult male native speaker, though I also had some meetings with another male adult speaker, and a female adult speaker, all of whom were born and raised in Uganda, but have since immigrated to the Chicago area. The Washo data were collected from elicitation with two elderly native speakers living in the Washo communities in Northern California and Nevada.[12]

The actual fieldwork consisted mainly of direct elicitation with native speakers, largely following the methodological principles outlined by Matthewson (2004). The collection of data in

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12. The fieldwork consultants are thanked by name in the acknowledgments.

the field involved two types of tasks on the part of the language consultant: translations and judgments. First, a consultant was asked to translate sentences from the meta-language,[13] English, into the language of study. Alternatively, a context was presented visually, which the speaker is then asked to describe. The result of these tasks was a set of grammatical sentence types related to the domain of comparison and gradability. Once a body of grammatical sentences was available, the next step involved systematic probing for negative evidence. The process here involved manipulating morphemes on the part of the fieldworker in order to discover the full range of their combinatorial properties. During this step, consultants were asked for grammaticality judgments on sentences of the language of study. This stage of the fieldwork aimed at adducing the morphosyntactic properties of the morphemes and constructions in question.

In addition to the preliminary evidence offered by translations, the semantic investigation also involved asking consultants for truth value judgments for target language sentences situated in specific contexts. During this stage, a consultant was asked to give a judgment on a sentence offered by the fieldworker in a particular context, which had been presented to the consultant either orally or visually. English was the language used to present contexts orally, in large part because I am not yet fluent enough in the object languages to present the contexts in those languages. Crucially, the object language utterance offered by the fieldworker was one that has been shown to be grammatical in the previous stage of elicitation. This type of elicitation of semantic judgments from speakers represents a large proportion of the data collection for this project. I follow Matthewson (2004), who claims that it is legitimate to ask speakers forr judgments on the acceptability and truth of a sentence in context.

The details of specific elicitation techniques and their potential drawbacks are outlined by Matthewson (2004), and I do not intend to repeat all her arguments here. Further details on

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13. I borrow this use of the term 'meta-language' from Matthewson (2004) to refer to the common language spoken by the fieldworker and consultant, and to distinguish it from the object or research language that is being investigated. AnderBois & Henderson (2012), following Grenoble & Whaley (2006), use the term 'language of wider communication' for the meta-language.

elicitation techniques specific to comparison and gradability may be found in Bochnak & Bogal-Allbritten (2013), where we argue for using a mix of presenting discourse contexts orally and visually, and for a variety of context types that target the relevant distinctions.

I end this section by explaining the use of stigmata in the examples in this dissertation. A * is reserved for sentences that are analyzed as syntactically ungrammatical, or unacceptable in any context. A # is for sentences that are grammatical, but unacceptable in the particular context provided. A ?? indicates speaker variation in the acceptability of a sentence. This could represent either that different speakers had different judgments about a particular sentence, or that one speaker judged the acceptability of a sentence differently at different times.

1.6   Outline of dissertation

The remainder of the dissertation is organized as follows. In chapter 2 I review the current state-of-the-art in research on the syntax and semantics of comparative constructions. While most of this literature investigates comparative constructions in English, I also review some claims currently on the market regarding cross-linguistic variation in comparatives. In chapters 3 and 4 I discuss the exceed and cleft comparisons in Luganda. I apply tests outlined in chapter 2 to the comparative constructions in this language, and develop a formal analysis of these constructions. Specifically, I propose that *-singa* 'exceed' has a comparative semantics very similar to English *-er*. I conclude that the major points of variation between comparative constructions in English and Luganda lie mostly at the syntax-semantics interface, rather than at the level of lexical semantics. Then, in chapters 5 and 6, I discuss conjoined and locative comparisons in Washo. After applying the relevant tests from chapter 2, I conclude that neither construction makes use of a dedicated comparative morpheme along the lines of *-er* in English or *-singa* 'exceed' in Luganda. I propose that the variation observed between Washo and English lies in a difference in the lexical semantics of gradable predicates in these languages. This point of lexical variation has an effect on the syntax-semantics interface, as I show that Washo lacks degree constructions altogether as a result

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of this difference. Chapter 7 concludes by reviewing the cross-linguistic picture and re-evaluating Stassen's definition of comparative constructions in view of the findings in this dissertation.

Chapter 2

THE LANDSCAPE OF GRADABLE PREDICATES AND COMPARATIVES

2.1 Introduction

In this chapter, I lay out several aspects of the syntax and semantics of comparatives and related constructions. The topics discussed here will lay the groundwork for the analyses of Luganda and Washo in later chapters. I begin in section 2.2 with discussing the semantic properties of gradable adjectives, specifically with respect to vagueness, scale structure, and the differences between the positive (unmarked) and comparative forms. This exposition leads to the first major distinction to be investigated in this dissertation: explicit versus implicit comparisons (Kennedy, 2007a). In section 2.3, I compare the degree-based and vague predicate analyses of gradable predicates, and present arguments for and against each analysis for English, before concluding that the degree analysis does a better job at handling the facts. Then in section 2.4, I go over theories of the syntactic and semantic composition of comparative constructions, in particular highlighting the distinction between clausal and phrasal comparatives. While the main focus of the chapter is on how these theories work for English, certain aspects of cross-linguistic variation are considered in section 2.5.

Before getting started, I would first like to introduce some important terminology. I will refer to the unmarked form of the adjective in cases like (19) as the POSITIVE form. This form is not marked by any overt degree morphology, unlike the comparative form in (20), which is marked with the comparative morpheme *-er*.

(19) Joe is tall.

(20) Joe is taller than Bill.

According to typological research, English is in the minority of languages that have dedicated

comparative morphology that appears directly on the gradable predicate (Bobaljik, 2012; Stassen, 1985; Ultan, 1972). I assume that *more* that appears with gradable adjectives like *beautiful* is an allomorph of *-er* (cf. *more beautiful* vs. **beautiful-er*; see Embick (2007) for discussion). In (20), Joe is the TARGET of comparison, while Bill is the STANDARD of comparison. Correspondingly, *than* is referred to as a standard marker, and the *than* constituent the standard phrase. Other terminology will be defined as needed when introduced.

2.2 Semantic properties of gradable predicates and comparatives

2.2.1 Vagueness in gradable predicates

Much of the literature on the semantics of gradable adjectives has focused on the fact that a subset of them, and indeed the most prototypical of them, are vague in the positive form (Barker, 2002; Fara, 2000; Fine, 1975; Kamp, 1975; Kennedy, 2007c, 2011; Klein, 1980; van Rooij, 2011, among others). There are three characteristic properties of vagueness. First, sentences with vague predicates are subject to contextual variability in their truth conditions. That is, it is not a matter of fact whether Joe, who has a height of 5'8" counts as tall or not. If Joe is a fifth-grader and we are comparing him with other boys in his class, then the sentence *Joe is tall* is intuitively true. However, if Joe is an adult male and we are comparing him with other members of his professional basketball team, then the same sentence is intuitively false. Facts such as these have led to the common view that the interpretation of vague gradable predicates depends on a comparison class, i.e., the set of objects relative to which we derive a standard (Cresswell, 1976; Klein, 1980; Kennedy & McNally, 2005; von Stechow, 1984, among others). The comparison class may be left implicit, or be named by a *for*-PP (e.g. *Joe is tall for a fifth-grader*). Not all context-sensitive predicates are vague, but all vague predicates seem to be context-sensitive.

Second, vague predicates give rise to so-called 'borderline cases'. In any context, there are certain objects that clearly count as, say, tall, certain objects that clearly count as not-tall (assuming

that a partition among the domain should not leave either the positive or negative extension empty; Klein 1980), but also typically a third group where we are not sure. If we are again talking about adult males, Bill who is 6'2" is clearly tall, Charlie who is 5'4" is clearly not tall, but what about Dave, who is 5'10"? Does he count as tall or not tall? He seems to fall into a group where we're not sure. Dave is thus a borderline case in this context.

Third, vague predicates give rise to the Sorites Paradox (paradox of the heap), as shown in (21):

(21)   The Sorites Paradox:

P1: An adult male who is 6'2" counts as tall.

P2: Any adult male who is 1mm shorter than a tall adult male also counts as tall.

C: Therefore, any adult male who is 1' counts as tall.

The basis of the paradox is that the premises P1 and P2 seem intuitively valid, yet the conclusion is intuitively false. There seems to be something wrong with recursively applying P2 so that we avoid drawing the conclusion, but where do we stop? There is no cut-off point where we can decide when a person stops counting as tall.

Gradable adjective like *tall*, *deep*, and *expensive* display these properties associated with vagueness. In addition to these properties, vague predicates are also subject to certain constraints on their use. One is the Similarity Constraint in (22):

(22)   Similarity Constraint:

When *x* and *y* differ only to a very small degree in the property that a vague predicate *g* is used to express, we are unable or unwilling to the proposition that *x* is *g* is true and that *y* is *g* is false.   (Klein, 1980; Fara, 2000; Kennedy, 2011)

Vague predicates require their subject arguments to 'stand out' relative to others in the comparison class to be used truthfully (Kennedy, 2007c). If we are willing to claim that Joe is tall at 6'2", then it seems highly unlikely that Bill would count as not-tall if he is only 1mm shorter than Joe. The Similarity Constraint seems to be what is at work in the Sorites Paradox in (21), and explains

why we accept the second premise as true. When there is only a small (but perceptible) difference between two objects with respect to, say, height, we are unable to judge one as tall and the other not.

Another set of constraints on the use of vague gradable predicates come in the form of the Consistency Constraints, stated in (156):

(23) Consistency Constraints: (Klein, 1980, 1991; Kennedy, 2011)

    a. For any positive form gradable predicate g and objects x and y, and for any context c, if g holds of x but not of y in c, then x exceeds y relative to the scalar concept encoded by g.

    b. For any positive form gradable predicate g and objects x and y, if there is a context c such that g holds of x but not of y in c, then for any c' such that g holds of y in c', then g also holds of x in c'.

The first constraint says that if we are willing to count Pam as tall and Angela as not tall, then it follows that Pam's height exceeds Angela's. The second constraint says that if Pam's height exceeds Angela's, and we are willing to say that Angela counts as tall, then Pam also counts as tall.

These properties of vague predicates characterize the interpretation and use of a subset of positive-form gradable adjectives in English. We will refer back to them in section 2.2.4, when I show how these properties conspire to allow the positive form of these predicates to support making comparisons.

2.2.2 The typology of scale structure

While vague gradable predicates have historically received the most attention in the analysis of gradable adjectives and comparison, there is a subset of gradable adjectives that do not have vague interpretations. An example is *wet*: an object counts as wet if it has a non-zero amount of moisture. In this case, there *is* a fact of the matter for when an object counts as wet. Another example is

straight: an object counts as straight if it has zero amount of bend. Such predicates are not subject to the same kind of contextual variability as predicates like *tall*, and do not give rise to borderline cases or the Sorites Paradox. In particular, we are not likely to accept the second premise of the paradox:

(24)   Sorites gone awry with *straight*:

P1: A nail that is completely straight counts as straight.

P2: #A nail that has a slightly larger degree of bend than a straight nail also counts as straight.

This distinction between those predicates that display properties of vagueness and those that do not can be cached out in terms of scale structure (Yoon, 1996; Rotstein & Winter, 2004; Kennedy & McNally, 2005; Kennedy, 2007c, among others). The first major distinction to be made is in terms of type of standard encoded, namely whether it is RELATIVE or ABSOLUTE. Vague gradable adjectives like *tall* have a relative standard that is context-dependent. Non-vague gradable predicates like *wet* or *straight* have endpoint-oriented standards, which do not vary across contexts in the same way. The term 'endpoint-oriented' already makes reference to the types of scales these predicates encode. Kennedy & McNally (2005) argue that a scale consists of three parts: a set of degrees, an ordering relation on those degrees (i.e., its polarity), and a dimension. The set of degrees may include a maximum element, a minimum element, both, or neither. A gradable predicate whose scale contains a maximum or minimum element will have its standard fixed to one of those values, and will have an absolute interpretation. To continue with our examples from above, *wet* has a minimum absolute standard, while *straight* has a maximum absolute standard. Kennedy (2007c) claims that the standards for such gradable adjectives are fixed in the way that they are because the endpoints of the scales 'stand out' relative to the rest of the degrees on the scale for being endpoints. For gradable adjectives whose scales do not contain a maximum or minimum element, some other standard must be chosen. Since no degree on such a scale inherently 'stands out', a standard must be determined by context. Absolute gradable adjectives therefore do not depend on

a comparison class for determining their standard.[1]

Kennedy & McNally (2005) argue that modifier selection is sensitive to scale structure. Specifically, certain modifiers track whether a scale includes a maximum or minimum element or not. For instance, the modifiers *completely* and *100%* make reference to a maximal endpoint. If these modifiers can felicitously combine with both members of an antonym pair, then it reveals that the scale has both maximum and minimum elements. If the modifiers are only felicitous with one member of the antonym pair, then the scale has either a maximum or minimum element, but not both. If the modifiers cannot combine with either member of an antonym pair, then the scale lacks both maximal and minimal elements. Kennedy & McNally show that the range of gradable adjectives in English exhaust these four possible scale types, as shown in (25)-(28):

(25)   Closed scale pattern (maximum and minimum elements present)

    a. The room was 100% full/empty.

    b. The flower was completely open/closed.

(26)   Upper closed scale pattern (maximum element only)

    a. This product is 100% pure/#impure.

    b. The treatment in completely safe/#dangerous.

(27)   Lower closed scale pattern (minimum element only)

    a. The pipe is 100% #bent/straight.

    b. That author is completely #famous/unknown.

(28)   Open scale pattern (no maximum or minimum element)

    a. Her brother is completely #tall/#short.

    b. The pond is 100% #deep/#shallow.

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1. This view has recently been corroborated by experimental evidence (e.g. McNabb, 2012b), which shows that speakers' judgments on whether an absolute gradable predicate holds is not affected by a comparison class.

Meanwhile, *very* only modifies relative-standard predicates, whose standard must be derived from a comparison class. It is thus typically infelicitous with absolute gradable predicates.[2]

(29)   a.   The bottle is {very/#completely} tall.

       b.   The bottle is {completely/#very} closed.

The split between relative and absolute gradable adjectives is therefore linguistically significant. Only the former display the behaviors associated with vagueness, and derive their standard from context. Nevertheless, non-vague predicates like *wet* and *straight* are gradable, just like vague ones like *tall* and *expensive*. Relative and absolute gradable predicates alike can appear with degree modifiers, as in (25)-(29), and, significantly, comparatives. What we will see below, though, is that the semantic distinctions between positive-form relative and absolute standard gradable adjectives are neutralized in comparatives.

2.2.3   Beyond the positive form: comparatives and measure phrases

Despite differences in vagueness and contextual variability in the positive form, relative and absolute gradable predicates alike can appear in comparative constructions with ease, as shown in (30). This property distinguishes absolute gradable adjectives with truly non-gradable predicates like *dead*, as in (31), and non-adjectival predicates, as in (32). Even so-called 'gradable nouns' (Morzycki, 2009) do not readily appear in comparative constructions.[3]

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2. See Kennedy & McNally (2005), Syrett (2007), and McNabb (2012b) for some qualifications on this point.

3. Nouns can appear in comparative constructions like in (1)-(2):

(1)   a.   Joe is more of a semanticist than Bill is.

      b.   Joe is more (of a) semanticist than (a) phonologist.

(2)   Joe is more of an idiot than Bill is.

The comparatives in (1) are metalinguistic, and (2) crucially requires *of* and the indefinite article. Going forward, I set aside these sorts of comparatives.

(30)   a. Joe is taller/shorter than Bill.

       b. This glass is more full/emptier than that one.

       c. This nail is straighter/more bent than that one.

(31)   #This rabbit is more dead than that one.

(32)   a. #Joe is more semanticist than Bill.

       b. #Joe is more idiot than Bill.

We are therefore justified in taking absolute gradable adjectives to be fundamentally similar to relative gradable adjectives, to the exclusion of truly non-gradable predicates.

When vague gradable adjectives appear in comparatives, they lose the characteristic properties of vagueness discussed in section 2.2.1. For instance, Sorites sequences no longer go through, since we are unwilling to accept the second premise as valid, as shown in (33). Relative and absolute gradable predicates pattern alike in this respect.

(33)   Sorites gone awry with *taller than Bill*:

       P1: An object that is 1cm taller than Bill counts as taller than Bill.

       P2: #An object that is 1mm shorter than an object that is taller than Bill also counts as taller than Bill.

Comparatives behave like minimum-standard gradable adjectives: the predicate *taller than Bill* is true of an object if there is a non-zero difference between its height and that of Bill.

Another property of comparatives is that we draw no inferences that the positive form holds of the objects being compared. We therefore say that the comparative is not norm-related: its interpretation does not depend on whether the standard for the positive form is met (Bierwisch, 1989; Rett, 2007, 2008).

(34)   a. Joe it taller than Bill. ↛ Bill is tall.

       b. This glass is more full than that one. ↛ That glass is full.

c. This towel is more wet than that one. ↛ That towel is wet.

Measure phrase constructions also eliminate vagueness associated with the positive form, in predicates that allow them. Once again, we observe that the Sorites Paradox does not go through because we are unwilling to accept the second premise as valid, as shown in (35). Likewise, measure phrase constructions are not norm-related: we do not draw any inference that the positive form holds, as shown in (36).

(35) Sorites gone awry with *five feet tall*:

P1: An object with a height of five feet counts as five feet tall.

P2: #An object that is 1mm shorter than an object that is five feet tall also counts as five feet tall.

(36) Joe is five feet tall. ↛ Joe is tall.

We have arrived at the following empirical picture. Positive-form gradable adjectives fall under two classes: relative and absolute. Relative gradable adjectives are vague in the positive form, whereas absolute gradable adjectives are not. However, in other degree constructions, such as comparatives and measure phrase constructions, the semantic properties of the positive form no longer hold: there are no inferences that the positive form holds, and adjectives in the comparative are uniformly non-vague. These differences between degree constructions that give rise to vagueness and those that do not will form the basis of a distinction introduced immediately below, namely that of explicit versus implicit comparison.

2.2.4   Explicit and implicit comparison

The properties of vague gradable predicates discussed in section 2.2.1 make it possible for them to be used to make comparisons, even without the use of a dedicated comparative construction (in English, without *-er*). For instance, the sentences in (37) can be used to make comparisons between Amy and Betty, but only the first one uses comparative morphology.

(37)   a.   Amy is taller than Betty.

         b.   Compared to Betty, Amy is tall.

         c.   Amy is the tall one (out of Amy and Betty).

The forms in (37b) and (37c) are still in some sense comparative, yet they only make use of the positive form. That the positive form of vague predicates can be used to make comparisons in this way follows from two features of their use. First, their standards are context-dependent, and based on a comparison class. A common view about sentences like (37b) and (37c) is that they restrict the comparison class to only Amy and Betty (Kennedy, 2007a, 2011; van Rooij, 2011). Assuming that the partition between what counts as tall, and what counts as not-tall should be non-trivial, such an operation places Amy in the positive extension of *tall*, and Betty in the negative extension. Second, given the Consistency Constraints in (156), it follows that if in a give context Amy counts as tall, and Betty does not count as tall, then we can automatically conclude that Amy is taller than Betty. Based on this reasoning, comparison is possible with the positive form of vague predicates under certain conditions.

This observation led Kennedy (2007a) to propose a split between two modes of comparison. Borrowing terminology from Sapir (1944), Kennedy refers to these modes as explicit and implicit comparison. Their definitions are given in (38):

(38)   a.   *Explicit comparison*: establishes an ordering relation between objects x and y with respect to a gradable property g using a morphosyntactic form whose conventional meaning has the consequence that the degree to which x is g exceeds the degree to which y is g.

         b.   *Implicit comparison*: establishes an ordering between objects x and y with respect to a gradable property g using the positive form by manipulating the context in such a way that the positive form is true of x and false of y.

                                                         (Kennedy, 2007a)

The key distinction between explicit versus implicit comparison is that the former makes use of dedicated morphology to express the comparison relation, while the latter uses only the positive unmarked form, and a comparison between two objects is inferred. The prediction is that a language has no explicit comparative morpheme should use only an implicit comparison strategy.

According to Kennedy (2007a), there are at least three tests that distinguish explicit from implicit comparison. These tests target the semantic differences between the comparative and positive forms of gradable predicates. Importantly, what we find is that the semantics of implicit comparison reflects that of the positive form, in particular with respect to vagueness and context-sensitivity, which is expected since there is no dedicated comparative morphology present. The three relevant tests are the following: (i) (non-)acceptability of the comparison in crisp judgment contexts; (ii) (non-)acceptability of the comparison with minimum standard predicates; and (iii) (non-)acceptability with differential measure phrases.[4]

Crisp judgments: Since the positive form of relative gradable predicates are vague, implicit comparisons should also display these properties, since they are based on the positive form. In particular, their use is subject to the Similarity Constraint in (22): if one object counts as tall, then it is difficult or impossible to judge another object as not-tall if there is only a very slight difference in their heights. This makes a prediction about implicit comparisons: since they are based on the positive form, then should also be subject to the Similarity Constraint. It should therefore be impossible to use them in situations where two objects differ only slightly in the amount they hold a property. Such an operation would mean that we would have to claim that one object 'stands out' in the extent to which holds a property while the other one does not, contrary to the Similarity Constraint. The contrasts in (39)-(40) show that this prediction is borne out. A 3-word difference in essay length is not enough for the longer essay to 'stand out', and the intended implicit comparison

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4. Sawada (2009) also identifies a fourth test: negative implicature to the positive form. He claims that implicit comparisons actually lead to the implicature that the positive form actually holds of neither of the two objects compared. I will not consider this test here, since the judgments are somewhat delicate.

is infelicitous.

(39) Context: A 600 word essay and a 200 word essay.

   a. This essay is longer than that one.

   b. Compared to that essay, this essay is long.

(40) Context: A 600 word essay and a 597 word essay.

   a. This essay is longer than that one.

   b. #Compared to that essay, this essay is long.

Explicit comparisons do not give rise to any difficulty here. As shown in section 2.2.3, *-er/more* comparatives do not give rise to vagueness. They simply require a non-zero difference between the two objects being compared. The explicit comparative in (40a) is thus true and felicitous even in a crisp judgment context.

Absolute standard predicates: As we have already noted, absolute-standard gradable predicates do not show the context-sensitivity and vagueness of relative-standard predicates. The standards for evaluating the positive form are fixed to a scalar endpoint and do not depend on a comparison class. The prediction is therefore that implicit comparisons with absolute-standard predicates should be infelicitous. Kennedy claims that this is because they crucially require narrowing down the comparison class, and this operation has no semantic effect on the interpretation of absolute gradable predicates. But in fact the problem runs deeper than that. If, as Kennedy claims, the function of an implicit comparison is to claim that one object counts as holding the property, while the other does not, then an implicit comparison with absolute predicates will always be false, except in the limiting cases where one object holds the property to the maximum or minimum value.

Explicit comparisons, however, should be fine, since once again, they only require a non-zero difference in the amount the objects being compared hold the property. These predictions are borne out, as shown in (41):

(41) Context: Rod A: Rod B:

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    a. Rod B is more bent than rod A.

    b. #Compared to rod A, rod B is bent.

Measure phrases: Measure phrase constructions are another environment where vagueness and context-sensitivity disappears, as observed in section 2.2.3. Once again, there is no contextual standard to manipulate in these cases, making the prediction that implicit comparisons should be infelicitous with measure phrase constructions. By contrast, measure phrases are acceptable with explicit comparisons, as shown in (42):

(42)   a. Pam is 1 foot taller than Angela.

       b. #Compared to Angela, Pam is 1 foot tall.

There is a bit of a caveat here: the measure phrase necessarily receives a differential interpretation with explicit comparatives, which seems impossible with implicit comparisons. Kennedy treats this fact as part of the diagnostic itself. The explicit comparative states that there is a difference between two individuals, and the measure phrase measures that difference.

In sum, these three tests are based on the semantic differences between the positive form and the comparative that we observed earlier in this section. Relative gradable predicates are vague, and thus implicit comparisons formed with these predicates inherit this behavior as well. By contrast, explicit comparisons, like the *-er* comparative in English, apparently erase any vagueness associated with the positive form. As we have seen, these differences make predictions about when implicit comparisons should be (im)possible, and allow us to distinguish implicit from explicit comparison constructions.

2.2.5 Summary

This section focused on some of the general properties of gradable predicates in English in their positive and comparative forms. Both the positive and comparative forms of relative-standard gradable predicates support the ability to make comparisons between individuals. Following Kennedy

(2007a), we distinguished between these two modes of comparison as implicit and explicit comparison. This distinction tracks the semantic differences between the positive and comparative forms of gradable predicates, specifically with respect to vagueness and context-sensitivity. Given that relative gradable predicates give rise to vagueness in the positive form, implicit comparisons also display these features.

We have therefore already encountered one way in which comparison constructions may differ: whether they make use of a specialized morphosyntactic form that encodes a semantics of comparison, or whether they are based on the positive form. This distinction was exemplified here in terms of two means for expressing comparisons in English. However, this distinction could also form the basis for a point of cross-linguistic variation as well. If we assume that all languages have a positive form of gradable predicates, and that the features of vagueness are not language-specific, then it follows that all languages should have some sort of implicit comparison. By contrast, given that languages may differ according to the inventory of functional morphology, it is conceivable that a language may lack a dedicated comparative morpheme, and correspondingly lack explicit comparisons. In later chapters, I will therefore apply the tests for explicit and implicit comparisons to the comparison constructions in Luganda and Washo. Previewing the outcome, it will be shown that Luganda has both explicit and implicit comparisons, while Washo only has implicit comparisons.

2.3 The semantics of gradable predicates and degree morphology

Up to now, I have largely avoided assuming any particular semantic analysis of gradable predicates, comparatives, and other degree morphology. There are essentially two main groups of analyses for gradable adjectives, which can be referred to as DECOMPOSITIONAL and NON-DECOMPOSITIONAL. Decompositional analyses hold that both the positive and comparative forms of gradable adjectives are derived from a common, more abstract underlying source. This underlying form does not have a semantic type that can be predicated directly of an individual, but must combine with (covert) mor-

phology (or undergo a type-shift) to be used as a predicate. This same underlying form combines directly with comparative morphology to yield the comparative form. A schematic representation is given in (43). By contrast, non-decompositional analyses maintain that the positive form of gradable adjectives is the most basic form, and that the comparative is derived from this form. A schematic representation of this style of analysis is given in (44).[5]

(43) adjectival root

    +POS   +COMP

  positive form   comparative form

(44) adjectival root = positive form

         +COMP

     comparative form
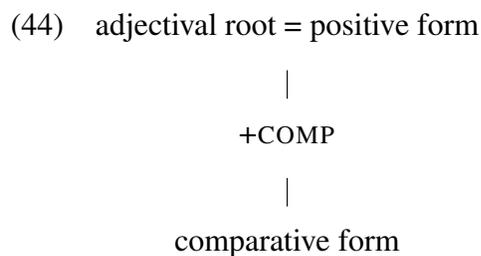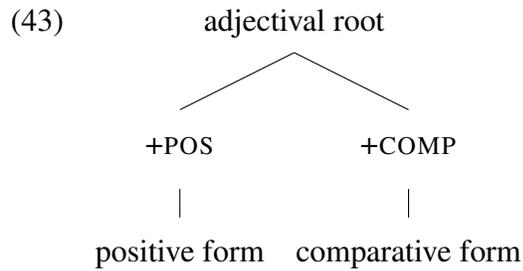
In this section I discuss each type of analysis in turn, and how they account for the data presented in the previous section. Since by far the most common type of decompositional analysis is one that is based on degree semantics, I focus the discussion on that style of analysis, and largely follow the particular implementation of Kennedy & McNally (2005). To represent non-decompositional analyses, I largely follow the implementation of Klein (1980). I then consider arguments for and against each style of analysis, and conclude that the decompositional analysis can better handle the facts from English.

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5. The schematizations in (43) and (44) are inspired by those found in Francez & Koontz-Garboden (2012).

2.3.1 Degree-based analyses

Under the degree analysis of gradable predicates, the basic semantic building block of gradable predicate meanings is a measure function (Cresswell, 1976; Heim, 1985, 2001; Kennedy, 1997, 2007c; Kennedy & McNally, 2005; Rullmann, 1995; von Stechow, 1984, among many others). Such functions relate individuals to a degree on a scale. For instance, the measure function **height** maps an individual to its degree of height. This type of analysis therefore recognizes degrees as part of the semantic ontology.[6] Accordingly, gradable predicates are taken to denote relations between degrees and individuals, as in (45), where d is a degree variable:[7]

(45) $[\![\,tall\,]\!] = \lambda d \lambda x.\mathbf{height}(x) \succeq d$

Under this view, gradable adjectives denote functions from degrees to functions f from individuals to truth values, such that for any degree d, $f(x)$ is true if and only if x's degree on the scale encoded by the adjective is greater than or equal to d.

Gradable predicates therefore cannot be predicated of an individual directly. The degree argument must first be closed off in order to derive a predicate of individuals. This is the role of degree morphology in this system. Degree morphology combines with gradable adjective meanings, and places a restriction on the value of the degree argument. Degree morphemes differ from one another in the sort of restriction they place on the degree variable. Kennedy & McNally (2005) model the general case as in (46), where G is a variable over gradable predicates of type $\langle d, et \rangle$, and **R** is

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6. Degrees are often taken to be semantic primitives, but some authors claim they are derived from equivalence classes, see e.g. Cresswell (1976), and more recently Bale (2008) and Anderson & Morzycki (To appear).

7. A line of research claims that in their underlying form, gradable adjectives directly denote the measure functions, along the lines of (1), and are consequently type $\langle e, d \rangle$ (Bartsch & Vennemann, 1972; Kennedy, 1997, 2007c):

(1) $[\![\,tall\,]\!] = \lambda x.\mathbf{height}(x)$

This style of analysis is still a degree-based analysis, which recognizes scales and degrees as part of the semantic ontology. Going forward, I therefore treat the 'measure function' analysis as equivalent to the 'degree argument' analysis in (45).

a variable over the restriction placed on the degree argument.[8]

(46) $[\![\text{Deg}]\!] = \lambda G \lambda x. \exists d[\mathbf{R}(d) \wedge G(d)(x)]$ (Kennedy & McNally, 2005, p. 367)

Among the degree constructions analyzed in this way are the comparative, where $\mathbf{R}$ places the restriction that d be greater than some other degree derived from the standard phrase, measure phrases, where $\mathbf{R}$ restricts d to degrees greater than or equal to the degree named by the measure phrase, and also degree adverbs such as *very* and *completely*, and equatives and superlatives. A sketch of how comparatives work in this framework is given in (47)-(48), where the comparative phrase *-er/more than d_c* restricts the degree variable from the gradable adjective to those that are greater than a standard d_c derived from the standard (*than*) phrase. The result of combining this meaning with the gradable adjective *tall* is a property of individuals x that is true if there exists a degree of height that exceeds d_c, and x's height is at least as great as that degree.[9]

(47) $[\![\text{-er/more than } d_c]\!] = \lambda G \lambda x. \exists d[d \succ d_c \wedge G(d)(x)]$

(48) $[\![\text{taller than } d_c]\!] = [\![\text{-er/more than } d_c]\!]([\![\text{tall}]\!]) = \lambda x. \exists d[d \succ d_c \wedge \mathbf{height}(x) \succeq d]$

Degree constructions are thus taken to form a paradigm of functional morphology that targets the degree variables encoded in gradable adjective meanings.

The degree analysis can nicely handle the combinatorics of gradable predicates and degree morphemes. However, in the case of an unmodified gradable predicate (i.e., the positive form), a fix is required, since the gradable predicate is not of the right type to be used as a predicate

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8. This view makes the syntactic assumption that degree morphemes take adjectives (or adjective phrases) as their complement. An alternative would be to let degree morphemes denote degrees, which can then directly serve to saturate the degree argument position of the gradable adjective. I discuss these different views in more detail in section 2.4.1.

9. This treatment of comparative phrases glosses over many details of the syntax and semantic composition of comparatives. More detailed treatments of the composition of comparatives will be discussed in section 2.4, where (47) and (48) will be revised.

of individuals; the degree argument must first be discharged. In this case, the degree analysis posits the phonologically null POS morpheme as in (49), which binds the degree argument, and returns an $\langle e,t \rangle$ predicate. In addition, POS ensures that d exceeds a standard of comparison for the gradable adjective G, represented as s_G, and states that x holds G to the degree d. The result of the composition of POS with a gradable adjective meaning is given in (50).

(49) $[\![\text{POS}]\!] = \lambda G \lambda x. \exists d [d \succ s_G \wedge G(d)(x)]$

(50) $[\![\text{POS}]\!]([\![\textit{tall}]\!]) = \lambda x. \exists d [d \succ s_{\textit{tall}} \wedge \mathbf{height}(x) \succeq d]$

That is, the norm-related interpretation of the bare form is not lexicalized in the gradable adjectives themselves, but rather is contributed by POS. What is pronounced on the surface as the positive form of a gradable adjective is not a basic form, but derived as in 50) through the composition of the degree relation with POS. It is in this sense that this style of analysis for gradable adjectives is decompositional.

Under a degree-based analysis, it is easy to make the distinction between gradable and non-gradable predicates. Non-gradable predicates like *dead* do not come equipped with a degree argument, and therefore cannot combine with degree morphology. Scale structure and the relative-absolute distinction can also be captured. Scales are conceived as a set of degrees, which can contain a maximum element, a minimum element, or neither. The relative-absolute distinction can therefore be modeled in terms of scale structure, i.e., the nature of the set of degrees, and by making further specifications on how the standard degree is determined by POS. For absolute-standard adjectives, the standard defaults to the maximum or minimum value on the scale. For relative-standard adjectives, scale endpoint are not used as the standard value (because in the typical case the relevant scale does not contain a maximum or minimum value), and the standard must be derived by making reference to a comparison class. (See Kennedy (2007c) for a more detailed proposal on how this can be done in this system.)[10] Furthermore, the vagueness of positive form

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10. To be sure, there are relative uses of absolute gradable adjectives.

relative adjectives is derived from the application of POS. Vagueness is not an inherent feature of the underlying meanings of gradable predicates in (45), which is explains why these adjectives do not display vagueness in comparatives and with measure phrases. POS is in complementary distribution with these other degree morphemes, which means that features of vagueness are not present when POS is not present.

This brief overview constitutes the main background on the degree-based analysis of gradable predicates and degree morphology in English. I now turn to the other major type of analysis for these phenomena, one that denies the existence of degrees as a distinct semantic type.

2.3.2 *Vague predicate analyses*

The second major type of analysis for gradable predicates treats them as context-sensitive vague predicates (Kamp, 1975; Klein, 1980; van Rooij, 2011, among others). Such an analysis makes no use of degrees, although it assumes that the domain of individuals must be (partially) ordered with respect to the dimension encoded in the adjective. The meaning of a gradable adjective like *tall* is simply a contextually-determined set of individuals, based on a comparison class. Such a meaning can be modeled as in (51), where **tall** is a function from individuals to truth values.

(51) $[\![\, tall \,]\!]^c = \lambda x.\textbf{tall}(x)$ in c

However, rather than being an $\langle e,t \rangle$ function of the regular sort, vague predicates like (51) denote partial functions. Instead of assigning 'true' or 'false' to each individual in the domain, the function will in some cases fail to assign a truth value to an individual, namely the borderline cases. This group of individuals forms the 'extension gap' of the predicate. The individuals that

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(1)   The climate in Phoenix is dry. (relative to other US cities)

(2)   The theater is empty tonight. (relative to its usual occupancy)

In these uses, absolute adjectives behave just like relative adjectives with respect to vagueness and context-sensitivity. See Kennedy & McNally (2005) for more discussion of cases like these.

get assigned to 'true' form the positive extension of the predicate, while those that are assigned to 'false' form the negative extension. Under this view, gradable adjectives denote predicates of individuals directly. There is no appeal to a covert POS morpheme to shift the meaning of a gradable predicate to a property of individuals. The features of vagueness are directly associated with the meaning of the gradable adjective. In this sense, this style of analysis for gradable adjectives is non-decompositional.

Under this analysis, degree constructions operate over the contextual parameter c associated with the gradable adjective meaning. The meaning of *very*, for instance, constitutes a higher-order application of the predicate *tall* on the domain. The meaning of *very tall* is essentially the same as the meaning for *tall* in (51), except for how the value of c is assigned. Whereas in the positive form, c consists of all the relevant individuals in a comparison class, for *very tall*, the relevant context is restricted to those individuals that already count as tall in c. That is, the individuals that count as *very tall* in c are those that count as tall among those that count as tall in c.

Comparatives in turn existentially quantify over possible values of c. A comparative statement as in (52) is true if there exists a context c such that Joe counts as tall in c, but Bill does not count as tall in c, as represented in (53).

(52) Joe is taller than Bill.

(53) $\exists c[\textbf{tall}(j) \text{ in } c \wedge \neg\textbf{tall}(b) \text{ in } c]$

Given the Consistency Constraints in (156), it follows that if the truth conditions in (53) hold, then Joe is taller than Bill.

Measure phrases under this account are taken to denote equivalence classes of objects (Klein, 1980, 1991). That is, *five feet* denotes an equivalence class of objects that measure five feet in height, and the sentence *Joe is five feet tall* is true if and only if Joe in non-distinct from an object in that equivalence class with respect to height.

Non-gradable adjectives in this system denote total functions, as opposed to partial ones, and their domains are not ordered. Their interpretation does not depend on the contextual parameter

53

c, and so operations like comparison and modification by *very* are not defined for non-gradable predicates.

The distinction between relative and absolute adjectives is a bit more difficult on this view, since Kamp and Klein did not have this distinction in mind at the time, and assumed all gradable predicates were vague and behaved like *tall*. In part, this is due to the fact that the relative-absolute distinction did not come to the forefront of research on gradable adjectives until much later (Hay et al., 1999; Kennedy, 2007c; Kennedy & McNally, 1999, 2005; Rotstein & Winter, 2004). Intuitively, as we have already discussed, absolute gradable adjectives are not context-sensitive or dependent on a comparison class the way that relative adjectives are. However, eliminating the contextual parameter *c* from their interpretation collapses absolute adjectives with non-gradable adjectives, which not a desirable result. Recently, Burnett (2011, To appear) has argued that even absolute gradable predicates do give rise to borderline cases, and can in some sense can still be considered vague in the relevant way that allows absolute predicates to support comparison in the way described in this section. The problem arises, though, that there is still no way to formally distinguish relative from absolute adjectives under this view.[11]

2.3.3   Deciding between the two accounts for English

In this section, I compare the degree analysis with the vague predicate analysis, and how they each handle the data in English with respect to the behavior of gradable adjectives and degree constructions. While both types of analyses each have their own merits and drawbacks, I ultimately conclude that the degree analysis is better equipped to handle the English facts.

First considering the vague predicate analysis, there are two major motivations for preferring such an analysis for gradable predicates over a degree-based analysis. For starters, Klein (1980)

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11. A recent suggestion by McNally (2011) that scale structure effects may be derived from more basic cognitive processes of classification may help in this regard. I take up this suggestion later on in chapter 6 in discussing scale-structure effects in Washo.

argues that relying on degrees involves positing "unjustified complexity" (p. 4) into the ontology of primitive semantic types. Indeed, an analysis that gets all the facts right without positing extra theoretical machinery would be more parsimonious than one that requires innovating an extra logical type, assuming equal empirical coverage.

Perhaps a more serious objection to the degree analysis of scalar predicates is that it is necessary to make recourse to the null POS morpheme in the interpretation of the positive form. Much typological work has observed that across languages, the comparative form tends to be more marked than the positive form (Bobaljik, 2012; Stassen, 1985; Ultan, 1972), whereas under the degree analysis both the positive form and the comparative form are marked by degree morphology. Worse, there seem to be no languages at all that overtly lexicalize POS.[12] Klein concludes that for these reasons, a non-decompositional, non-degree semantics for scalar predicates and degree constructions is more desirable than one that implicates degrees.

Furthermore, as noted by Doetjes et al. (2009), the vague predicate analysis has the benefit of not assigning any special status to adjectives in general. This means that the analysis can easily be transferred to vagueness and gradability found in other categories, such as nouns (cf. Morzycki, 2009; Constantinescu, 2011).

However, despite these objections, there are reasons to believe that a decompositional, degree-based analysis for English degree constructions should be preferred over a vague predicate analysis. First, as we have already seen, the vague predicate analysis meets with some difficulty in accounting for the relative-absolute distinction. However, since the degree analysis makes use of scales consisting of degrees, the relative-absolute distinction can be captured by making reference to those degree scales, and specifically whether they include maximum or minimum values.

Second, as argued by von Stechow (1984), the vague predicate analysis has difficulty with differential measure phrases in comparatives, such as (54):

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12. Bogal-Allbritten (2008) claims that POS is overtly marked in Navajo, a position which is later retracted in Bogal-Allbritten (2013).

(54)   John is six inches taller than Mary.

Under Klein's system, measure phrases like *six inches* are treated as equivalence classes of objects whose height/length is six inches. Such a formulation can handle non-differential uses of measure phrases as in *John is six feet tall*. However, the comparative in (54) does not entail that either John or Mary are members of the set of objects whose height is six inches, and so this formulation of measure phrases cannot handle their differential use in comparatives. For this reason, von Stechow argues that the vague predicate analysis cannot be modified to handle such cases, rendering this view empirically inadequate. Rather, degrees are necessary to handle cases such as (54). In particular, von Stechow argues that measure phrases name degrees, providing an analysis of (54) along the lines of (55) (following the analysis of Hellan, 1981):[13]

(55) $\exists d_1, d_2, d_3$[John is d_1-tall & Mary is d_2-tall & $d_1 = d_2 + d_3$ & $d_3 = 6$ inches]

In prose, the analysis is that (54) means that there exists a degree to which John is tall, a degree to which Mary is tall, and a degree that equals 6 inches, and that the degree to which John is tall is equal to the degree to which Mary is tall plus 6 inches. Since degrees are at the very least necessary to account for differential measure phrases, von Stechow argues that the degree analysis is superior to the vague predicate analysis for English in terms of empirical coverage.

A third objection against the empirical adequacy of the vague predicate analysis is raised by Kennedy (2011). Under the vague predicate analysis, a comparative sentence is true if there exists a context such that the predicate is true of the target of comparison, but is false of the standard (Kamp, 1975; Klein, 1980). For example, (56) has the truth conditions in (57), repeated from above.

(56)   Joe is taller than Bill.

(57) $\exists c[\mathbf{tall}(j) \text{ in } c \wedge \neg\mathbf{tall}(b) \text{ in } c]$

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13. Such an analysis assumes that the operation of addition is defined for degrees. See Sassoon (2010, 2013) for discussion.

Kennedy's objection to this view comes into play when we consider crisp judgment contexts. Specifically, he argues that the vague predicate analysis is ill-equipped to handle the differences between explicit and implicit comparisons, and in particular distinctions like in (58):

(58) a. Context: Joe is 5'9" tall and Bill is 5'8" tall.

  b. Joe is taller than Bill.

  c. #Joe is tall compared to Bill.

On one hand, the truth conditions of the comparative must allow for fine-grained distinctions to be made, given the acceptability of (58b) in the given crisp judgement context. On the other hand, the unacceptability of (58c) in such a context must also be accounted for, even though in non-crisp judgement contexts it is perfectly acceptable. The problem for the vague predicate analysis is that there must be a context for *tall* that is fine-grained enough in order for the comparative in (58b) to come out as true. However, it is then unclear why this should not be possible for (58c) in the exact same context. Specifically, it is unclear under Klein's analysis why (58b) should be acceptable in a crisp judgment context at all. The truth conditions in (57) require that Joe is considered tall, and Bill not tall, but this operation should not be possible, given the Similarity Constraint in (22). The analysis therefore predicts no distinction between explicit and implicit comparisons, and furthermore predicts that (58b) should actually be infelicitous in the given context.

Meanwhile, the degree analysis of scalar predicates can handle the contrast between (58b) and (58c) since under this account, the comparative form *taller* is not derived from a vague predicate; rather both the comparative form and the positive form are derived by adding degree morphology to an underlying element that contains a degree argument (cf. (45)). In the case of (58b), this underlying form combines with the comparative morpheme, resulting in a predicate that is true if Joe's height exceeds Bill's by any non-zero degree. By contrast, in the case of (58c), this underlying form combines with POS to yield a vague predicate, which is then subject to crisp judgment effects. Like von Stechow, Kennedy concludes that a decompositional analysis for gradable predicates in English is superior to the vague predicate analysis, since the former has a better handle on the facts

regarding vagueness and crisp judgment effects.[14]

Responding to Kennedy's challenge, van Rooij (2011) attempts to save the vague predicate analysis from its shortcomings with respect to handling explicit versus implicit comparison. For implicit comparisons like in (58c), the vague predicate *tall* is evaluated with respect to a context that includes only Joe and Bill. The crisp judgment effect arises due to the Similarity Constraint: Joe and Bill differ only slightly with respect to height, so we are unwilling to judge the proposition that Joe is tall true and the proposition that Bill is tall false. For explicit comparisons, van Rooij proposes a constraint on models that requires the existence of 'witnesses' to the compared objects that can be used to construct a comparison class that obviates the Similarity Constraint. However, such a move introduces abstract entities to the model that need not exist in the real world, which goes against one of the major criticisms of the degree analysis, namely that degrees are abstract ontological objects that introduce "unjustified complexity" into the semantic analysis. Thus, in order to explain the crisp judgment facts, the vague predicate analysis must introduce abstract ontological objects, essentially re-inventing degrees under a different guise.

I take these arguments to point in favor of the degree analysis over the vague predicate analysis for English, since the degree analysis does a better job of handling the full range of empirical facts. As for Klein's criticism that the use of degrees introduces unnecessary complexity into the semantic ontology, it turns out that this extra complexity is in fact warranted to get the empirical facts right for English (i.e., to capture the interpretation of differential measure phrases, and to handle crisp judgment effects). Klein's second criticism of the necessary recourse to the null POS morpheme in the interpretation of the positive form is perhaps still worrisome for the degree analysis. However, this worry can be quelled somewhat once we view POS as a member of a larger paradigm of degree morphemes alongside the comparative morpheme, degree modifiers, etc. Appealing to null morphology to complete a paradigm whose other members do have overt counterparts need

14. See Kennedy (2011) for more detailed critiques of several versions of the vague predicate analysis with respect to the interaction of vagueness and crisp judgment effects in the positive and comparative forms.

not raise red flags for conceptual adequacy, but rather can be viewed as an appropriate technical solution for a unified analysis of the paradigm.[15]

2.4   The composition of comparatives

In this section I review several issues in the composition of English comparative constructions. I first review the two major syntactic analyses of the syntax of adjective phrases and degree constructions. I then discuss the analysis of comparative constructions as quantificational structures, which leads into a discussion of the clausal versus phrasal distinction, namely whether the constituent selected by *than* is a CP or DP. The section ends with a brief discussion on the relative role of *-er* and *than* in deriving the semantics of comparative constructions. A running theme throughout this section is how varieties of syntactic or LF movements are involved in the composition of comparative constructions.

2.4.1   Two syntactic analyses for comparatives

There are two basic types of syntactic analyses for comparative constructions in English. I will refer to these as the AP analysis and the extended projection analysis. These analyses differ on the relationship between AP, the adjective phrase, and DegP, the degree phrase: under the AP analysis, DegP is the specifier of AP; under the extended projection analysis, AP is the complement of a Deg head. In this section, I review these theories, and how they derive the syntax and semantics of comparative constructions in English. While both types of analysis have relative merits and drawbacks, this overview will lead us to discuss several important topics in the composition of comparatives, specifically the phrasal versus clausal distinction, the semantic status of *than*, and overt and covert movement in the composition of comparatives.

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15. Also see Tonhauser (2011) for a similar line of reasoning in adjudicating between a null tense analysis versus a tenseless analysis of Paraguayan Guaraní. Tonhauser, however, uses this argument against a tensed analysis for Guaraní, which has no overt tenses.

The AP analysis of comparatives (and degree constructions more generally) was pioneered by Bresnan (1973), and has had many followers since (Bhatt & Pancheva, 2004; Heim, 1985, 2001; Hellan, 1981; von Stechow, 1984, among others). Under this analysis, a degree morpheme heads a degree phrase DegP, which is the specifier of an AP, as shown in (59):

(59)

```
            AP
          /    \
       DegP     A′
       /  \      |
     Deg   XP    A
```
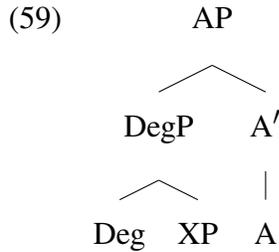
The degree-based semantics of gradable adjectives in (45) fits nicely into this picture, if we assume that DegP denotes a degree, which can saturate the degree argument of the gradable adjective. What is trickier, however, is how to get DegP to denote a degree in the first place. While it might be plausible to consider measure phrases as occupying DegP and denoting a degree, it is much less obvious for other degree morphemes that they denote degrees directly, as we will see below.

In the case of comparative constructions, the comparative morpheme *-er* is the Deg head, and its complement is the *than* phrase. Thus, the underlying phrase structure of *taller than Bill* is modeled as in (60), assuming that *than* heads a prepositional phrase.

(60)

```
                AP
             /      \
          DegP       A′
          /  \        |
        Deg   PP      A
         |    / \      |
        -er  P   DP   tall
             |   |
           than  Bill
```

60
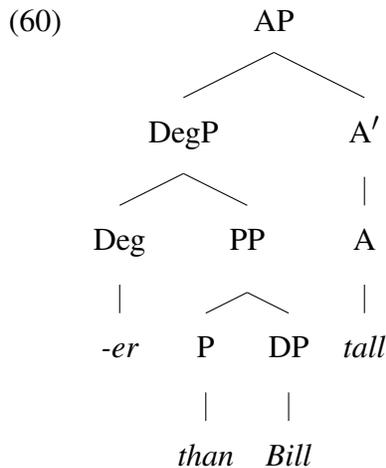
A virtue of this analysis is that it nicely captures the relation between *-er* and the *than* phrase (i.e., the fact that *-er* never selects an equative *as* phrase) as a selectional restriction between a head and its complement. Of course, this representation does not coincide with how this string is pronounced, and so to derive the correct surface word order, the *than* phrase must extrapose to the right of the adjective (Bresnan, 1973). However, this sort of movement is not motivated by anything other than to derive the correct surface word order.

The second style of syntactic analysis for degree constructions and comparatives treats DegP as the extended adjectival projection (Abney, 1987; Corver, 1990; Kennedy, 1997). Under this view, the gradable adjective (or rather, AP) is the complement of the degree head, as shown in (61):

(61)

```
          DegP
         /    \
      Deg′     XP
     /    \
   Deg    AP
```
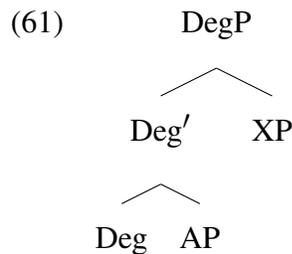
The semantics of degree morphemes of Kennedy & McNally (2005) discussed above fits well into this template for the most part. Under such an analysis, degree morphemes act as functions on gradable predicate meanings to return a property that can be predicated of an individual. The analysis of comparatives, however, will be somewhat more complicated than what was proposed in (47) and (48) in section 2.3.1. Specifically, under this analysis, the degree head *-er* and the *than* phrase do not form a constituent, as shown in (62).

(62)

```
             DegP
           /      \
        Deg′       PP
       /   \      /   \
     Deg   AP    P     DP
      |     |    |      |
     -er   tall than   Bill
```

61
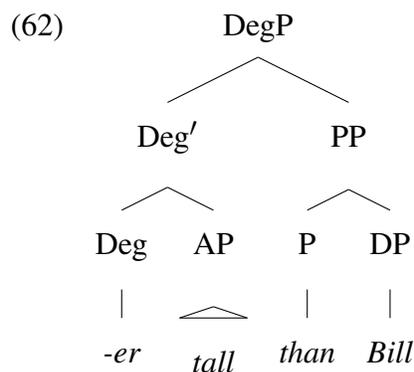
A welcome consequence of this view is that no extraposition of the than-phrase is necessary. It is generated in the correct position with respect to the surface word order.

The AP analysis and the extended projection analysis differ on the constituent structure they assign to the relevant morphosyntactic pieces making up the comparative construction. Under the AP analysis, the degree head and the *than* phrase form a constituent. As we have already seen, this captures the selectional restrictions on *-er* and other degree heads. Thus, *-er...than* and *as...as*, but not **-er...as* or **as...than*. Furthermore, many semantic analyses of comparatives treat the DegP (*-er + than* phrase) as a semantic constituent. Previewing some of the discussion in the next section, the DegP in a comparative is treated as a degree quantifier that can take scope (Cresswell, 1976; Heim, 1985, 2001; von Stechow, 1984). There is therefore apparently semantic evidence for the constituency of *-er* and the *than* phrase to the exclusion of the adjective. That the degree head *-er* and the *than* phrase can take scope together is problematic for the analysis in (62), since these elements do not form a constituent.

Of course, as we have already noted, the AP analysis does not correspond with the observed surface word order. To derive the correct word order, the *than* phrase must extrapose to the right of the adjective. This movement is obligatory, since strings where the movement does not take place are robustly ungrammatical: **Joe is more than Bill tall*. There is, however, no independent motivation for positing such movement other than to derive the correct surface word order. The extended projection analysis does not have this problem. The *than* phrase is generated to the right of the adjective, and no extraposition mechanism is necessary. Additionally, under the extended projection analysis, the morphological constituency between *-er* and the adjective comes for free, since the two elements are structurally adjacent.[16]

The debate over the correct analysis for English comparative constructions is yet to be re-

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16. Embick (2007) argues that forms like *taller* and *better* only require linear adjacency, and not necessarily structural adjacency. This means that if, under the AP analysis, the *than* phrase extraposes, leaving behind a trace, then *-er* and the adjective are linearly adjacent and can therefore merge to derive the correct surface forms.

solved; further comparisons between the two accounts may be found in Bhatt & Pancheva (2004) and Kennedy (1997). Since the focus of this dissertation is not on English comparatives, I will remain agnostic about the correct analysis for English. I submit that the relevant arguments for or against these approaches as they apply to comparatives in other languages should be made on a case-by-case basis on language-specific grounds. For concreteness, I will introduce the rest of the background concepts related to comparative constructions in this chapter in terms of the AP analysis.

2.4.2   Deriving (clausal) comparatives

2.4.2.1   The comparative morpheme as a degree quantifier

Turning now to the semantics of the comparative morpheme, the standard view is that the degree head *-er* is a quantifier over the degree variable introduced by the gradable adjective. That is, *-er* is of semantic type $\langle\langle d,t\rangle,\langle\langle d,t\rangle,t\rangle\rangle$ (Heim, 2001; von Stechow, 1984, among others). Thus, the comparative morpheme denotes a relation between two sets of degrees. Following Rullmann (1995) and others, I assume that the internal semantics of *-er* includes a maximality operator, defined in (64). The semantics of *-er* is then given in (63), where *-er* takes two sets of degrees as arguments, and compares the maximal degree of each set:[17]

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17. Two comments are in order here. First, Rullmann doesn't actually put the maximality operator in the semantics of *-er*: he assumes the maximality operator applies to the set of degrees denoted by the *than* phrase, and the resulting degree is the standard argument for *-er*. Second, while Rullmann argues that we need maximalization at least for the set of degrees denoted by *than* phrase, it is not clear whether the truth conditions for comparatives require that both sets of degrees be maximalized. An alternative to (63) could be stated as in (1):

(1) $[\![$ *-er* $]\!] = \lambda D1_{\langle d,t\rangle}\lambda D2_{\langle d,t\rangle}.\exists d \in D2[d \succ \max(D1)]$

A virtue of this version is that it contains an existential quantifier, making the degree quantifier analysis of *-er* more transparent. Going forward, however, I will simply assume the semantics in (63) for (clausal) comparatives.

(63)   *-er* as a degree quantifier:

$$[\![\textit{-er}]\!] = \lambda D1_{\langle d,t \rangle} \lambda D2_{\langle d,t \rangle}.\max(D2) \succ \max(D1)$$

(64)   Maximality operator over a set of degrees *D*:

$$\max(D) = \iota d[d \in D \wedge \forall d' \in D[d' \preceq d]]$$

Assuming the syntactic structure of the AP analysis, the adjective expects an argument of type *d* for the semantic composition. The composition of (65) would proceed as in (66). The DegP undergoes quantifier raising (QR; Heim & Kratzer, 1998), leaving behind a type *d* trace, and lambda-abstracting over its scope position, creating a predicate of degrees. I use the subscript *i* to represent identity between the QR-ed DegP and its trace. A partial derivation is given in (67).[18]

(65)   Joe is taller than Bill.

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18. I am ignoring world and time variables, and assume that the copula is vacuous. How the *than* phrase comes to denote a set of degrees is explained below in section 2.4.2.2.

(66)

$$TP_3 : \langle t \rangle$$

$$TP_2 : \langle d,t \rangle \qquad DegP_i : \langle \langle d,t \rangle, t \rangle$$

$$\lambda d \qquad TP_1 : \langle t \rangle \qquad Deg : \langle \langle d,t \rangle, \langle \langle d,t \rangle, t \rangle \rangle \qquad PP : \langle d,t \rangle$$

$$DP : \langle e \rangle \quad VP : \langle e,t \rangle \qquad \qquad \textit{-er} \qquad \textit{than Bill}$$

$$Joe \qquad V \quad AP : \langle e,t \rangle$$

$$is \quad d_i \quad A' : \langle d, \langle e,t \rangle \rangle$$

$$A$$

$$tall$$
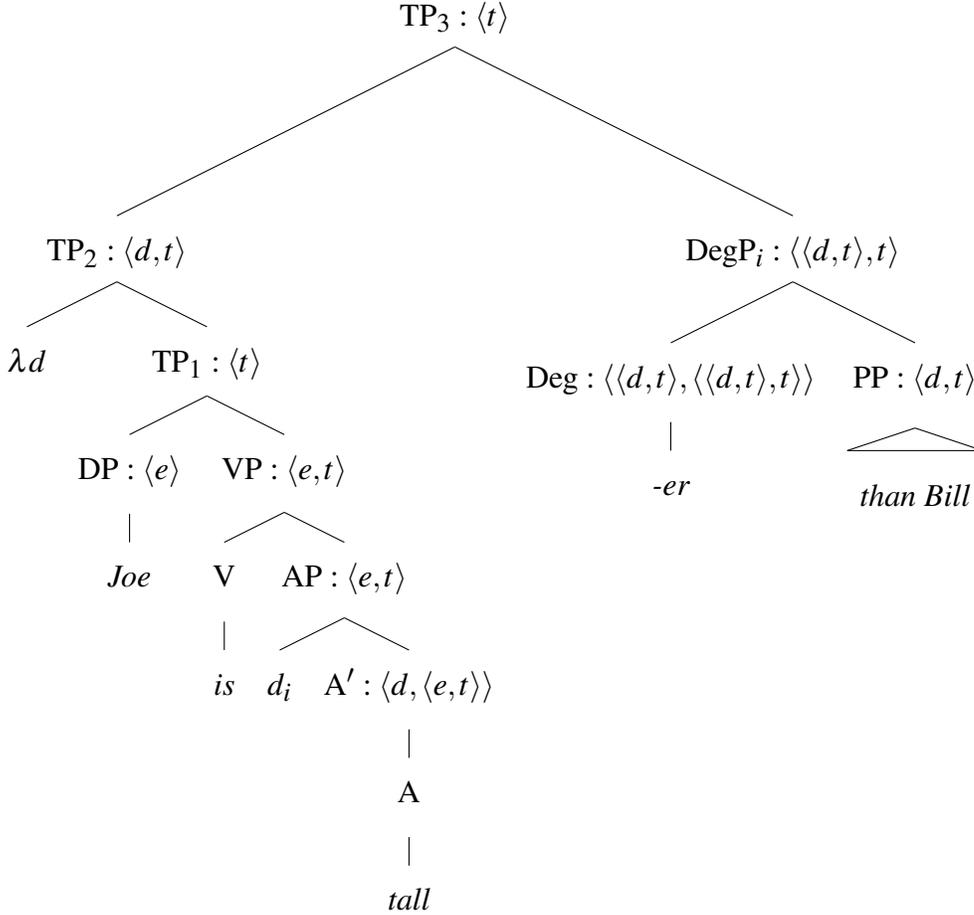
(67)   a. $[\![\, TP_2 \,]\!] = \lambda d.\mathbf{height}(j) \succeq d$

  b. $[\![\, PP \,]\!] = \lambda d'.\mathbf{height}(b) \succeq d'$

  c. $[\![\, DegP \,]\!] = [\![\, \textit{-er} \,]\!]([\![\, PP \,]\!]) = \lambda D2.\max(D2) \succ \max(\lambda d'.\mathbf{height}(b) \succeq d')$

  d. $[\![\, TP_3 \,]\!] = [\![\, DegP \,]\!]([\![\, TP_2 \,]\!]) = \max(\lambda d.\mathbf{height}(j) \succeq d) \succ \max(\lambda d'.\mathbf{height}(b) \succeq d')$

The composition works out nicely, with *-er* getting both of its arguments, and the movement operation is nothing special: it's just an instance of QR. In fact, there are good reasons to believe that the DegP is a scope-taking operator. As pointed out by Heim (2001), DegP can scopally interact with other operators (although the range of scopal interactions is rather limited, see Kennedy (1997) and Heim (2001) for more discussion). For instance, there is a scope ambiguity in (68), where DegP can scope below or above the intensional operator (the presence of the *exactly* differential is crucial; see Heim 2001):

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

    a. *required* > *-er*: required [[exactly 5 pages -er than that]$_i$ the paper be t$_i$-long]

      $\forall w \in \text{Acc: } \max(\lambda d.\textbf{length}_w(p) \succeq d) = 15$ pages

      (where Acc = the set of accessible worlds)

    b. *-er* > *required*: [exactly 5 pages -er than that]$_i$ [required [the paper be t$_i$-long]]

      $\max(\lambda d.\forall w \in \text{Acc: } \textbf{length}_w(p) \succeq d) = 15$ pages

Under the first reading, the paper is exactly 15 pages long in all worlds made accessible by *required*. Under the second reading, the paper is exactly 15 pages long in all accessible worlds where it is shortest (i.e., the paper is at least 15 pages long in those worlds). The existence of such an ambiguity is predicted if DegP is allowed to QR to take scope.

2.4.2.2 Clausal standards as wh-structures

A complication yet to be addressed is how the standard phrase *than Bill* in (66) comes to denote a set of degrees in the first place. A common view is that the preposition *than* does not in fact take a DP as its complement, but rather a CP that can be targeted by ellipsis (Bresnan, 1973; Chomsky, 1977; Heim, 1985; Lechner, 2001, among others). That the *than* phrase should in fact contain a full clause underlyingly is evidenced by the fact that in many cases such clausal material is overt. For instance, the comparative in (65) can also be paraphrased as in (69). Under the clausal analysis, the adjective *tall* is also present in the *than* clause, but is elided. The existence of comparatives like (70) also supports a clausal analysis.

(69) Joe is taller than [$_{CP}$ Bill is ~~tall~~].

(70) The table is wider than [$_{CP}$ it is long].

    Chomsky (1977) proposes that the *than* clause essentially behaves like a special case of a relative clause. It contains a null wh-operator that moves to the specifier of position of the CP selected by *than*. Evidence for this view comes from the observation that *than* clauses display

66

island sensitivities typical of wh-structures. For instance, as shown in (71)-(72), when the proposed movement would involve an island violation, in this case a wh-island, the result is ungrammatical.

(71)   a. Mary isn't taller than she was five years ago.

        b. *Mary isn't taller than I wonder whether she was five years ago.

(72)   a. Mary isn't taller than [Op_i she was t_i five years ago].

        b. *Mary isn't taller than [Op_i I wonder [whether she was t_i five years ago]].

Further evidence for this view comes from the fact that there are languages where an overt wh-element is present in the complement of the standard marker (see e.g. Merchant 2009 for Greek and Pancheva 2006, 2009 for Slavic).

On the semantic side, the degree operator is not interpreted (following Heim & Kratzer, 1998, for the interpretation of relative clauses), but the movement results in the creation of degree trace that is bound by a lambda operator. As shown in (73), the CP selected by *than* in the sentence (69) is interpreted as a predicate of degrees. We thus arrive at the interpretation of the *than* constituent that was needed in (67b) for the first argument of *-er* (assuming that *than* is semantically vacuous; see 2.4.4 for some discussion on this point).

(73)   a. than [$_{CP}$ Op_i Bill is d_i-tall].

        b. ⟦ Op_i Bill is d_i-tall ⟧ $= \lambda d.\mathbf{height}(b) \succeq d$

In sum, under this analysis, the complement of *than* is a CP, which denotes a set of degrees. Parts of the clause may undergo ellipsis (which is in some cases obligatory) to give the appearance on the surface that *than* sometimes selects a DP.[19]

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19. For more details on the nature of the ellipsis operations at work, see Kennedy (1997); Lechner (2001); Merchant (2009).

2.4.3   Clausal vs. phrasal standards

2.4.3.1   Arguments for phrasal standards

Whereas certain authors assume that all English comparatives have an underlying clausal structure in the *than* constituent (e.g. Bhatt & Takahashi, 2011; Lechner, 2001), others maintain that in some cases the constituent selected by *than* is still a DP (Hankamer, 1973; Heim, 1985; Kennedy, 1997). Such a view leads to a two-way distinction in the nature of the *than* constituent: cases where *than* selects a CP complement; and cases where *than* selects a DP complement. This distinction is known in the literature as the clausal versus phrasal distinction.

A first piece of evidence in favor of the existence of purely phrasal standards from the fact that unlike the comparative in (74), in certain cases a clausal expansion of the standard phrase is not possible, as in (75).

(74)   Joe is taller than Bill (is).

(75)   Joe is taller than 5 feet (*is).

A second piece of evidence comes from reflexive binding. As shown in (76), a reflexive pronoun complement of *than* can be bound by the subject. Such comparatives also cannot be expanded into a clause. This behavior can be explained in terms of Condition A of Binding Theory (Chomsky, 1981). If the complement of *than* is a DP in this case, then the reflexive is bound in its minimal governing category. By contrast, if *than* selects a CP complement in this case, the result should be ungrammatical since the reflexive would not be bound in its minimal governing category, violating Condition A.

(76)   a.   No star is brighter than itself (*is).

      b. $[_{TP}$ no star$_j$ is brighter $[_{PP}$ than $[_{DP}$ itself$_j$ $]]]$

Facts such as these lead to the conclusion that at least some comparatives are inherently phrasal rather than derived from clausal sources. This means that we will need an alternative semantics for

-er than the one developed in section 2.4.2 in order to handle these cases.

2.4.3.2   The direct analysis for phrasal comparatives

The standard way of deriving the semantics of phrasal comparatives is to invoke the so-called 'direct' analysis (Bhatt & Takahashi, 2007, 2011; Heim, 1985; Kennedy, 1997; Merchant, 2009). The analysis is direct in the sense that rather than mapping the target and standard of comparison to two sets of degrees which are then compared, the two individuals being compared are themselves arguments of the comparative morpheme on this view. A semantics for the version of *-er* that occurs in phrasal comparatives can thus be stated as in (77).

(77)   *-er* for phrasal comparatives:

$$[\![\,\textit{-er}\,]\!] = \lambda x_{\langle e \rangle} \lambda G_{\langle d, \langle e, t \rangle \rangle} \lambda y_{\langle e \rangle}.\max(\lambda d.G(d)(y)) \succ \max\,(\lambda d'.G(d')(x))$$

Assuming the AP syntax for comparatives as above, *-er* first combines with the standard of comparison, which in phrasal comparatives is an individual-denoting PP. The result of this composition then combines with the gradable adjective, then finally the target of comparison to arrive at a truth value. The composition of the sentence *Joe is taller than Bill*, this time re-cast as a phrasal comparative, would proceed as in (78). A semantic derivation in given in (79).

(78)

```
                        TP : ⟨t⟩
                       /        \
              DP : ⟨e⟩          VP : ⟨e,t⟩
                 |             /         \
               Joe           V            AP : ⟨e,t⟩
                             |           /          \
                            is    DegP : ⟨⟨d,⟨e,t⟩⟩,⟨e,t⟩⟩    A′ : ⟨d,⟨e,t⟩⟩
                                  /            \                    |
         Deg : ⟨e,⟨⟨d,⟨e,t⟩⟩,⟨e,t⟩⟩⟩      PP : ⟨e⟩                 A
                      |                    /     \                   |
                     -er                  P    DP : ⟨e⟩            tall
                                          |      |
                                         than   Bill
```
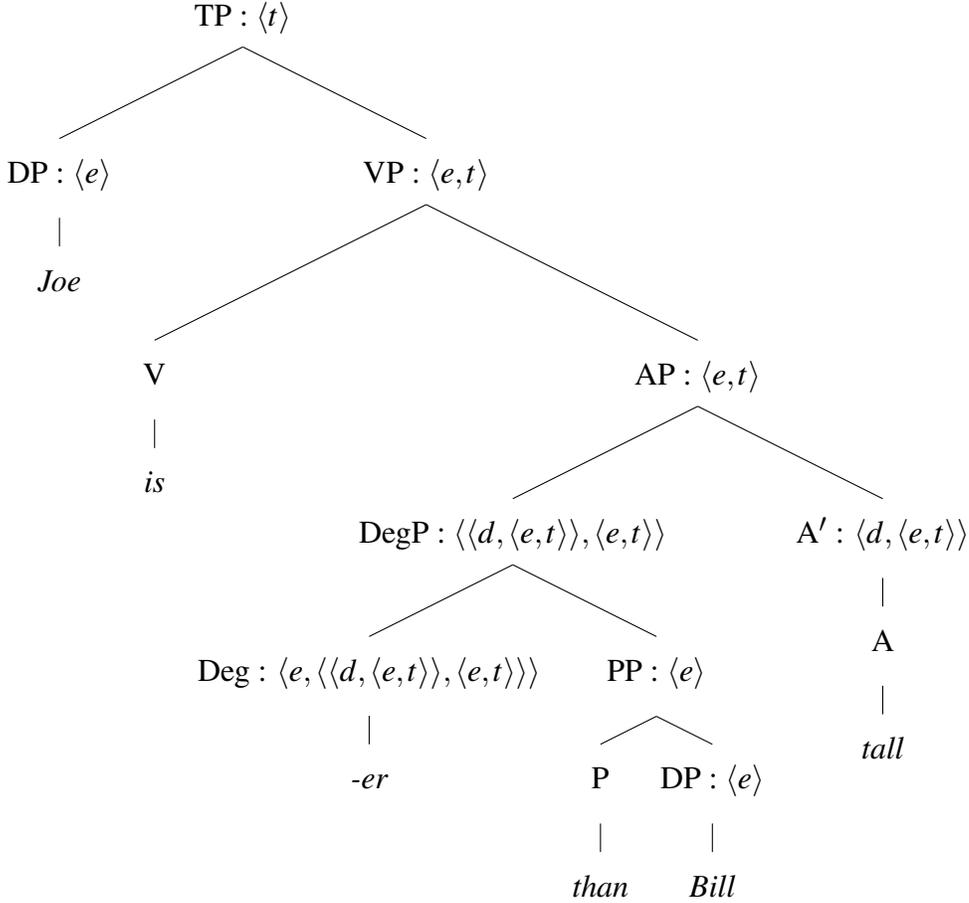
(79) a. $\llbracket \text{DegP} \rrbracket = \llbracket \text{Deg} \rrbracket(\llbracket \text{PP} \rrbracket) = \lambda G_{\langle d,\langle e,t\rangle\rangle}\lambda y_{\langle e\rangle}.\max(\lambda d.G(d)(y)) \succ \max(\lambda d'.G(d')(b))$

   b. $\llbracket \text{VP} \rrbracket = \llbracket \text{AP} \rrbracket = \llbracket \text{DegP} \rrbracket(\llbracket \text{AP} \rrbracket) = \lambda y_{\langle e\rangle}.\max(\lambda d.\mathbf{height}(y) \succeq d) \succ \max(\lambda d'.\mathbf{height}(b) \succeq d')$

   c. $\llbracket \text{TP} \rrbracket = \llbracket \text{VP} \rrbracket(\llbracket \text{DP} \rrbracket) = \max(\lambda d.\mathbf{height}(j) \succeq d) \succ \max(\lambda d'.\mathbf{height}(b) \succeq d')$

We arrive at same truth conditions for the sentence as we did under the clausal analysis (compare (67d) and (79c)). The composition of the sentence-level meaning, however, is quite difference under the two analyses.

There is no requirement for the DegP to take scope under this analysis.[20] The comparative morpheme receives all of its arguments by remaining in-situ. However, it has been argued that the DegP in phrasal comparatives *can* QR, just like in clausal comparatives (Bhatt & Takahashi,

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20. Note, however, that the DegP acts as a functor on A′ in (78).

2007, 2011; Merchant, 2009). Evidence comes from cases where the target of comparison is not the subject of the sentence, like in (80).

(80)   More people read *Game of Thrones* than *The Hunger Games*.

In the languages analyzed by Bhatt & Takahashi (2007, 2011) and Merchant (2009) (Hindi and Greek, respectively), there is more evidence that a direct analysis is necessary for sentences like (80), rather than a clausal one.[21] But this means that the comparative morpheme doesn't get the correct order of arguments, since it is the object of the transitive verb that acts as the target of comparison and thus needs to combine as the third argument of *-er* per (77).

Examples of this sort in Luganda will be discussed in chapter 4, where I show in more detail what exactly goes wrong in these cases without movement of the comparative morpheme. For the time being, to keep things simpler, I will continue using our sentence *Joe is taller than Bill* to show how this type of movement works in the first place. The analysis involves a variant of QR that was developed by Nissenbaum (2000) for the interpretation of parasitic gaps, and has been exploited by Barker (2007) and Kennedy & Stanley (2009) for the interpretation of *same* and *average*, respectively. Bhatt & Takahashi (2007, 2011) and Merchant (2009) apply it to phrasal comparatives in Hindi and Greek. First, the target of comparison moves to create a new node at LF that marks the scope of the raised DP, and leaving a trace in its original position. Next, the DegP moves to an intermediate position between the target of comparison and its scope target, leaving behind a trace of type *d*. That is, the movement of DegP is parasitic on the movement of the target: the DegP needs the new scope-taking site for its movement to occur in the first place. The composition of *Joe is taller than Bill* would proceed as in (81):

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21. Merchant also entertains a reduced clausal analysis for Greek phrasal *apo* comparatives, and does not ultimately decide between the two analyses.

(81)

TP$_5$: $\langle t \rangle$
- DP$_j$: $\langle e \rangle$
  - | *Joe*
- TP$_4$: $\langle e,t \rangle$
  - DegP$_i$: $\langle \langle d, \langle e,t \rangle \rangle, \langle e,t \rangle \rangle$
    - *-er than Bill*
  - TP$_3$: $\langle d, \langle e,t \rangle \rangle$
    - λd
    - TP$_2$: $\langle e,t \rangle$
      - λx
      - TP$_1$: $\langle t \rangle$
        - t_j
        - VP : $\langle e,t \rangle$
          - V
            - | *is*
          - AP : $\langle e,t \rangle$
            - d_i
            - A$'$: $\langle d, \langle e,t \rangle \rangle$
              - | A
                - | *tall*
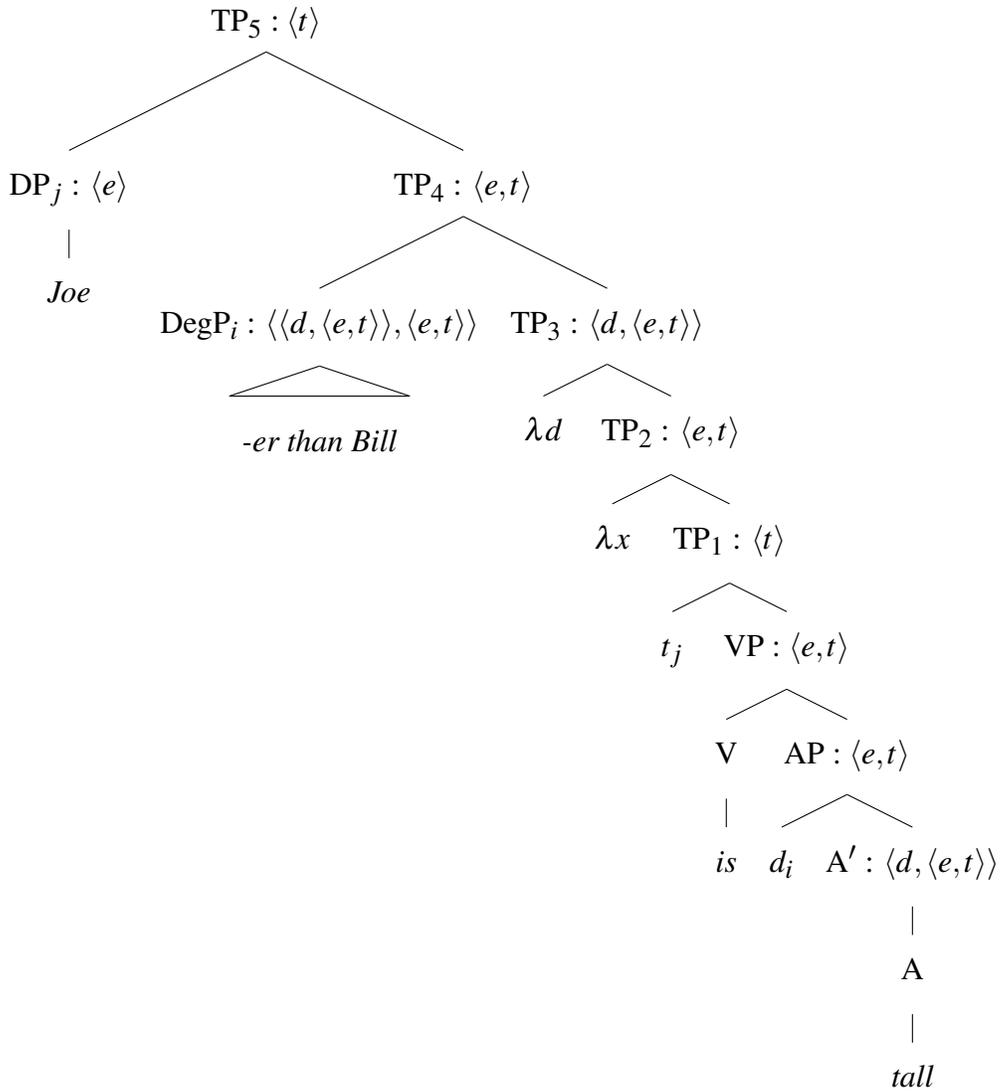
Thus, even on the direct analysis of phrasal comparatives, the DegP can still QR to take scope, although this movement is dependent on the movement of the target of comparison as well.[22] In cases like (81), this has no truth conditional reflex compared with (78). However, as we will see in chapter 4, this operation can be exploited to account for certain ambiguities observed in Luganda exceed comparatives.

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22. There are versions of the direct analysis that do not allow for this possibility; these will be discussed in section 2.5.

2.4.4   The contribution of standard markers

Before concluding this section, I briefly make some remarks on the relative role of the comparative morpheme and the standard marker in comparative constructions. For English comparatives, it is standard to assume that *than* is semantically vacuous. All the comparative semantics is located in *-er* only. This view is also commonly extended to the analysis of comparatives in other languages as well, even in cases where there is no overt counterpart of *-er*. Many authors simply assume a null counterpart of *-er*, while overt standard marking is also taken to be vacuous. See, for example, Beck et al. (2004); Bhatt & Takahashi (2011), for such a view of Japanese; and Bhatt & Takahashi (2011) for Hindi.

There are two recent analyses that place a larger semantic burden on standard markers. First, Schwarzschild (2012a) begins with the observation that many languages make use of the locative comparison strategy, whereby the standard marker in these languages is also used as a locative, allative, or spatial adposition in non-comparative contexts. He capitalizes on this fact and extends the vectors space analysis of prepositional phrases in English (Zwarts, 1997; Zwarts & Winter, 2000) to locative comparative constructions in Hindi and Navajo. Under this analysis, the standard marker provides the differential semantics necessary for the comparative construction. The standard PP in the comparative construction comes to denote a set of vectors along some dimension whose start point is the maximal value of the standard DP on the relevant dimension (cf. Faller, 2000; Winter, 2005). The semantic contribution of the standard marker is crucial for this analysis, since Schwarzschild does not posit a null comparative morpheme for Hindi comparatives like Bhatt & Takahashi (2007, 2011).

Second, Alrenga et al. (2012) likewise propose that standard markers play an important semantic role in comparatives, even for languages like English where we also find overt comparative morphology. In fact, they assign meanings for clausal and phrasal *than* that are almost identical to the clausal and phrasal comparative morphemes in (63) and (77), respectively. Their motivation for positing such a semantics for the standard morpheme stems in part from some of the scopal

behaviors of *than* phrases that were introduced in section 2.4.2, along with some other general-izations about comparative constructions in English. They also claim that their analysis can be extended to languages that lack overt comparative morphology (which seem to form the majority of the world's languages; Bobaljik 2012; Stassen 1985; Ultan 1972), whereby all the semantic action should presumably be located in the standard markers.

To summarize, while standard marking is typically taken to be vacuous, a recent line of research has begun to question this view and consider more seriously the possible semantic contributions of standard markers. This seems to be a promising avenue of further research, given the typological fact that many languages have overt standard morphology without overt comparative morphology.

2.5   Cross-linguistic variation

A recent line of research has emerged that has begun to explore the syntax and semantics of com-paratives in languages other than English and German. In large part, such studies apply the basics of the analyses presented here, or slight variations thereof, to analyze comparative constructions on other languages. A non-exhaustive list includes Merchant (2009, 2012) for Greek; Bhatt & Takahashi (2007, 2011), Schwarzschild (2012a) for Hindi; Beck et al. (2004), Bhatt & Taka-hashi (2011), Sawada (2008a), Shimoyama (2012) for Japanese; Erlewine (2007), Lin (2009), Xiang (2005) for Mandarin Chinese; Bogal-Allbritten (2008, 2013) for Navajo; Bunting (2011) for Sranan; Pancheva (2006, 2009) for several Slavic languages; Eckardt (2009) for Udmurt; and Howell (2013), Vanderelst (2010) for Yorùbá. In this section, I focus on two studies, Beck et al. (2009) and Lin (2009) , that specifically seek to explain certain cross-linguistic patterns by positing parameters of variation along which languages may vary systematically.

Beck et al. (2009) perform a medium-depth survey of comparatives and other degree construc-tions in 14 geographically and typologically diverse languages. They find certain implicational clusterings in the data, which hold more or less consistently across the 14 languages of their study (for example, if a language has degree questions, then comparatives in that language also show

scope interactions with modal verbs). They propose the following three parameters to explain cross-linguistic variation found in these constructions:

(82) Degree Semantics Parameter (DSP):

A language {does/does not} have gradable predicates (type $\langle d, \langle e, t \rangle \rangle$ and related), i.e., lexical items that introduce degree arguments

(83) Degree Abstraction Parameter (DAP):

A language {does/does not} have binding of degree variables in syntax

(84) Degree Phrase Parameter (DegPP):

The degree argument position of a gradable predicate {may/may not} be overtly filled

The first parameter, DSP, governs variation in the lexicalization of gradable predicates across languages. Beck et al. propose that there may be languages where gradable predicates do not introduce degree variables. They suggest that 13 languages of their study, including English, have a positive setting of this parameter, while a single language in their study, Motu, has a negative setting. Motu uses the conjoined comparison strategy, and does not have any overt comparative or standard-marking morphology, and lacks other degree constructions as well, such as measure phrases. Beck et al. leave open the possibility that there could be other means through which degree variables could be introduced in such languages. This parameter and its implications have not yet been investigated for other languages, though it will be explicitly pursued for the analysis of Washo in chapter 6 (following Bochnak, 2013).

The second parameter, DAP, governs whether degree operators can take scope in a language, and whether degree predicates can be derived at LF. English would have a positive setting of this parameter. Beck et al. claim that Mandarin, Japanese, and Yorùbá are languages in their sample that display the negative setting of this parameter. Comparatives in these languages apparently lack scope interactions with modal verbs, degree questions, and so-called negative island effects (Rullmann, 1995). The classification of certain languages as having a negative setting of this parameter has recently been challenged, casting doubt on whether the DAP is the best way to capture

the cross-linguisitic variation that Beck et al. want to account for. Specifically, Kennedy (2007a) proposes that the lack of negative island effects in Japanese can be accounted for by positing a distinction between degree and individual comparison, while Shimoyama (2012) shows that Japanese does have degree abstraction in clausal comparatives, which display island effects similar to those in English. Howell (2013) also argues that Yorùbá does have degree abstraction at LF, and therefore should not be considered a -DAP language. She also shows that the specific facts regarding degree abstraction in Yorùbá are different from those in Japanese, indicating that something more fine-grained than the DAP must be at work.

Finally, the third parameter, DegPP, governs whether the specifier of AP (= DegP, assuming the AP syntax in (59)), can be filled overtly or not. They propose that English has a positive setting of this parameter, while languages like Russian and Turkish have a negative setting. Beck et al. show that languages with a negative setting of this parameter lack degree questions and measure phrases, which by hypothesis overtly fill the DegP position. To my knowledge, this parameter has not been challenged in the literature. However, note that this parameter depends on accepting a large number of theoretical assumptions about the syntax of AP and DegP that are as of yet unresolved in the literature (see discussion in section 2.4.1). Additionally, this parameter is the least semantic of these parameters, where the explanation of the cross-linguistic variation appears to rest on a syntactic or morphophonological constraint in the languages that have a negative setting of DegPP (Beck et al. do not actually spell out in detail whether they view this parameter as more syntactic or morphophonological in nature).

Lin (2009) offers a slightly different proposal for parametric variation in comparatives based on a study of phrasal comparatives in Mandarin Chinese. He offers the following parameters of cross-linguistic variation:

(85) Parameters proposed by Lin (2009)

    a. If a language does not have clausal comparatives, it does not have degree comparison, i.e., it does not have the binding of degree variables in the syntax

b. Comparatives in a language can be argument-dependent or non-argument dependent

c. If a language has phrasal comparatives, the construction may allow comparison of one phrase (monadic comparison) or more than one phrase (dyadic comparison)

The first parameter is similar to Beck et al.'s Degree Abstraction Parameter, which, as we have just acknowledged, is problematic.

The second parameter is intended to govern the sorts of things that can be compared in a comparative construction. It follows up on Kennedy's (2007a) proposal that Japanese has only comparisons of individuals, but not degrees. Lin shows that in Mandarin, times, locations, and propositions can also be compared, in addition to individuals. He classifies Mandarin as an argument-dependent language by claiming that all these elements are arguments of the predicates that serve as the basis of comparison. It is therefore unclear under this view as what counts as a non-argument-dependent language. Another curious property of this parameter is that Lin shows that Mandarin does not have degree comparison. This is curious, since Lin also assumes that degree are arguments of gradable predicates, but these cannot be compared. It seems, therefore, that the lack of degree comparatives in this language cannot be handled by this parameter, and still needs to be stipulated.

Finally, the third parameter governs a property of phrasal comparatives, namely whether they can involve single standards of comparison, or several. Typically, the existence of multiple standards like in (86) is taken to indicate an underlying clausal structure (Bhatt & Takahashi, 2011; Lechner, 2001).

(86)   Joe read more books today than Bill yesterday.

Lin shows that Mandarin has comparatives like (86), but argues that these are comparing multiple phrases and do not involve ellipsis from a clausal source. Lin therefore proposes that languages with phrasal comparatives may vary with respect to how many standards are possible. To my knowledge, Mandarin is the only language for which this has been proposed.

After presenting and analyzing the data for Luganda and Washo in this dissertation, we will revisit and re-evaluate these parameters in view of the new data.

Before concluding, I briefly mention another parameter of variation that has recently been proposed in the literature. This parameter involves the order of arguments for the phrasal comparative morpheme. Beck et al. (2012) and Merchant (2012) independently come to the conclusion that it matters for movement possibilities whether the comparative operator combines first with the standard argument or the gradable adjective. Unfortunately, these authors do not agree on which argument structure is the one that prevents movement in phrasal comparatives. Clearly, there is more work that needs to be done to investigate the implications of order of application of arguments on the interpretation of comparatives, but I do not pursue this line of inquiry further here.

2.6 A look ahead

We have now reviewed the basic notions that will serve as the background for the analyses of Luganda and Washo that are proposed in later chapters. In particular, the following distinctions, points of variation, and general properties of comparatives will come to play important roles in the analyses of these languages:

- explicit versus implicit comparison

- clausal versus phrasal comparatives

- movement and scope-taking properties of comparatives

- whether gradable predicates introduce degree variables

The data from Luganda and Washo provide an ideal testing ground for these parameters, since these languages make use of comparative constructions that are typologically quite common, but remain understudied from a formal semantic perspective.

Chapter 3

EXCEED AND CLEFT COMPARISONS IN LUGANDA

3.1 Introduction

In this chapter I outline some of the basic features of two types of comparative constructions available in Luganda: exceed comparison, and a cleft construction. EXCEED COMPARISON is characterized by the use of a transitive verb whose lexical meaning in 'to exceed' or 'to surpass', and whose direct object is the standard of comparison (Stassen, 1985). Within this class, Stassen distinguishes three sub-types, of which Luganda makes use of two. Specifically, in Luganda the exceed verb may appear as the main predicate of a comparative sentence, or in a subordinate, nominalized form. The third type of 'exceed' comparison in Stassen's typology, a serial verb construction, is not attested in Luganda. Meanwhile, in cleft comparisons, the target of comparison appears as the subject of a cleft construction, with the standard of comparison left implicit. Examples of these three constructions are given in (87)-(89). The basic morphosyntactic and semantic properties of these constructions will be at issue in this chapter.

(87)   *Kizito **asinga**   Kato obukulu.*
   Kizito a-singa   Kato o-bu-kulu
   Kizito NC1-exceed Kato AUG-NC14-old
   'Kizito is older than Kato.'

   lit.: 'Kizito exceeds Kato in oldness.'   MAIN VERB EXCEED

(88)   *Kizito mukulu **okusinga**   Kato.*
   Kizito mu-kulu o-ku-singa   Kato
   Kizito NC1-old AUG-NC15-exceed Kato
   'Kizito is older than Kato.'

   lit.: 'Kizito is old exceeding Kato.'   SUBORDINATE EXCEED

(89)   *Kizito **ye**   mukulu.*
   Kizito a-e   mu-kulu
   Kizito NC1-CLEFT NC1-old

'Kizito is older (than other people/things in a context).'

lit.: 'Kizito is the one who is old.' CLEFT

This chapter is organized as follows. In section 3.2 I outline some basic facts about Luganda morphosyntax that will become relevant in subsequent discussion. In particular, there will be extensive discussion on distinguishing the syntactic categories of adjective, verb, and noun in this language. I then move on to describe the exceed comparison constructions and the cleft comparison construction in more detail in section 3.3. In section 3.4 consider the diagnostics of Kennedy (2007a) with respect to explicit versus implicit comparison, and show that both versions of exceed comparisons pattern like explicit comparison, while the cleft comparison patterns like implicit comparison. I give an analysis of cleft comparisons as implicit comparisons at this point. Then in section 3.5 I turn to the phrasal vs. clausal distinction, and argue that Luganda exceed comparisons have only phrasal standards. Section 3.6 lays out a preliminary semantics for gradable predicates and exceed comparatives, based on the properties of exceed comparatives outlined in this chapter. Section 3.7 concludes.

Before going into the main body of the chapter, let me first defend why we should consider these constructions to be expressing comparison. The exceed constructions in (87) and (88) correspond to what Stassen (1985) terms as *primary comparison* for this language. These are the constructions that are most often offered as translations of English *-er/more* comparatives.[1] The cleft construction in (89), meanwhile, is a secondary means for making comparisons. While this construction does not make use of any special comparative morphology beyond the regular syntax for cleft constructions, there is reason to include sentences like (89) in this study of comparison constructions. First, Ashton et al. (1954) describe the cleft in Luganda as being able to convey "comparison and contrast" (pp 442-4).[2] Two of their examples are given below, with their original English translations:

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1. I do not have a good sense as to which exceed construction is more frequent or preferred between the two.

2. They also recognize the verb *-singa* as expressing comparison as well.

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(90) *Omuggo   guno   gwe   muwanvu.*
 o-mu-ggo   gu-no   gu-e   mu-wanvu
 AUG-NC3-stick NC3-PROX NC3-CLEFT NC3-long
 '*This* stick is the long one (i.e. this is the longer or longest stick).'

(Ashton et al., 1954, p.443; my morpheme parse)

(91) *Muno   mwe   mulungi.*
 mu-no   mu-e   mu-lungi
 NC18-PROX NC18-CLEFT NC18-nice
 'In *here* is pleasant (i.e. pleasanter than . . .).'

(Ashton et al., 1954, p.443; my morpheme parse)

Second, such constructions were sometimes volunteered by Kisuule Magala Katende during elicitation sessions, indicating that present-day speakers do have intuitions about this use of the cleft to convey a comparative meaning. Going forward, I therefore take cleft constructions like (89) to be a construction that can be used to make comparisons in Luganda, and include this construction in the present study.

3.2 Introduction to Luganda morphosyntax

In this section I lay out certain facts about Luganda grammar that will be helpful for understanding certain morphosyntactic properties of the data I will present from this language. Specifically, I describe the noun class and agreement system, and the ways we can identify the categories of adjectives, verbs, and nouns.

3.2.1 Noun class and agreement

All nouns in Luganda belong to one of 21 noun classes, and each nominal root must be accompanied by a C/CV/∅ prefix that identifies noun class membership. Some noun classes correspond to certain semantic features (e.g. class 1 is reserved for the singular human class), but in many cases class membership is completely arbitrary. Noun class numbering corresponds to the reconstructed

Proto-Bantu noun class system (see Katamba, 2003). The noun stem including class prefix may also be prefixed by a vowel, typically referred to as the *augment* by Bantuists (also sometimes called a *pre-prefix* or *initial vowel* in the literature). The phonological shape of the augment vowel depends on the phonological shape of the following noun class marker. The augment is *a-* preceding a noun class marker containing /a/, *o-* preceding a noun class marker containing /u/, and *e-* otherwise (i.e., when the noun class marker contains /i/, contains no vowel, or is null). Noun stems with these prefixes are shown in (92):

(92) a. *omuntu*
o-mu-ntu
AUG-NC1-person
'(the/a) person'

b. *ekitabo*
e-ki-tabo
AUG-NC7-book
'(the/a) book'

Many authors have attempted to generalize a semantics for the Bantu augment based on notions such as definiteness, specificity, and referentiality, but a unified analysis of its functions remains elusive (see Katamba 2003 and Adams 2010 for discussion). More recently, Halpert (2012) argues that in some cases, the Bantu augment is a case marker that intrinsically licenses a nominal that would otherwise not receive structural case.

Nouns trigger agreement on other categories in the language, based on noun class.[3] The shape of the agreement marker can vary for one and the same noun class, depending on the syntactic category of the element where the agreement morphology appears, or in the case of agreement on verbs, whether the noun is the subject or object. Only subjects are required to trigger agreement on finite verbs. Objects only trigger agreement on the verb if the overt object is not present or

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3. I refer to the relevant morphemes as agreement, following Katamba (2003) and Ssekiryango (2006). However, the status of these morphemes as agreement or incorporated pronominal arguments in Bantu is a matter of some debate (see e.g. Bresnan & Mchombo, 1987).

has moved outside of the VP (Ssekiryango, 2006). The following example illustrates subject and object agreement on the finite verb *-wa* 'give', where the direct object pronoun refers to *ekitabo* 'the book' (class 7) and the indirect object is a third person human (class 1):[4,5]

(93) *Kato akimuwa.*
      Kato a-ki-mu-wa
      Kato NC1SUBJ-NC7OBJ-NC1OBJ-give
      'Kato is giving it (the book) to him.'

The rich agreement system allows third person arguments to be regularly omitted if they are recoverable from context. The sentence in (93) without the overt subject *Kato* is grammatical if Kato (or some other noun belonging to class 1) is understood to be the subject of this sentence.

Noun class prefixes also appear to have derivational functions in Luganda and across Bantu (Mufwene, 1980). Common derivational processes associated with noun class include making pejoratives or diminutives, as in (94):

(94) *omwana* 'child' (class 1) → *ogwana* 'bad child/little bastard' (class 20)

One particular derivational process that will be of importance to us here are the nominalizations of adjectives and verbs, which appear with the noun class prefixes *bu-* and *ku-*, respectively. The prefix *bu-* occurs with nominalized adjective stems, which belong to class 14, as shown in (95). Meanwhile, *ku-* occurs with nominalized verb stems, which belong to class 15, as shown in (96). The nominalized forms of verbs are usually translated as the infinitive form of the verb.[6] For the

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4. Proper names and (singular) kinship terms form part of the class 1a, which trigger noun class 1 agreement, but have no noun class prefix or augmented forms. I omit null noun class prefixes for nouns in class 1a.

5. Strictly speaking, the stem in (93) is just w-, where the final *-a* is a separate morpheme referred to by Bantuists as the *final vowel*. The function of this morpheme is typically analyzed as being related to aspect (e.g. Ashton et al., 1954). Going forward, I will usually include the final vowel as part of the verb stem so as not to over-complicate the glossing, except for cases where a verbal extension appears between the stem and the final vowel (e.g. passive or applicative morphemes).

6. As we will see in section 3.3.1, *ku-* in fact marks nominalized verb phrases.

present purposes, we can assume that a null nominalization morpheme is responsible for creating class 14 or class 15 nouns from adjectives and verbs, respectively, with the class prefixes overtly marking class membership, though nothing hinges on this particular analysis.

(95) a. *-wanvu* 'tall' → *bu-wanvu* 'tallness'

  b. *-kulu* 'old' → *bu-kulu* 'oldness'

  c. *-zito* 'heavy' → *bu-zito* 'heaviness'   ADJECTIVES

(96) a. *-soma* 'read' → *ku-soma* 'to read'

  b. *-gwa* 'fall' → *ku-gwa* 'to fall'

  c. *-nyogoga* 'cold' → *ku-nyogoga* 'to be cold'   VERBS

I defend the claim that these prefixes serve as nominalizers based on the following evidence. First, the resulting forms can appear in argument position, and trigger subject agreement on predicates based on the noun class inherited from the nominalizing prefix (class 14 for adjective nominailzations, class 15 for verb nominalizations). Second, these forms take the augment in positions where other nouns appear with the augment. See (97) and (98):

(97) *Obunafu*   *bubi.*
      o-bu-nafu   bu-bi
      AUG-NC14-lazy NC14-bi
      'Laziness is bad.'

(98) *Okutunga*   *kwangu.*
      o-ku-tunga   ku-angu
      AUG-NC15-sew NC15-easy
      'Sewing is easy.'

3.2.2 *Distinguishing syntactic categories*

Gradable properties that are lexicalized as adjectives in English can be lexicalized as adjectives, nouns, or verbs in Luganda. In (99), *muzito* 'heavy' is an adjective; in (100), *gunyogoga* 'cold' is a verb; and in (101) *mazima* ≈ 'honest' ('truth') is a noun.

(99) *Kizito muzito.*
Kizito mu-zito
Kizito NC1-heavy

'Kizito is heavy.'   ADJECTIVE

(100) *Omwenge   gunyogoga.*
o-mu-enge   gu-nyogoga
AUG-NC3-beer NC3-cold

'The beer is cold.'   VERB

(101) *Kizuule wa   mazima.*
Kisuule o-a   ma-zima
Kisuule NC1-GEN NC6-truth

'Kisuule is honest.'   NOUN

I briefly outline here some of the morphosyntactic properties that distinguish these three cat-
egories. First, verbs can be predicated directly of a subject, while adjectives and nouns require
a copula (which is null in clauses with a third person subject in the present tense as in (99) and
(101)). Compare (102) with (103) and (104):

(102) *Omwenge   gwanyogoga.*
o-mu-enge   gu-a-nyogoga
AUG-NC3-beer NC3-PST-cold

'The beer was cold.'   VERB

(103) *Kizito *(yali)   muwanvu.*
Kizito a-a-li   mu-wanvu
Kizito NC1-PAST-COP NC1-tall

'Kizito was tall.'   ADJECTIVE

(104) *Kizito *(yali)   musawo.*
Kizito a-a-li   mu-sawo
Kizito NC1-PAST-COP NC1-doctor

'Kizito was a doctor.'   NOUN

Second, while both adjectives and verbs must agree with their subject in noun class, adjectives
and verbs have different agreement prefixes for certain noun classes, as illustrated in (105) and

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(106). Nouns, meanwhile, have an inherent noun class and almost never agree with the subject;
see (107).[7]

(105)　　*Omuti*　　　　***mu****wanvu.*
　　　　　o-mu-ti　　　**mu**-wanvu
　　　　　AUG-NC3-tree NC3-tall
　　　　　'The tree is tall.'　　　　　　　　　　　　　　　　　　　　　　　　ADJECTIVE

(106)　　*Omuti*　　　　***gu****nyogoga.*
　　　　　o-mu-ti　　　**gu**-nyogoga
　　　　　AUG-NC3-tree NC3-cold
　　　　　'The tree is cold.'　　　　　　　　　　　　　　　　　　　　　　　　VERB

(107)　　*Ekitooke*　　　　***mu****ti*　　*/ *kiti.*
　　　　　e-ki-tooke　　　　mu-ti　　/ ki-ti
　　　　　AUG-NC7-banana.tree NC3-tree / NC7-tree
　　　　　'The banana tree is a tree.'　　　　　　　　　　　　　　　　　　　NOUN

Another way in which adjectives and verbs are distinct is with respect to the nominalizing
prefixes they combine with. As we have already seen, the nominalizer *bu-* selects for adjectives to
create an abstract noun, while the nominalizer *ku-* selects for verbs to create the infinitival form;
cf. (95)-(96).

Within the class of nouns, one peculiarity we find is that nouns that lexicalize gradable prop-
erties (or property concepts in the sense of Dixon 1982) are associated with a distinct syntax from
other nouns when used predicatively. Specifically, while nouns can typically be predicated di-

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7. An exception appears to be nouns that name professions, which do agree with the subject. Compare the noun
class prefixes in (104) and (1) below:

(1)　　*Enkima*　　　*nsawo*　　*/ *musawo.*
　　　　e-N-kima　　　N-sawo　　/ mu-sawo
　　　　AUG-NC9-monkey NC9-doctor / NC1-doctor
　　　　'The monkey is a doctor.'

rectly of a subject,[8] nouns that name gradable properties require the genitive particle *-a* to be used predicatively.[9] Compare (108) and (109), repeated from above. Another example is given in (110).

(108) *Ekitooke*   *muti.*
        e-ki-tooke   mu-ti
        AUG-NC7-banana.tree NC3-tree
        'The banana tree is a tree.'

(109) *Kizuule wa*   *mazima.*
        Kisuule o-a   ma-zima
        Kisuule NC1-GEN NC6-truth
        'Kisuule is honest.'

(110) *Omuti*   *gwa*   *kiragala.*
        o-mu-ti   gu-a   ki-ragala
        AUG-NC3-tree NC3-GEN NC7-green
        'The tree is green.'

Certain nouns like *mazima* 'truth' in (109) cannot be predicated directly of an individual. This appears to be an instance of a possessive strategy of predication (Koontz-Garboden & Francez, 2010; Francez & Koontz-Garboden, 2012), whereby the noun must be accompanied by the genitive particle *-a* in order to be used predicatively. I reserve a more detailed discussion and analysis of this phenomenon for later in section 3.6. For now, I simply note that the constituent [GEN + NOUN] appears in the canonical predicate position in Luganda. Just as with other nouns and adjectives in predicative position, an overt copula is required in clauses using the possessive strategy of predication in a non-present tense and/or with a non-third person subject. An example with a first person subject is shown in (111):

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8. Recall that nouns used predicatively must be accompanied by a copula verb, which is null in the present tense with third person subjects, as in (108) and (109).

9. I follow the terminology of Crabtree (1921) in referring to this as a genitive particle. This particle is referred to as the "-A of relationship" in Ashton et al. 1954: 432-4, and as a possessive marker in Chesswas 1963:20

(111) *(Ndi)   wa   mazima.
       N-li   o-a   ma-zima
       1SG-COP NC1-GEN NC6-truth
       'I am honest.'

With these facts in mind, we can now turn to the main discussion of this chapter, namely the syntax and semantics of comparative constructions in this language.

3.3   Exceed and cleft comparisons in Luganda

In this section I describe the basic properties of the three types of comparatives observed in Luganda: exceed comparisons, of which there are two types; and cleft constructions.

3.3.1   Main verb exceed comparison

The primary means of expressing comparison in Luganda is through a verb *okusinga* whose lexical meaning is 'exceed', and whose direct object is the standard of comparison. This verb can appear as the main verb of a clause, fully inflected for tense and noun class agreement. The dimension upon which the comparison is based is introduced by a nominal form, usually a nominalized gradable predicate. The basic surface word order of main verb *exceed* comparisons (Stassen's *Exceed-2* constructions) is given as in (112):

(112) TARGET OF   - **EXCEED** - STANDARD OF - NOMINAL(IZED)
       COMPARISON   **VERB**   COMPARISON   GRADABLE PREDICATE

When the relevant gradable predicate is an adjective, it appears with the nominalizer *bu-* as in (113). When a comparison is based on a property named by a verb phrase, this phrase appears with the nominalizer *ku-*, as in (114).

(113) *Kizito **asinga**   Kato o**bu**kulu.*
       Kizito a-singa   Kato o-bu-kulu
       Kizito NC1-exceed Kato AUG-NC14-old
       'Kizito is older than Kato.'

       lit.: 'Kizito exceeds Kato in oldness.'

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(114) *Charlotte **yasinga*** *Rita **oku**wandiika* *amabaluwa.*
Charlotte a-a-singa Rita o-ku-wandiika a-ma-baluwa
Charlotte NC1-PST-exceed Rita AUG-NC15-write AUG-NC6-letter

'Charlotte wrote more letters than Rita.'

lit.: 'Charlotte exceeds Rita in writing letters.'

The relevant dimension in (114) is in fact left underspecified, and can be retrieved from context; the translation provided is just one interpretation of (114). In an out-of-the-blue context, the consultant reports that (114) could have various interpretations: that Charlotte wrote more letters than Rita (amount); that Charlotte wrote better letters than Rita (quality); or that Charlotte write letters more often than Rita (frequency). Each of these readings can be made explicit by adding an adjective or adverb that names that dimension, as shown in (115):

(115) *Charlotte yasinga* *Rita okuwandiika* *amabaluwa* {*amangi* /
Charlotte a-a-singa Rita o-ku-wandiika a-ma-baluwa a-ma-ngi /
C NC1-PST-exceed R AUG-NC15-write AUG-NC6-letter AUG-NC6-many /
amalungi / *emirundi* *mingi*}.
a-ma-lungi / e-mi-lundi mi-ngi
AUG-NC6-nice / AUG-NC4-time NC4-many

'Charlotte wrote {more/better} letters {more often} than Rita.'

Given that adjectives and verb phrases must be nominalized to appear in this position in the main verb exceed comparatives, we might expect that gradable predicates that are lexicalized as nominals should naturally fit directly into this position. Since they are already nominals, they shouldn't need to be nominalized. Indeed, derivations of these nominals with *bu-* are not possible:

(116) *ma-zima* 'NC6-truth' → **bu-zima*

There is in fact some idiosyncrasy as to whether such a nominal can appear directly in this position.[10] For example, *kiragala* 'green' is fine in this position on its own as in (117),[11] while

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10. I refer to this as idiosyncrasy because I do not have a principled explanation for why we find this variation. I leave further investigation for future work.

11. I do not know why *kiragala* does not take an augmented form in this example.

mazima 'truth' is not, and requires a nominalization of the full genitive construction with the copula, as shown in (118).

(117) *Omuti   guno   gusinga   guli   kiragala.*
       o-mu-ti   gu-no   gu-singa   gu-li   ki-ragala
       AUG-NC3-tree NC3-PROX NC3-exceed NC3-DIST NC7-green
       'This tree is more green than that one.'

(118) *Kisuule asinga   Ryan *(okuba   ow')   amazima.*
       Kisuule a-singa   Ryan *(o-ku-ba   o-o-a)   a-ma-zima
       Kisuule NC1-exceed Ryan AUG-NC15-COP AUG-NC1-GEN AUG-NC6-truth
       'Kisuule is more honest than Ryan.'

While I will say more about the interpretation of main verb exceed comparatives in section 3.4, I point out here that the use of this comparison construction does not entail that the positive form of the predicate holds of either the target or standard. As shown in (119), denying that the positive form holds of the target of comparison does not lead to contradiction.

(119) *Omuti   gusinga   enkima   obuwanvu,   naye omuti   ssi*
       o-mu-ti   gu-singa   e-N-kima   o-bu-wanvu naye o-mu-ti   ssi
       AUG-NC3-tree NC3-exceed AUG-NC9-monkey AUG-NC14-tall but AUG-NC3-tree NEG
       muwanvu.
       mu-wanvu
       NC3-tall
       'The tree is taller than the monkey, but the tree is not tall.'

As for the syntax of this construction, I assume that the exceed verb takes the standard and target of comparison as its internal and external arguments, respectively, and that the nominal(ized) predicate is VP adjoined. Evidence that this nominal is an adjunct and not an argument of the verb comes from passivization. Internal arguments can be passivized in Luganda. In particular, following the terminology of Bresnan & Moshi (1990), Luganda is a symmetric-type language, meaning that both objects in a double object construction like (120) can be passivized, as shown in (121) (cf. Ssekiryango, 2006; Pak, 2008).

(120) *Kato awa   Kityo ekitabo.*
Kato a-w-a   Kityo e-ki-tabo
Kato NC1-give-FV Kityo AUG-NC7-book
'Kato gives Kityo the book.'

(121) a. *Kityo awebwa   ekitabo.*
Kityo a-w-ebw-a   e-ki-tabo
Kityo NC1-give-PASS-FV AUG-NC7-book
'Kityo is given the book.'

b. *Ekitabo   kiwebwa   Kityo.*
e-ki-tabo   ki-w-ebw-a   Kityo
AUG-NC7-book NC7-give-PASS-FV Kityo
'The book is given to Kityo.'

With this in mind, we observe that the internal argument of *-singa* 'exceed' (i.e., the standard of comparison) can be passivized, while the nominal predicate naming the dimension in a main verb exceed comparison cannot. Compare (122)-(123):

(122) *Kato asingibwa   obuwanvu.*
Kato a-sing-ibw-a   o-bu-wanvu
Kato NC1-exceed-PASS-FV AUG-NC14-tall
'Kato is exceeded in tallness.'

(123) * *Obuwanvu   busingibwa   Kato.*
o-bu-wanvu   bu-sing-ibw-a   Kato
AUG-NC14-tall NC14-exceed-PASS-FV Kato

Thus, the nominal predicate naming the dimension of the comparison does not behave like an argument of the verb *-singa* 'exceed'.

Furthermore, the nominal(ized) predicate can be omitted if the relevant dimension is recoverable from context. However, unlike true arguments of the verb, there no object marking on the verb when this constituent is omitted (cf. 93):

(124) *Kizito asinga   Kato.*
Kizito a-singa   Kato
Kizito NC1-exceed Kato
'Kizito exceeds Kato.'

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Evidence that the adjunction must be at least at the VP level, though below TP, comes from coordination. While a string of the exceed verb, direct object, and adjoined nominal can be coordinated with another such string, a coordination of two strings consisting of just the direct object and adjoined nominal cannot; compare (125)-(126):

(125) *Tewali* [*asinga*   *Kato obuwanvu*]   *n'* [*asinga*   *ne*   *Kisuule obunene*].
      tewali a-singa   Kato o-bu-wanvu   ne a-singa   ne   Kisuule o-bu-nene
      nobody NC1-exceed Kato AUG-NC14-tall and NC1-exceed also Kisuule AUG-NC14-fat
      'Nobody exceeds Kato in tallness and also exceeds Kisuule in fatness.'

(126) * *Kizito asinga*   [*Kato obukulu*]   *ne* [*Kisuule obuwanvu*].
      Kizito a-singa   Kato obukulu   ne Kisuule o-bu-wanvu
      Kizito NC1-exceed Kato AUG-NC14-old and Kisuule AUG-NC14-tall
      Intended: 'Kizito exceeds Kato in oldness and Kisuule in tallness.'

I assume that the adjoined nominal is licensed by the presence of the augment, following Halpert (2012) for Zulu.

That the exceed verb and the standard of comparison form a constituent can also be shown through coordination, as in (127):

(127) *Kizito* [**asinga**   **Kato**] *naye* [**yenkana**   **Kisuule**] *obuwanvu.*
      Kizito a-singa   Kato naye a-enkana   Kisuule o-bu-wanvu
      Kizito NC1-exceed Kato but   NC1-equal Kisuule AUG-NC14-tall
      'Kizito is taller than Kato but as tall as Kisuule.'

      Lit. 'Kizito exceeds Kato but is equal to Kisuule in tallness.'

This makes sense if the exceed verb and standard of comparison form a constituent to the exclusion of the adjoined nominal.[12]

3.3.2   Subordinate exceed comparatives

In addition to the main verb exceed construction, Luganda also makes use of a second type of exceed comparison, in which the exceed verb and its object appear within a *ku-* nominalization.

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12. It is also possible that *obuwanvu* in (127) has undergone right node raising. I set aside this complication.

By contrast, the gradable predicate that is nominalized in the main verb construction serves as the main predicate in this second construction. The basic surface word order for what I will call the subordinate exceed comparative (Stassen's *Exceed-3* constructions) is given in (128):

(128) TARGET OF   - GRADABLE - **NOMINALIZED** - STANDARD OF
       COMPARISON   PREDICATE   **EXCEED VERB**   COMPARISON

Just as with main verb exceed comparisons, the gradable predicate upon which the comparison is based can be an adjective, verb (phrase), or nominal, as shown in (129)-(131).

(129) *Kizito mukulu **okusinga**   Kato.*
       Kizito mu-kulu o-ku-singa   Kato
       Kizito NC1-old AUG-NC15-exceed Kato
       'Kizito is older than Kato.'

       lit.: 'Kizito is old, exceeding Kato.'

(130) *Charlotte yawandiika   amabaluwa   **okusinga**   Rita.*
       Charlotte a-a-wandiika   a-ma-baluwa   o-ku-singa   Rita
       Charlotte NC1-PST-write AUG-NC6-letter AUG-NC15-exceed Rita
       'Charlotte wrote more letters than Rita.'

       lit.: 'Charlotte wrote letters, exceeding Rita.'

(131) *Kisuule wa   mazima **okusinga**   Ryan.*
       Kisuule o-a   ma-zima o-ku-singa   Ryan
       Kisuule NC1-GEN NC6-truth AUG-NC15-exceed Ryan
       'Kisuule is more honest than Ryan.'

       lit.: 'Kisuule is of truth, exceeding Ryan.'

As was the case with main verb exceed comparisons, the dimension for sentences like (130) is underspecified, with the translation offered indicative of only one of the possible interpretations. The relevant dimension (e.g., amount, quality, frequency) can be made explicit by adding the appropriate modifier, as shown in (132) (compare 115).

(132) *Charlotte yawandiika   amabaluwa   {amangi   / amalungi   /*
Charlotte a-a-wandiika   a-ma-baluwa   a-ma-ngi   / a-ma-lungi   /
Charlotte NC1-PST-write AUG-NC6-letter AUG-NC6-many / AUG-NC6-nice /

emirundi   mingi}   okusinga   Rita.
e-mi-lundi   mi-ngi   o-ku-singa   Rita
AUG-NC4-time NC4-many AUG-NC15-exceed Rita

'Charlotte wrote {more/better} letters {more often} than Rita.'

Like main verb exceed comparisons, subordinate exceed comparisons do not entail that the positive form holds of the target or standard. Note that (133) is not contradictory:

(133) *Omuti   muwanvu okusinga   enkima,   naye omuti*
o-mu-ti   mu-wanvu o-ku-singa   e-N-kima   naye o-mu-ti
AUG-NC3-tree NC3-tall   AUG-NC15-exceed AUG-NC9-monkey but   AUG-NC3-tree

ssi   muwanvu.
ssi   mu-wanvu
NEG NC3-tall

'The tree is taller than the monkey, but the tree is not tall.'

I assume that the *okusinga* phrase is adjoined to the AP. Evidence that the adjunction occurs below TP comes from the coordination in (134), where the main predicate and the *okusinga* phrase can be coordinated to the exclusion of the subject. Meanwhile, evidence that the adjunction must be at least as high as AP comes from (135), where just the main predicate can be coordinated with another predicate, to the exclusion of the *okusinga* phrase.

(134) *Tewali [mukulu okusinga   Kato] nga [muwanvu okusinga   Kisuule].*
tewali   mu-kulu o-ku-singa   Kato nga mu-wanvu o-ku-singa   Kisuule
nobody NC1-old AUG-NC15-exceed Kato and NC1-tall   AUG-NC15-exceed Kisuule

'Nobody is older than Kato and taller than Kisuule.'

lit.: 'Nobody is old exceeding Kato and tall exceeding Kisuule.'

(135) *Kizito [muwanvu] ne [munene] okusinga   Kato.*
Kizito mu-wanvu ne   mu-nene o-ku-singa   Kato
Kizito NC1-tall   and NC1-fat AUG-NC15-exceed Kato

'Kizito is taller and fatter than Kato.'

lit.: 'Kizito is tall and fat, exceeding Kato.'

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As before, I assume that the nominal adjunct is licensed by the presence of the augment on the *ku-* nominalization.

3.3.3   Cleft comparisons

While exceed constructions are the primary means for expressing comparison in Luganda, speakers also make use of a cleft construction in comparison contexts. This construction contains the particle *-e*, which takes a prefix that agrees in noun class with the subject. Ashton et al. (1954) describe the function of this construction as one of conveying emphasis or bringing a constituent (the one appearing before *-e*) into prominence (pp.439-444). Many of their examples are translated into English as cleft constructions:

(136)   *Abalenzi*   *abo*   *abakulu*   ***be***   *banjagala.*
        a-ba-lenzi   a-ba-o   a-ba-kulu   **ba-e**   ba-N-agala
        AUG-NC2-boy   AUG-NC2-DEIC   AUG-NC2-old   NC2-CLEFT   NC2-1SG-like
        'It's the big boys who like me.'   (Ashton et al., 1954, p.441; my morpheme parse)

(137)   *Mukiyungu*   *kino*   ***mwe***   *tufumbira*   *emmere.*
        mu-ki-yungu   ki-no   **mu-e**   tu-fumb-ir-a   e-N-mere
        NC18-NC9-kitchen   NC9-PROX   NC18-CLEFT   1PL-cook-APPL-FV   AUG-NC9-food
        'It's in this kitchen we cook the food.'

                                           (Ashton et al., 1954, p.442; my morpheme parse)

Ashton et al. (1954) also recognize that such constructions can have a comparative function (p.443). In this construction, no dedicated comparative or standard-marking morphology is present. In fact, the standard of comparison is left implicit in this construction. An example is given in (138), repeated from above.

(138)   *Kizito ye*   *mukulu.*
        Kizito a-e   mu-kulu
        K   NC1-CLEFT   NC1-old
        'Kizito is older (than other people/things in a context).'

        lit.: 'Kizito is the one who is old.'

A natural use for a sentence like (138) would be as an answer to the question: "Who is older, Kizito or Kato?"

When a cleft construction formed with a non-gradable verb as the main predicate, it is not easily interpreted as comparative. As shown in (139), such a sentence is grammatical, but appears to have only a "regular" cleft interpretation. However, the addition of a modifier that explicitly introduces a gradable dimension makes available a comparative interpretation, as shown in (140)-(141).

(139) *Kizito y'   alya.*
      Kizito a-e   a-lya
      Kizito NC1-CLEFT NC1-eat
      'Kizito is the one who eats/is eating.'

      #'Kizito eats more (than other people/things in the context).'

      Speaker's comment: "It sounds like Kizito is the only one who is eating. It's not compara-
      tive."

(140) *Charlotte ye   yawandiika   amabaluwa   mangi.*
      Charlotte a-e   a-a-wandiika a-ma-baluwa ma-ngi
      Charlotte NC1-CLEFT NC1-PST-write AUG-NC6-letter NC6-many
      'Charlotte wrote more letters (than some contextually salient individual).'

(141) *Rita ye   yawandiika   amabaluwa   amalungi.*
      Rita a-e   a-a-wandiika a-ma-baluwa a-ma-lungi
      Rita NC1-CLEFT NC1-PST-write AUG-NC6-letter AUG-NC6-nice
      'Rita wrote nicer letters (than some contextually salient individual).'

Gradable predicates that are lexicalized as nouns and require the genitive particle for predication can also appear in clefts and receive a comparative interpretation, as shown in (142):

(142) *Kizito ye   wa   mazima.*
      Kizito a-e   o-a   ma-zima
      Kizito NC1-CLEFT NC1-GEN   NC6-truth
      'Kizito is more honest (than some contextually salient individual).'

There is evidence that cleft comparisons seem to invite an inference that the positive form holds of the subject. As shown in (143), it is odd to deny that the positive form holds of the subject.

(143) # *Omuti*   *gwe*   *muwanvu, naye omuti*   *ssi* *muwanvu.*
       o-mu-ti   gu-e   mu-wanvu naye o-mu-ti   ssi mu-wanvu
       AUG-NC3-tree NC3-CLEFT NC3-tall   but AUG-NC3-tree NEG NC3-tall

       Intended: 'The tree is taller, but the tree is not tall.'

However, as an alternative to (143), the consultant offered the sentence in (144), with the addition of the adverb *nnyo*, glossed here as 'very':

(144) *Omuti*   *gwe*   *muwanvu, naye omuti*   *ssi* *muwanvu* *nnyo.*
       o-mu-ti   gu-e   mu-wanvu naye o-mu-ti   ssi mu-wanvu nnyo
       AUG-NC3-tree NC3-CLEFT NC3-tall   but AUG-NC3-tree NEG NC3-tall   very

       'The tree is taller, but the tree is not very tall.'

What appears to be going on here is that the speaker hedges on the extent to which the positive form holds of the subject: the tree is tall, but not *very* tall.[13]

Now that I have outlined some of the basic facts about the structure and interpretation of exceed and cleft comparisons in Luganda, I turn to more specific issues that will help guide our analysis of these constructions. Specifically, in the next section we will examine how these constructions pattern with respect to the explicit versus implicit distinction, and in section 3.5 we will consider the distinction between phrasal versus clausal comparatives.

3.4   Explicit versus implicit comparison

Recall the distinction made between explicit versus implicit comparisons in chapter 2, following Kennedy (2007a). The definitions are repeated below:

(145) a. *Explicit comparison*: establishes an ordering relation between objects x and y with respect to a gradable property g using a morphosyntactic form whose conventional meaning has the consequence that the degree to which x is g exceeds the degree to which y is g.

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13. See Horn (1989) for the hedging use of *very* in English.

b. *Implicit comparison*: establishes an ordering between objects *x* and *y* with respect to a gradable property *g* using the positive form by manipulating the context in such a way that the positive form is true of *x* and false of *y*.

Three tests for distinguishing explicit from implicit comparisons are (i) felicity in crisp judgment contexts; (ii) felicity with absolute standard predicates; and (iii) acceptability with differential measure phrases. Given certain idiosyncrasies with measure phrases in Luganda, which will be examined further detail in chapter 4, I will concentrate on the first two tests to determine the status of exceed and cleft comparisons with respect to the explicit/implicit distinction. We will see that both versions of exceed comparison are explicit comparisons, while the cleft construction is an example of implicit comparison.

3.4.1   Exceed comparisons are explicit comparisons

First, let us apply the tests to main verb and exceed comparisons. It turns out that both varieties of exceed comparison in Luganda pattern like explicit comparison according to the relevant diagnostics.

3.4.1.1   Crisp judgments

The first diagnostic involves testing the felicity of comparisons in crisp judgment contexts. Recall that the positive form of the adjective is vague (Kennedy, 2007c), so it is difficult to make distinctions between objects that are very close to one another in the degree to which they hold a property. Crisp judgment tests can be used to tease apart the explicit versus implicit comparative distinction due to the vagueness of the positive form. Specifically, the prediction made is that explicit comparatives are able to distinguish very small differences between compared objects since they simply require an asymmetric ordering between degrees, while implicit comparatives should be infelicitous in such contexts because the positive form requires an object to stand out in the

degree to which it expresses a property. As shown in the following examples, both versions of exceed comparisons in Luganda are felicitous in crisp judgment contexts:

(146) a. Context: comparing a red book that is 500 pages long and a blue book that is 499 pages long

   b. *Ekitabo*　　*ekimyufu*　*kisinga*　*eky'*　　　*abulu obwanvu.*
       e-ki-tabo　　e-ki-myufu　ki-singa　e-ki-a　　　abulu o-bu-wanvu
       AUG-NC7-book AUG-NC7-red NC7-exceed AUG-NC7-GEN blue　AUG-NC14-long
       'The red book is longer than the blue one.'　　　　　　　　　　　MAIN VERB

(147) a. Context: same as (146)

   b. *Ekitabo*　　*ekimyufu*　*kiwanvu okusinga*　　*eky'*　　*abulu.*
       e-ki-tabo　　e-ki-myufu　ki-wanvu o-ku-singa　　e-ki-a　　abulu
       AUG-NC7-book AUG-NC7-red NC7-long AUG-NC15-exceed AUG-NC7-GEN blue
       'The red book is longer than the blue one.'　　　　　　　　　　SUBORDINATE

The felicity of both (146) and (147) indicate that these comparisons may be used to distinguish very small differences between the compared objects, therefore patterning like explicit comparison according to this test.

3.4.1.2　Absolute standard adjectives

The second relevant diagnostic tests the felicity of comparisons with minimum standard adjectives. Recall that certain adjectives (e.g. *wet*, *bent*) have minimum standards, as opposed to context-dependent ones (Rotstein & Winter, 2004; Kennedy & McNally, 2005). Thus the prediction of testing comparatives with minimum standard adjectives is that implicit comparatives should be infelicitous since the standard is no longer context-dependent. As the following examples show, both types of exceed comparisons are acceptable with the minimum-standard predicate *-kyamu* 'bent':

(148) a. Context: comparing two sticks A and B, both bent, but stick A is more bent than stick B

b. *Omuti*   *A gusinga*   *omuti*   *B obukyamu.*
   o-mu-ti   A gu-singa   o-mu-ti   B o-bu-kyamu
   AUG-NC3-stick A NC3-exceed AUG-NC3-stick B AUG-NC14-bent

   'Stick A is more bent than stick B.'   MAIN VERB

(149) a. Context: same as (148)

   b. *Omuti*   *A mukyamu okusinga*   *omuti*   *B.*
      o-mu-ti   A mu-kyamu o-ku-singa   o-mu-ti   B
      AUG-NC3-stick A NC3-bent   AUG-NC15-exceed AUG-NC3-stick B

      'Stick A is more bent than stick B.'   SUBORDINATE

Once again, the felicity of both (148) and (149) provides evidence that these comparisons are indeed instances of explicit comparison.

We have evidence, then, that exceed comparatives have as part of their conventional meaning an asymmetric ordering relation between the degrees to which the target and standard hold a gradable property. I propose that the exceed verb has this function. However, I postpone an analysis of the exceed verb as a comparative morpheme until after section 3.5, where we consider the phrasal/clausal distinction.

3.4.2 Cleft comparisons are implicit comparisons

In contrast to exceed comparisons, cleft comparisons in Luganda pattern like implicit comparison. These constructions fail Kennedy's tests for explicit comparison.

First, in a crisp judgment context, we see that cleft comparisons are unacceptable:

(150) a. Context: comparing a red book that is 500 pages long and a blue book that is 499 pages long (= (146))

   b. # *Ekitabo*   *ekimyufu*   *kye*   *kiwanvu.*
        e-ki-tabo   e-ki-myufu   ki-e   ki-wanvu
        AUG-NC7-book AUG-NC7-red   NC7-CLEFT NC7-long

        'The red book is the one that is long.'

Second, this construction is also unacceptable with minumum-standard predicates such as *-kyamu* 'bent':

(151) a. Context: comparing two sticks A and B, both bent, but stick A is more bent than stick B (= (148))

b. # *Omuti*   *A gwe*   *mukyamu.*
   o-mu-ti   A gu-e   mu-kyamu
   AUG-NC3-stick A NC3-CLEFT NC3-bent
   'Stick A is the one that is bent.'

Thus, according to Kennedy's diagnostics, cleft comparisons are implicit comparisons. That is, we have no evidence that a comparative morpheme is implicated in this construction.

I propose that we analyze cleft comparisons simply as cleft sentences, whereby the meaning of comparison is an inference that is derived from the semantic contributions of the cleft construction and the gradable predicate. Cleft sentences (in English) of the form *it is x that P* have been analyzed as presupposing exhaustiveness, i.e., that *x* is the only individual (singular or plural) that satisfies *P* in the relevant context (Halvorsen, 1978; Horn, 1981). For concreteness, I follow a recent analysis of clefts by Büring & Križ (2012), who characterize the exhaustivity presupposition as a conditional presupposition as in (152):

(152) It was Fred she invited.

a. ASSERTION: She invited Fred.

b. PRESUPPOSITION: If she invited Fred, she didn't invite anyone else.

There is evidence that the cleft construction in Luganda also carries an inference of exhaustiveness. For instance, it is odd to use a cleft construction with main predicate *P*, and then continue with *and also P(y)*, as shown in (153). Using a cleft in (154) is also odd, where the context provides that Charlotte is not the only one who was sewing.

(153) # *Kizito y'*   *alya,*   *ne Kato naye alya.*
   Kizito a-e   a-lya   ne Kato naye a-lya
   Kizito NC1-CLEFT NC1-eat and Kato also NC1-eat

Intended: 'It is Kizito who is eating, and Kato is also eating.'

Speaker's comment: "It sounds like Kizito is the only one eating, but Kato is also eating."

(154) a. Context: This afternoon, you were looking after your daughters, Charlotte and Rita, and their friend Alice. Charlotte and Alice were both sewing, and Rita watched a movie. Your wife Lydia comes home, and you want to tell her about what happened while she was gone.

   b. # *Charlotte ye   yatunga.*
      Charlotte a-e   a-a-tunga
      Charlotte NC1-CLEFT NC1-PST-sew
      Intended: 'Charlotte was sewing.'

Based on such evidence, I conclude that clefts in Luganda carry an inference of exhaustivity, like their English counterparts.[14]

Let us now extend this account to cases where a gradable predicate appears in a cleft construction to yield a comparative interpretation. Consider again the cleft comparison in (155), repeated from above, along with the inferences associated with clefts in terms of the analysis of Büring & Križ (2012):

(155) *Kizito ye   mukulu.*
   Kizito a-e   mu-kulu
   K   NC1-CLEFT NC1-old
   'Kizito is older (than other people/things in a context).'

   a. ASSERTION: Kizito is old.

   b. PRESUPPOSITION: If Kizito is old, then no one else counts as old.

According to the analysis we have adopted for clefts, in uttering (155) a speaker asserts that Kizito

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14. I leave open whether the Büring & Križ (2012) analysis is necessarily the correct one for clefts in Luganda (or English, for that matter). What matters here is that there is some inference of exhaustivity associated with clefts in Luganda, whatever the correct characterization of that inference may be.

is old, and presupposes that if Kizito counts as old, then no one else (in the relevant context) counts as old. This analysis straightforwardly accounts for how a comparative interpretation for clefts comes about. Recall from chapter 2 the consistency constraints on the use and interpretation of gradable predicates in the general case (Klein, 1980; Kennedy, 2011):

(156)   Consistency constraints:

a. For any positive gradable predicate g and objects x and y in its domain, and for any context c, if g holds of x but not of y in c, then x exceeds y relative to the scalar concept encoded by g.

b. For any positive form gradable predicate g and objects x and y in its domain, if there is a context c such that g holds of x but not of y in c, then for any c' such that g holds of y in c', then g also holds of x in c'.

In particular, since (155) presupposes that if Kizito is old, then no one else in the context counts as old, then it follows from (156a) that Kizito occupies a higher position on the age scale than the other contextually relevant individuals. That is, the presupposition of cleft constructions together with the independently motivated constraint on gradable predicates in (156a) conspire together to yield a comparative interpretation for clefts with gradable predicates.

While clefts in Luganda are implicit comparison constructions, there are certain differences between cleft comparisons and *compared to* constructions like (157) in English.[15]

(157)   Compared to Lee, Kim is tall.

First, while it is quite clear that sentences like (157) do not commit the speaker to the truth of *Kim is tall*, it appears the cleft comparisons in Luganda do invite such an inference, as shown in (143), repeated from above.

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15. There are of course other implicit comparison constructions in English, including clefts (cf. *Joe is the one who is tall*). I limit the focus here to *compared to* constructions since they are the best studied in English. A more detailed comparison between implicit comparison constructions in English is left for future research.

(158)   # *Omuti   gwe   muwanvu, naye omuti   ssi   muwanvu.*
             o-mu-ti   gu-e   mu-wanvu naye o-mu-ti   ssi   mu-wanvu
             AUG-NC3-tree NC3-CLEFT NC3-tall   but AUG-NC3-tree NEG NC3-tall

             Intended: 'The tree is taller, but the tree is not tall.'

I submit that this fact is due to the assertion aspect of the meaning of the cleft as modeled in (152). The first clause in (158) contains the assertion that the tree is tall, and then to explicitly deny that assertion in the following clause leads to a contradiction. As we have seen, however, a speaker may hedge in the second clause as a way of circumventing this problem; cf. (144).

    Second, while clefts with relative gradable predicates in Luganda readily allow for a comparison interpretation, clefts in English do not. That is, unlike in Luganda, a sentence like (159) seems to be a much less canonical way of forming a comparison in English.

(159)   It's Kim who is tall.

I tentatively assume this is due to the fact that English has another means for expressing implicit comparison, namely the *compared to* construction, and so the cleft in English does not easily take on a comparative function, even though their use brings about the same entailments based on the consistency constraints.

3.4.3   Interim conclusion

In sum, we have seen that both types of exceed comparison are examples of explicit comparison, indicating that there is an asymmetric ordering relation conventionalized in these constructions. I have tentatively concluded that it is the exceed verb that is associated with this function. Meanwhile, cleft comparisons were shown to be implicit comparisons, and I have offered an analysis of these constructions that follows from the semantic and pragmatic contribution of the cleft construction generally, along with certain properties of vagueness of the positive form of relative gradable adjectives. In the following section, I shift the focus strictly to exceed comparisons, and specifically to the phrasal vs. clausal distinction. Examining this issue will then lead us to a preliminary

analysis of the semantics of the exceed verb.

3.5   Phrasal versus clausal standards

As discussed in chapter 2, an important point of variation in comparative constructions, both across and within languages, is the syntactic status of the standard constituent. In particular, the standard constituent may be a full clause (parts of which may have been subject to ellipsis), or a DP. Furthermore, while clausal standards are typically taken to denote properties of degrees, phrasal standards typically denote individuals. In this section, we will investigate the status of the standard constituent in exceed comparisons.[16]

Based on what we have seen so far, it appears that standards in Luganda exceed comparisons are strictly phrasal. Recall that the standard occurs as the complement of the exceed verb in both main verb and subordinate exceed constructions. A couple of examples are repeated here:

(160) *Kizito asinga*   [*DP**Kato*] *obukulu.*
       Kizito a-singa   Kato   o-bu-kulu
       Kizito NC1-exceed Kato   AUG-NC14-old

       'Kizito is older than Kato.'   MAIN VERB EXCEED

(161) *Charlotte yawandiika*   *amabaluwa*   *okusinga*   [*DP**Rita*].
       Charlotte a-a-wandiika   a-ma-baluwa   o-ku-singa   Rita
       Charlotte NC1-PST-write AUG-NC6-letter AUG-NC15-exceed Rita

       'Charlotte wrote more letters than Rita.'   SUBORDINATE EXCEED

As we have already seen in chapter 2, however, what appear to be phrasal standards may in fact be underlyingly clausal. In fact Lechner (2001) proposes that what appear to be phrasal comparatives in English are actually reduced clausal comparatives.[17] In these cases, the application

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16. Since cleft comparisons do not contain an overt standard, they will not be considered here.

17. It should be noted that this claim about English clausal comparatives is not universally accepted; see for instance Heim (1985) and Kennedy (1997).

of ellipsis operations obscures the clausal source of superficially phrasal comparatives. In this section, I show that standards in Luganda exceed comparatives are in strictly phrasal.

3.5.1   Diagnosing clausal comparatives

One piece of evidence for treating English comparatives as underlyingly clausal comes from the fact that multiple standards are possible within a single comparative sentence, as in (162). The clausal complement of *than* is subject to ellipsis, which can leave behind multiple remnants (Lechner, 2001; Merchant, 2009).

(162)   Dick read more books today than Jane ~~read~~ yesterday.

In Luganda, such comparatives are ungrammatical, as shown in (163) and (164). The exceed verb can only take a single DP complement, resulting in a single standard restriction (Bhatt & Takahashi, 2011).

(163)   * [*Charlotte*] [*ku   mande*] *yasinga*   [*Rita*] [*ku   lw'okubiri*] *okuwandiika*
          Charlotte   ku   mande a-a-singa   Rita   ku   lw'okubiri o-ku-wandiika
          Charlotte   LOC Monday NC1-PST-exceed R   LOC Tuesday   AUG-NC15-write
          amabaluwa   amangi.
          a-ma-baluwa   a-ma-ngi
          AUG-NC6-letter AUG-NC6-many
          Intended: 'Charlotte wrote more letters on Monday than Rita wrote on Tuesday.' MAIN
          VERB

(164)   * *Charlotte yawandiika   amabaluwa   mangi   ku   mande*
          Charlotte a-a-wandiika   a-ma-baluwa   ma-ngi   ku   mande
          Charlotte NC1-PST-write AUG-NC6-letter NC6-many LOC Monday
          okusinga   [Rita] [ku   lw'okubiri].
          o-ku-singa   Rita   ku   lw'okubiri
          AUG-NC15-exceed Rita   LOC Tuesday
          Intended: 'Charlotte wrote more letters on Monday that Rita wrote on Tuesday.'

          SUBORDINATE

The intended meaning can indeed be expressed using a subordinate exceed construction, as in (165). However, in this sentence the complement of the exceed verb is still a single DP, albeit a complex one containing an object relative clause. This relative clause is headed by a null class 6 pro-form for *amabaluwa* 'letters', and contains both standards. The English translation in (165) reflects this syntax.

(165)   *Charlotte yawandiika   amabaluwa   mangi   ku   mande   okusinga*
         Charlotte a-a-wandiika   a-ma-baluwa   ma-ngi   ku   mande   o-ku-singa
         Charlotte NC1-PST-write AUG-NC6-letter NC6-many LOC Monday AUG-NC15-exceed
         [*Rita geyawandiika   ku   lw'okubiri*].
         Rita   ga-e-a-a-wandiika   ku   lw'okubiri
         Rita   NC6-REL-NC1-PST-write LOC Tuesday
         'Charlotte wrote many letters on Monday, exceeding the ones that Rita wrote on

         Tuesday.'   SUBORDINATE

Bhatt & Takahashi (2011) take the single standard restriction as an argument in favor of a phrasal analysis for comparatives in Hindi, and we can do the same here for Luganda exceed comparatives. Note that the existence of multiple remnants is not necessarily evidence for a reduced clausal analysis: Lin (2009) argues for a direct (non-reduction) analysis for Mandarin comparatives with multiple standards.

Another case in English where the complement of *than* is unambiguously clausal occurs in sub-comparatives like (166).

(166)   The table is longer than [$_{CP}$it is wide].

Such a meaning can be expressed in Luganda using the exceed constructions. However, as shown in (167) and (168), in both main verb and subordinate comparatives, the complement of the exceed verb is still a DP, as indicated by the English translations.

(167)   *Obuwanvu   bw'   emmeezza   businga   [$_{DP}$ obugazi   bwayo*].
         o-bu-wanvu   bu-a   e-N-meezza   bu-singa   o-bu-gazi   bu-ayo
         AUG-NC14-long NC14-GEN AUG-NC9-table NC14-exceed AUG-NC14-wide NC14-POSS
         'The table's length exceeds its width.'   MAIN VERB

(168) *Emmeezza   mpanvu okusinga   [DP obugazi   bwayo].*
      e-N-meeza   N-wanvu o-ku-singa   o-bu-gazi   bu-ayo
      AUG-NC9-table NC9-long AUG-NC15-exceed AUG-NC14-wide NC14-POSS
      'The table is long to exceed its width.'   SUBORDINATE

Another diagnostic for phrasal comparison from chapter 2 was the ability to have a reflexive pronoun as the standard, which is bound by the subject (e.g. *No star is brighter than itself*). This is possible by Condition A of Binding Theory, since the reflexive is bound in its minimal governing category if the complement of *than* is a DP and not a CP. While the behavior of reflexives and binding in Luganda has not been investigated in-depth, the following example is suggestive:

(169) *Tewali n'   omu amusinga   buwanvu.*
      tewali ne   omu a-mu-singa   bu-wanvu
      nobody even one NC1-NC1OBJ-exceed NC14-tall
      Prompt: 'No one is taller than himself.'

While there is no lexical object of the exceed verb in this example, the object marking on the verb indicates that it is a single human-class object. While this can hardly be considered airtight evidence for the ability of a reflexive to be bound by the subject (since there is no overt reflexive), this data is consistent with the view that the standard in this case is a DP, since it can be pronominalized like regular individual-denoting object arguments.

More investigation is required to fully flesh out the validity of this test for Luganda. Namely, it is interesting that the typical reflexivization verbal prefix is not used in (169). A reflexive verb is typically derived by adding the prefix *e-* to the verb stem, as shown in (170):

(170) *Kizito yeeyagala.*
      Kizito a-e-yagala
      Kizito NC1-REFL-like
      'Kizito loves himself.'

In sum, we seem to have no evidence that Luganda exceed comparatives are clausal comparatives. The standard phrases of exceed comparatives appear to be uniformly phrasal in nature.

The translation equivalents of clausal comparatives in English are uniformly rendered as phrasal comparatives in Luganda.

3.5.2 Individual versus degree standards

Alongside the phrasal versus clausal distinction we also find variation with the semantic type of the standard. Namely, the standard can be either individual-denoting, or degree-denoting (Kennedy, 2007a). Typically, degree standards are associated with the clausal analysis, whereby the clausal complement of *than* denotes a set of degrees, or a definite description of a degree (von Stechow, 1984; Heim, 2001; Pancheva, 2006). Thus, cases where we find and apparently phrasal standards that denote a degree are actually derived from a clausal source that is subject to ellipsis. One case in English where apparently phrasal comparatives admit a degree standard is in when a measure phrase is the standard (Kennedy, 1997).[18]

(171)   John is taller than five feet (*is).

Evidence that sentences like (353) are not reduced clausal structures comes from the fact that additional clausal material is never grammatical with measure phrase standards.

   As we will see in the next chapter, there are certain syntactic issues with the use of measure phrases in main verb and subordinate exceed comparatives, so I do not go into too many details here. For now, note that a measure phrase can appear as the standard in a subordinate exceed construction, but only when preceded by the locative marker *ku-*, as shown in (354); a plain measure phrase on its own is ungrammatical. Measure phrases cannot appear as the standard in a main verb exceed construction, as shown in (173). The only interpretation possible in this case is a differential one, indicating that in this sentence, the measure phrase is not the standard of comparison.

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18. See also Pancheva (2006) for measure phrase standards in Slavic languages. Although Lechner (2001) claims that all comparatives in English are clausal, he does not consider examples such as (353).

(172) *Kizito muwanvu okusinga   *(ku) mmita   bbiri.*
       Kizito mu-wanvu o-ku-singa   *(ku) N-mita   C-biri
       Kizito NC1-tall   AUG-NC15-exceed LOC NC10-meter NC10-two

       'Kizito is taller than two meters.'   SUBORDINATE

(173) *Kizito asinga   mmita   bbiri.*
       Kizito a-singa   N-mita   C-biri
       Kizito NC1-exceed NC10-meter NC10-two

       *'Kizito is taller than two meters.'

       OK: 'Kizito is two meters taller (than some standard).'   MAIN VERB

Assuming that measure phrases denote a degree or a set of degrees (Heim, 2001; Schwarzschild, 2005; Svenonius & Kennedy, 2006, among others), then it is the case that sometimes exceed comparatives can have degree standards, even though the standard must always be syntactically phrasal.[19] I furthermore argue in the next chapter that possessive nominalizations of gradable predicates also denote degrees, and can function as the (phrasal) standard of comparison; cf. (167), (168).

3.6   A look ahead

The results from the two previous sections indicate that there is a dedicated comparative morpheme at work in exceed constructions in Luganda, whose function is to set up the ordering relation between the individuals being compared, parallel with the morpheme *more/-er* in English. Furthermore, the standard constituent can denote either an individual or a degree, although syntactically it is always a phrasal (DP) constituent.

There are two theoretically plausible options for what the comparative morpheme may be. The first option would be to say that there is a silent comparative morpheme that encodes the

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19. The presence of the locative morpheme *ku* can perhaps be taken as evidence that the measure phrase is not a direct argument of the exceed verb, at least syntactically. I leave open this possibility for now, though more research is required on the behavior of measure phrases in this language. (Also see some discussion in chapter 4 on measure phrases.)

comparative semantics and that the exceed verb is a semantically vacuous standard marker. This type of analysis is pursued by Beck et al. (2004) and Bhatt & Takahashi (2011) for Japanese comparatives like (174), where *yori* is the semantically vacuous standard marker.

(174)   *Taroo-wa Hanako-yori(mo) kasikoi.*
        Taro-TOP Hanako-than   smart
        'Taro is smarter than Hanako.'   (Japanese; Bhatt & Takahashi, 2011, p.606)

The second option would be to say that the exceed verb encodes the comparative relation directly, while also functioning as a standard marker. This option is pursued by Kennedy (2007b) for Japanese, where *yori* encodes the comparative semantics directly. In fact, Kennedy considers the possibility (though ultimately does not advocate for the idea) that across all languages the comparative semantics in encoded in the standard marker, while overt comparative morphology is vacuous. Many languages do not mark gradable predicates with overt comparative morphology. In fact, at least 59 out of the 110 languages of Stassen's typology (53.6%) show no overt comparative morphology marked on the gradable predicate. In this respect, Luganda patterns with the majority of the languages considered by Stassen. This observation is also one of the motivating factors for Kennedy's analysis of standard markers.

More recently, Alrenga et al. (2012) propose a division of semantic labor between comparative morphemes and standard markers, whereby both supply a comparative semantics. They argue for such a system in part to explain the typological facts that many languages appear to only have standard-marking morphology without comparative morphology marked directly on the predicate. I follow this second option for the analysis of exceed comparisons, assigning the comparative semantics to the exceed verb, or rather the root *-singa*, in Luganda. Note that the distinction between comparative morpheme and standard marker seem to collapse in this language. The verb encodes a comparative semantics, and its direct object is the standard of comparison.

While a more detailed analysis of the composition of exceed comparatives is the topic of the next chapter, I briefly outline here what semantic pieces are needed for such an analysis. First, let us assume that gradable predicates in Luganda are lexicalized as expressions that relate an

individual to a degree on a scale, following the standard analysis for English given in chapter 2 (following Cresswell, 1976; Heim, 1985, 2001; Kennedy & McNally, 2005; von Stechow, 1984, among others). The lexical entry for the adjective stem *-kulu* 'old' is given in (175):

(175) $[\![$ *-kulu* $]\!] = \lambda d\lambda x.\textbf{old}(x) \succeq d$

Recall, however, that gradable predicates in this language are not only lexicalized as adjectives, but also verbs and noun. Let us also assume the same sort of degree semantics for gradable predicates that are lexicalized as verbs. For example, the lexical entry for the verb stem *-nyogoga* 'cold' is given in (176):

(176) $[\![$ *-nyogoga* $]\!] = \lambda d\lambda x.\textbf{cold}(x) \succeq d$

In the case of gradable predicates that are lexicalized as nouns, something more needs to be said. Importantly, recall from section 3.2.2 that these cannot appear as predicates on their own, but must be accompanied by the the genitive particle to be used predicatively. Francez & Koontz-Garboden (2012) argue that such nominal-like roots in Ulwa do not themselves denote properties of individuals, but must combine with possessive morphology whose job it is to return a predicate of individuals. I implement this idea here by assigning nominal property concepts a denotation like in (177), namely a set of degrees.[20] Since such a meaning cannot be predicated of an individual directly, the genitive morphology in this construction takes this meaning and returns a gradable predicate that can participate in degree constructions, such as exceed comparison. The genitive marker encodes the possessive relation π, as shown in (178), and returns a gradable predicate such that an individual holds ("possesses") a property P to a degree d.[21] The result of combining nominal property concepts with the genitive morphology is a regular gradable predicate, as in (179), in the sense that it denotes a relation between an individual and a degree.

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20. In this sense, the denotation in (177) should be understood as a function from degrees d to true if d is a degree of green-ness.

21. The genitive particle is in fact polysemous, as will be argued in the next chapter, although it has a common semantic core of encoding a possession relation across all its uses.

(177) $⟦\textit{-ragala}⟧ = \lambda d.\textbf{green}(d)$

(178) $⟦\textsc{gen}⟧ = \lambda P \lambda d \lambda x.P(d) \mathbin{\&} \pi(x,d)$

(179) $⟦\textsc{gen}⟧(⟦\textit{-ragala}⟧) = \lambda d \lambda x.\textbf{green}(d) \mathbin{\&} \pi(x,d)$

Given that I have argued that exceed comparatives are phrasal comparatives, it seems natural to assign *-singa* a semantics as in (180), following the direct analysis for phrasal comparatives outlined in chapter 2. However, since phrasal standards can also be degree-denoting,[22] the variant in (181) must also be available.

(180) $⟦\textit{-singa}⟧ = \lambda x_{⟨e⟩} \lambda G_{⟨d,⟨e,t⟩⟩} \lambda y_{⟨e⟩}.\max(\lambda d.G(d)(y)) \succ \max(\lambda d'.G(d')(x))$

(181) $⟦\textit{-singa}⟧ = \lambda d'_{⟨d⟩} \lambda G_{⟨d,⟨e,t⟩⟩} \lambda y_{⟨e⟩}.\max(\lambda d.G(d)(y)) \succ d'$

In the next chapter, I will indeed make use of lexical entries for *-singa* along the lines of (180) and (181), although we will also encounter evidence that at least one more version of *-singa* must also be available in Luganda. For the time being, I simply note that the preliminary semantic pieces outlined in this section are needed to account for the data presented in this chapter, while a more fleshed out analysis of exceed comparatives awaits us in chapter 4.

3.7 Summary

We have seen that Luganda has two types of comparison constructions: exceed comparison, which is further divided into main verb and subordinate exceed constructions; and cleft comparison. Within the established semantic typologies of comparison, I showed that exceed constructions are explicit comparisons, while cleft constructions are implicit comparisons. Furthermore, exceed comparisons typically have individual standards, but also allow degree standards. I provided an analysis of cleft comparisons whereby the comparison meaning follows from the meaning of the

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22. Again, there are difficulties with the measure phrase data that still need to be explored. See discussion in chapter 4.

positive form of gradable predicates, plus the semantic contribution of the cleft construction. For exceed comparisons, I proposed that the exceed verb has the semantics of a comparative operator, which interacts with its arguments in a way fully expected by a 'direct' analysis of phrasal comparatives.

This type of analysis has two main consequences for the cross-linguistic picture emerging in this dissertation. On one hand, we note that despite the obvious syntactic differences between exceed comparisons and *-er/more* comparatives in English (and indeed comparative constructions in other languages that have been examined in the literature), these constructions all share a common semantic core. In all these languages, we have evidence for a functional degree morpheme whose conventional meaning is to introduce an asymmetric ordering between two degrees. On the other hand, where we do find variation is in the syntactic category of the comparative morpheme across languages. While in English this morpheme is an affix on the adjective (*-er*) or a particle (*more*), in Luganda this meaning is encoded in a verb.

In the next chapter, we will take a closer look at three particular phenomena as we develop a compositional analysis of exceed comparatives, both main verb and subordinate. In particular, we will examine in more detail the semantics of nominalized predicates, ambiguities that arise in certain cases, and the behavior of measure phrases.

Chapter 4

THE COMPOSITION OF LUGANDA EXCEED CONSTRUCTIONS

4.1   Introduction

In the previous chapter, it was shown that Luganda has both explicit and implicit comparison constructions: the two exceed constructions are both explicit comparisons, while the cleft construction is an implicit comparison strategy. The conclusion of this was that the exceed constructions make use of a semantic comparative operator, which I suggested should be the meaning of the exceed verb *-singa*. Additionally, we saw evidence that *-singa* comparatives have only phrasal standards, and not clausal ones. A formal analysis of exceed comparisons in Luganda will now be the focus of this chapter.

The main issues addressed in this chapter are the following:

1. What sort of semantics should we ascribe to exceed constructions?

2. Can main verb and subordinate exceed constructions be given a uniform semantic analysis?

In section 4.2, I develop some initial hypotheses about the answer to first question, drawing upon both the literature on phrasal comparatives, as well as the as of yet very small body of literature specifically devoted to exceed comparison in other languages. I propose an analysis for the exceed verb *-singa* as a three-place 'direct' comparison operator. In order to address the second question, we will need to take a closer look at one of most obvious differences between the two exceed constructions: in main verb exceed constructions, the exceed verb is the main predicate while the gradable predicate is in a nominalized form, while in subordinate exceed constructions, the gradable predicate is the main predicate and the exceed phrase is nominalized. Therefore, in section 4.3 I develop an analysis of nominalized gradable predicates. I propose that nominalized gradable predicates essentially denote a certain kind of relational noun. I discuss their distribution

both in comparatives and in possessive constructions. I propose that certain nominalizations involve movement of a silent degree operator, reminiscent of the standard analysis of *than*-clauses as wh-structures. The results of this section show that the main difference between main verb and subordinate exceed lies in the type of the argument that names the dimension: a gradable predicate or a relational noun. Additionally, there is evidence from possessive nominalizations that *-singa* can also have the meaning of a 2-place comparative operator. Then in section 4.4 I take up further issues in the semantic composition of subordinate exceed comparisons. I propose an analysis in terms of parasitic scope, a covert movement operation that is needed to derive gradable predicates at LF, and that can account for certain subordinate exceed constructions that are ambiguous. In section 6.2 I sketch out the landscape of measure phrases in positive and comparative constructions. Section 4.6 concludes by placing the analysis of comparisons in Luganda within the context of the discussion on semantic variation introduced in chapter 1.

4.2 Initial hypotheses

Recall the basic structures we are trying to account for. Exceed comparisons in Luganda come in two varieties: in (182), the verb *-singa* is the main verb of the sentence, while in (183) the main predicate is a gradable predicate, and the exceed-phrase appears in a subordinate (nominalized) form.

(182)   *Kizito **asinga**   Kato obukulu.*
        Kizito a-singa   Kato o-bu-kulu
        Kizito NC1-exceed Kato AUG-NC14-old
        'Kizito is older than Kato.'

        lit.: 'Kizito exceeds Kato in oldness.'   MAIN VERB EXCEED

(183)   *Kizito mukulu **okusinga**   Kato.*
        Kizito mu-kulu o-ku-singa   Kato
        Kizito NC1-old AUG-NC15-exceed Kato
        'Kizito is older than Kato.'

        lit.: 'Kizito is old exceeding Kato.'   SUBORDINATE EXCEED

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In the previous chapter, I argued that the comparative semantics should be encoded directly in the the verb -*singa* 'exceed'. The question remains as to how this should be done.

There are relatively few existing analyses of exceed comparison constructions in the literature for any language. Rather superficially, Beck et al. (2009) speculate that *exceed* in English is simply a transitive verb relating two individuals:

(184) a. Your expenses will always exceed your income.

b. $[\![\, exceed_{Eng} \,]\!] : \langle e, \langle e, t \rangle \rangle$ (Beck et al., 2009, p.21)

By contrast, they argue that for languages in their study that use exceed constructions as the primary means of comparison (i.e., Mooré and Yorùbá), the exceed verb should have a semantics parallel to English -*er/more* (see also Vanderelst, 2010; Howell, 2013, for Yorùbá). For instance, Vanderelst (2010) argues that exceed comparisons in Yorùbá like (185) are phrasal comparatives, and proposes a semantics for the exceed verb as in (186), where *x* and *y* are variables over individuals, and *G* is a variable over gradable predicates of type $\langle d, \langle e, t \rangle \rangle$:

(185) *Adé ga   ju   Isaac lọ.*
Adé be.tall exceed Isaac STANDARD.MARKER
'Adé is taller than Isaac.'   (Vanderelst, 2010, p.342)

(186) $[\![\, ju \,]\!] = \lambda x \lambda G \lambda y . \mathrm{max}(\lambda d. G(d)(y)) \succ \mathrm{max}(\lambda d'. G(d')(x))$

(adapted from Vanderelst, 2010, p.347)

As shown in (186), the exceed verb is analyzed as a 'direct' comparative operator (Heim, 1985; Kennedy, 1997; Merchant, 2009; Bhatt & Takahashi, 2007, 2011, among others). It directly compares two individuals with respect to some gradable property. By contrast, a reduction analysis of phrasal comparatives posits that the comparative operator takes two degree clauses as arguments (type $\langle d, t \rangle$ von Stechow, 1984; Heim, 1985; Kennedy, 1997; Lechner, 2001, among others). Superficially "phrasal" comparatives are then derived via ellipsis. Putting it differently, the semantics of the comparative operator in (186) is a 3-place operator, which has three argument positions,

while the clausal comparative operator is a 2-place operator, with only two argument positions (see discussion in chapter 2 for more details).[1]

We have already seen in the previous chapter that exceed comparisons in Luganda pass Kennedy's (2007a) tests for explicit comparison, indicating that we have evidence for a dedicated comparative morpheme along the lines of English *-er/more*. Furthermore, given that Luganda exceed comparisons have only phrasal standards, this suggests that *-singa* should also have an analysis of a three-place 'direct' comparison operator. Let us therefore take the semantics in (187) as the initial hypothesis for the semantics of the exceed verb in Luganda, following up on what I suggested at the end of chapter 3:

(187)   Preliminary analysis for *-singa* (to be revised)

$$\llbracket \text{-}singa \rrbracket = \lambda x \lambda G \lambda y . \max(\lambda d . G(d)(y)) \succ \max(\lambda d' . G(d')(x))$$

Given that Luganda exceed comparisons come in two syntactic varieties (182)-(183), we may wonder whether the semantics in (187) can be used for both types of exceed constructions. In particular, we may expect main verb and subordinate exceed to have different argument structures, since the latter contain gradable predicates while the former have nominalized gradable predicates. Depending on how this plays out, we would then have to say something about the effect of nominalization on the semantics of main verb versus subordinate exceed constructions. Finally, examples like (188) appear to require only a 2-place comparative operator, even though two phrasal constituents are directly compared (at least on the surface).

(188)   ***Obuwanvu***   ***bw'***   *emmeeza*   *businga*   ***obugazi***
        o-bu-wanvu   **bu-a**   **e-N-meeza**   bu-sing-a   **o-bu-gazi**
        AUG-NC14-long NC14-GEN AUG-NC9-table NC14-exceed-FV AUG-NC14-wide
        bwayo.
        bu-ayo
        NC14-POSS
        'The table's length exceeds its width.'

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1. When we include differential arguments, the phrasal and clausal comparative morphemes are 4- and 3-place operators, respectively.

On an intuitive level, sentences like (188) directly compare two phrases that name degrees. Such cases may require a revision of the 3-place operator analysis in (187).

In order to address these issues, I present an analysis of nominalized gradable predicates in the next section. I will propose that the semantics of the exceed verb in main verb exceed constructions like (182) can be modeled as in (187), modulo a difference in semantic type of the argument that names the dimension of comparison. However, I will also propose that sentences like (188) receive a straightforward analysis if we assume a 2-place operator, given the analysis of constituents like *obuwanvu bw'emmeeza* 'the length of the table' that I propose. Then in section 4.4, I present a compositionality puzzle for the analysis in (187), which I propose can be remedied by positing a covert movement operation at LF, following Nissenbaum (2000) and Barker (2007), among others.

4.3   The semantics of nominalized gradable predicates

An important issue that needs investigating in order to arrive at the correct analysis of exceed comparisons is the semantics that should be assigned to the nominalizations of gradable predicates like *bu-kulu* $\approx$ 'age/old-ness', which is derived from the adjective *-kulu* 'old'. The original preliminary analysis of *-singa*, repeated in (189) below, assumes that such nominalizations share the same semantic type as gradable predicates, i.e., $\langle d, \langle e, t \rangle \rangle$. Such an analysis allows *-singa* to have a uniform semantics and argument structure in both main verb and subordinate comparisons, and the composition of main verb exceed comparisons can proceed straightforwardly, as shown in (190)-(191):

(189)   Preliminary analysis for *-singa* (to be revised)

$[\![\text{ -}singa \text{ }]\!] = \lambda x \lambda G \lambda y.\max(\lambda d.G(d)(y)) \succ \max(\lambda d'.G(d')(x))$

(190)   *Kizito asinga Kato obukulu.*

'Kizito exceeds Kato in oldness.'

```
                              TP
                        ╱            ╲
                    DP                VP₂
                    │               ╱      ╲
                  Kizito         VP₁        DP
                              ╱      ╲       │
                            V        DP    obukulu
                            │         │
                         asinga      Kato
```
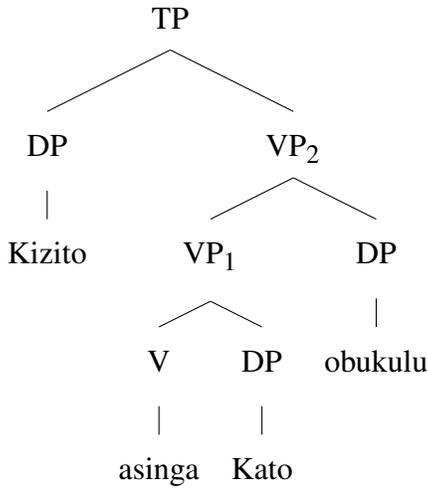
(191) a. $[\![\, asinga \,]\!] = \lambda x \lambda G \lambda y.\max(\lambda d.G(d)(y)) \succ \max(\lambda d'.G(d')(x))$

   b. $[\![\, obukulu \,]\!] = \lambda d \lambda x.\mathbf{old}(x) \succeq d$

   c. $[\![\, \text{VP}_1 \,]\!] = \lambda G \lambda y.\max(\lambda d.G(d)(y)) \succ \max(\lambda d'.G(d')(Kato))$

   d. $[\![\, \text{VP}_2 \,]\!] = \lambda y.\max(\lambda d.\mathbf{old}(y) \succeq d) \succ \max(\lambda d'.\mathbf{old}(Kato) \succeq d')$

   e. $[\![\, \text{TP} \,]\!] = \max(\lambda d.\mathbf{old}(Kizito) \succeq d) \succ \max(\lambda d'.\mathbf{old}(Kato) \succeq d')$

This analysis, however, ignores whatever semantic contribution that nominalization may have, if any, rendering it semantically vacuous. There are also difficulties with respect to the syntactic distribution of nominailzed gradable predicates, which is quite different from that of gradable adjectives.

Like other nouns, *bu-* nominals can appear in a possessive construction with the genitive marker *-a*. These possessive nominals can then appear in argument position, as shown in (192) and (193):

(192) **Obuzito**   **bwa**   **Kato** *bwamenye*   *entebe.*
        o-bu-zito   bu-a   Kato bu-a-menye   e-N-tebe
        AUG-NC14-heavy NC14-GEN Kato NC14-PST-break AUG-NC9-chair
        'Kato's weight/heaviness broke the chair.'

(193) **Obuwanvu**   **bw'**   *emmeeza*   *businga*   **obugazi**   **bwayo**.
        o-bu-wanvu   bu-a   e-N-meeza   bu-singa   **o-bu-gazi**   **bu-ayo**
        AUG-NC14-long NC14-GEN AUG-NC9-table NC14-exceed AUG-NC14-wide NC14-POSS
        'The table's length exceeds its width.'

In both (192) and (193), we observe that subject agreement on the verb is controlled by the NC14 nominalization. In certain cases, the nominalization can appear in argument position on its own, as shown in (194), where again we see the verb agreeing with the NC14 subject:

(194)   ***Obunafu***   *bubi.*
        o-bu-nafu   bu-bi
        AUG-NC14-lazy NC14-bad
        'Laziness is bad.'

In this section, I review previous literature on nominalizations of gradable predicates, and put forward a proposal for the semantics of *bu-* nominals in Luganda that accounts for their behavior in the various syntactic environments in which they are found.

4.3.1   *Previous work on nominalized gradable predicates*

There is relatively little literature on the semantics of nominalized gradable predicates that we can use as the starting point for the analysis of Luganda. Nevertheless, I review some recent attempts to characterize the meaning of nominals like *wisdom* and *happiness* in English, namely those of Nicolas (2004) and Moltmann (2009). I then consider the analysis of Francez & Koontz-Garboden (2012) for gradable predicates that are lexicalized as nouns in languages like Ulwa in order to see if this account can be generalized to Luganda nominalized predicates.

Nicolas (2004) analyses nominalizations like *wisdom* as relational nouns. Specifically, they relate an instance *x* of a property and a bearer *i* of that property. Thus, *wisdom* is given a semantics as in (195). Meanwhile, a constituent like *Julie's wisdom* denotes an individual, namely the particular instance of wisdom instantiated by Julie; see (196).

(195) $[\![wisdom]\!] = \lambda x \lambda i.\text{wisdom}(x,i)$ (Nicolas, 2004, p.201)

(196) $[\![Julie's\ wisdom]\!] = \iota x.\text{wisdom}(x,j)$ (adapted from Nicolas, 2004, p.202)

Moreover, Nicolas notes that nominalized gradable adjectives have a distribution similar to concrete mass nouns, for example in (197). He seeks to capture this similarity in a unified analysis

along the lines of (198)-(199), where μ is a measure function that gives the amount of its argument.

(197)   Julie has more {wine/wisdom} than Tom.

(198) $[\![$*Julie has more wine than Tom*$]\!] = 1$ iff

   $\exists x \exists v [\text{wine}(x) \ \& \ \text{has}(j,x) \ \& \ \text{wine}(v) \ \& \ \text{has}(t,v) : \mu(x) > \mu(v)]$

(adapted from Nicolas, 2004, p.203)

(199) $[\![$*Julie has more wisdom than Tom*$]\!] = 1$ iff

   $\exists x \exists v [\text{wisdom}(x,j) \ \& \ \text{wisdom}(v,t) : \mu(x) > \mu(v)]$

(adapted from Nicolas, 2004, p.203)

The truth conditions for (198) state that there is some wine that Julie has, and some wine that Tom has, and the amount of Julie's wine (given by the measure function μ) is greater than the amount of Tom's wine. Similarly, the truth conditions for (199) state that Julie instantiates some wisdom, and Tom instantiates some wisdom, and the amount of wisdom Julie has is greater than the amount of wisdom that Tom has.

   While this analysis formally captures some of the intuitive properties of nominalized gradable predicates, there are a few shortcomings that could be improved upon. First, there is no compositional analysis offered of the derivational process that transforms gradable adjective meanings to relational noun meanings of the sort in (195). This point is of particular importance to the Luganda cases, since the derivation of nominalizations from gradable adjectives is even more transparent in Luganda than it is in English.[2] Second, the measure function μ in (199) is completely divorced from the semantics of *wise* or *wisdom*. That is, there is no principled relation between μ and gradable adjective meanings. This is a rather odd feature of the analysis, since on the standard analysis, gradable predicates include such a measure function directly as part of their meaning (Kennedy,

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2. While the suffix *-ness* in English, as well as pairs like *wise-wisdom* show that such nominals are derived from gradable predicates, there are also cases of suppletion (e.g. *old-age*), as well as cases where gradable adjectives seem to be derived from property-denoting nouns (e.g. *beauty-beautiful*).

1997; Heim, 2001; Kennedy & McNally, 2005, among others). This also means that the truth conditions in (199) do not guarantee that μ will return a measurement along the dimension associated with *wise/wisdom*. Recognizing this difficulty, Nicolas stipulates two axioms that enforce a relation between μ and the relevant dimension.

Moltmann (2009) shares Nicolas' intuition that nominalizations in some sense refer to particular instances of properties. She claims that constituents like *John's happiness* refer to tropes, which are the manifestation of the predicate in an individual in a world *w* at a time *i*. This is formalized as in (200):

(200) $[\![John's\ happiness]\!]^{w,i} = $ f(John, happy, w, i) (Moltmann, 2009, p.60)

Moltmann takes great pains to argue that such possessive nominalizations denote tropes rather than degrees. First, she argues that degrees cannot be the object of perception or participate in causal relations, although tropes can. Her evidence comes from sentences like (201)-(202), where she takes measure phrases like *a hundred kilos* to denote degrees.

(201) a. I noticed John's weight.

       b. # I noticed a hundred kilos.

(202) a. John's weight caused the beam to break.

       b. # A hundred kilos caused the beam to break.

Nominalized gradable predicates in Luganda have similar properties, as shown in (203)-(204). Thus, it appears that constituents like *obuwanvu bwa Lydia* 'Lydia's height' in Luganda should receive an analysis similar to their English counterparts.

(203) ***Obuwanvu   bwa   Lydia** bwe   wunyisa.*
       o-bu-wanvu   bu-a   Lydia bu-e   wunyisa
       AUG-NC14-tall NC14-GEN Lydia NC14-CLEFT surprise
       'Lydia's height is surprising.'

(204) ***Obuzito***   ***bwa***   ***Kato*** *bwamenye*   *entebe.*
       o-bu-zito   bu-a   Kato bu-a-menye   e-N-tebe
       AUG-NC14-heavy NC14-GEN Kato NC14-PST-break AUG-NC9-chair

       'Kato's weight/heaviness broke the chair.'

However, there are some potential difficulties in taking this type of data as evidence against an analysis where constituents like *John's weight* denote degrees. First, it could be that measure phrases like *a hundred kilos* do not denote degrees after all. That is, taking these phrases as having equivalent semantic types could be mistaken. For instance, Schwarzschild (2005) argues that measure phrases actually denote predicates of sets of degrees (more on this below). Under such an analysis, it is unsurprising that measure phrases cannot appear in argument position, not only for verbs of perception and causation, but more generally as well:

(205) a. John's age is the reason I broke up with him.

       b. # 80 years is the reason I broke up with him.

(206) a. I am envious of John's weight.

       b. # I am envious of 80 kilos.

Furthermore, a constituent like *John's weight* can be replaced by a definite description of a degree. While some of the examples in (207) sound less natural than others, it is nevertheless the case that they seem to have less of a degraded status compared to Moltmann's # sentences with measure phrases.[3]

(207) a. I noticed the degree to which John is heavy.

       b. ?The degree to which John is heavy caused the beam to break.

       c. The degree to which John is heavy surprised me.

While it is not clear that such evidence can be taken to indicate that *John's weight* in fact denotes a degree, it is certainly interesting that replacement with a definite description of a degree is better

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3. Thanks to Itamar Francez for bringing up and discussing such examples with me.

than replacement with a measure phrase that is equal to John's weight. In any case, the data in (201)-(202) and (205)-(206) simply serve as evidence that *John's weight* and measure phrases are not of the same semantic type, rather than evidence that *John's weight* cannot denote a degree.

Like Nicolas' analysis, Moltmann's account isn't compositional, so the derivational relationship between gradable adjectives and nominalizations remains unclear.

Finally, Francez & Koontz-Garboden (2012) propose a semantics not for nominalized gradable predicates, but for gradable properties (= "property concepts" in their terminology) that are lexicalized directly as nouns in Ulwa. In a sense they aim to account for the opposite pattern that we are interested in here. In Ulwa, gradable properties are lexicalized as nouns, and extra morphology is added to turn them into predicate. Meanwhile in Luganda, gradable properties that are lexicalized as adjectives can take extra morphology to derive nominalizations. We may wonder, therefore, whether nominal property concepts in Ulwa share the same semantics as Luganda nominalizations of gradable predicates.

Under Francez & Koontz-Garboden's analysis, property concept nouns in Ulwa denote not predicates of individuals, but predicates of portions, as in (208), where *p* is a variable for portions. The possessive morpheme *-ka* transforms the property concept root into a predicate of individuals, as in (209). In prose, (209) denotes a property of individuals that stand in the possession (π) relation to some portion of dirtiness, given a contextually-supplied domain restriction *D*, which supplies only portions that are above some contextually salient standard.

(208) $[\![minish]\!] = \lambda p.\mathbf{dirtiness}(p)$

(209) $[\![minish\text{-}ka]\!] = \lambda x \lambda D.\exists z^D [\mathbf{dirtiness}(z) \ \& \ \pi(x,z)]$

<div align="right">(Francez & Koontz-Garboden, 2012, p.18)</div>

As we have already seen in the previous chapter, Luganda also has a class of property concept nouns that require the presence of genitive morphology to be used in predicative position, as shown in (210). I proposed that these cases be analyzed on par with property concept nouns in Ulwa.

(210) *Kizuule wa   mazima.*
       Kisuule o-a   ma-zima
       Kisuule NC1-GEN NC6-truth
       'Kisuule is honest.'

There is, however, a difference in distribution between this type of noun that names a property concept and nominalized gradable predicates, specifically with respect to their behavior in main verb exceed constructions. While nominalized gradable predicates can appear on their own as adjuncts, property concept nouns require the genitive marker and the copula in a nominalized form to appear in this position, as shown in (211).

(211) *Kisuule asinga   Ryan *(okuba   ow')   amazima.*
       Kisuule a-singa   Ryan *(o-ku-ba   o-o-a)   a-ma-zima
       Kisuule NC1-exceed Ryan AUG-NC15-COP AUG-NC1-GEN AUG-NC6-truth
       'Kisuule is more honest than Ryan.'

       ('Kisuule exceeds Ryan in being honest.')

Thus, it appears that the analysis of property concept nouns cannot be carried over directly to account for the semantics of nominalized gradable predicates in Luganda as well. These also require further nominalization, just like lexical gradable adjectives and verbs in this language. In what follows, I propose an analysis of such nominalizations that takes into account certain insights of the proposals summarized here, while also avoiding some of their observed shortcomings.

4.3.2   An analysis of possessive and non-possessive adjective nominalizations

In this section, I develop an analysis for the semantics of nominalized gradable adjectives like *bukulu* 'age/oldness'. In doing so, my strategy will be to deduce the semantics of such nominalizations by working backwards from an intuitive analysis of possessive nominalizations, a semantics for the possessive (genitive) morphology, and the semantics of gradable adjectives from which these nominalizations are derived.

Let us first assume, contra Moltmann (2009), that possessive nominalizations like *obuwanvu*

bwa Lydia 'Lydia's height' do in fact denote degrees. Specifically, they denote the maximal degree to which an individual holds a property, as modeled in (212):

(212) $[\![\,obuwanvu\ bwa\ Lydia\,]\!] = \max(\lambda d.\text{Lydia is } d-\text{tall})$

Recall, however, the data in (201)-(202) and (205)-(206) that Moltmann used to argue that possessive nominalizations cannot denote degrees. The observation was that if a phrase like *John's height* named the degree to which John is tall, it is surprising that such a constituent cannot be substituted by a measure phrase such as five feet if John is five feet tall. Moltmann uses these facts as an argument that possessive nominalizations cannot denote degrees. However, this argument was based on the assumption that measure phrases denote degrees, which has recently been challenged in the literature. In particular, Schwarzschild (2005) argues that measure phrases denote predicates of sets of degrees, along the lines of (213):[4]

(213) $[\![\,five\ feet\,]\!] = \lambda D_{\langle d,t \rangle}.5\text{feet}(D)$

The semantics in (213) states that *five feet* is a predicate of a gap, which Schwarzschild views as a set of degrees,[5] which returns true if the measure of that gap is five feet. Taking (213) as the semantics for measure phrases can then explain the data in (201)-(202) and (205)-(206), while maintaining an analysis whereby possessive nominalizations denote a degree. Measure phrases cannot replace nominalizations like *John's height* because they denote different things.

An analysis of possessive nominalizations as denoting degrees has an immediate consequence for the analysis of exceed comparisons like (214), where such nominalizations serve as both arguments of the exceed verb. The truth conditions of (214) are given in (215), where the exceed verb has the semantics in (216).

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4. See Grano & Kennedy (2012) and the discussion in section 6.2 for problems and arguments against this view.

5. Schwarzschild in fact creates a new basic type, interval, which he conceives as a set of degrees. More on this in section 6.2.

(214) **_Obuwanvu_**   **_bw'_**   **_emmeeza_**   **_businga_**   **_obugazi_**   **_bwayo_**.
o-bu-wanvu   bu-a   e-N-meeza   bu-singa   o-bu-gazi   bu-ayo
AUG-NC14-long NC14-GEN AUG-NC9-table NC14-exceed AUG-NC14-wide NC14-POSS

'The table's length exceeds its width.'

(215) $[\![\,(214)\,]\!] = \max(\lambda d.\text{the table is } d-\text{long}) \succ \max(\lambda d'.\text{the table is } d'-\text{wide})$

(216) $[\![\,\text{-}singa_{Deg}\,]\!] = \lambda d \lambda d'.d' \succ d$

In this version of the comparative morpheme, the exceed verb simply compares two degrees directly. Here, we note that the semantic definition of 'individual' versus 'degree' comparison cross-cuts the syntactic division of 'phrasal' versus 'clausal' comparison. The constituents compared denote degrees, but are syntactically phrasal constituents, i.e., DPs. That is, while degree comparison is typically taken to be synonymous with clausal comparison, here we see evidence that a 2-place comparative operator that nevertheless involves phrasal comparison rather than clausal comparison.[6] What this shows is that the semantic aspect of two-place versus three-place comparative operators (borrowing the terminology of Bhatt & Takahashi 2007, 2011) cross-cuts the phrasal versus clausal distinction, which is a syntactic distinction. That a language like Luganda should still have access to both a two-place and a three-place comparative morpheme is perhaps not surprising, since the two meanings are clearly related. In fact, as shown by Kennedy (2007a), the semantics of the three-place operator can be stated in terms of the two-place operator, as shown in (217):

(217) $[\![\,\text{-}singa_{3-place}\,]\!] = \lambda y \lambda G \lambda x.[\![\,\text{-}singa_{Deg}\,]\!](\max(\lambda d'.G(d')(y)) = 1)(G)(x)$

In order to account for the semantics of possessive nominalizations, I will adopt an analysis of possessives in the style of Barker (1995). I sketch Barker's syntax and semantics for the English

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6. Similar conclusions are reached by Beck et al. (2009) and Vanderelst (2010) for exceed comparison in Yorùbá, on the basis of slightly different facts involving measure phrase standards. Such examples in Luganda will be discussed later.

possessive *John's table* below. In this analysis, the genitive *'s* is semantically vacuous, while the possessive relation is introduced by the null morpheme POSS, which combines with the head noun.

(218)

$$
\begin{array}{c}
\text{DP}_2 \\
\diagup \diagdown \\
\text{DP}_1 \quad\quad \text{D}' \\
\mid \quad\quad \diagup \diagdown \\
\text{John's} \quad \text{NP} \quad \text{D} \\
\mid \quad\quad \mid \\
\text{table} \quad \text{POSS}
\end{array}
$$
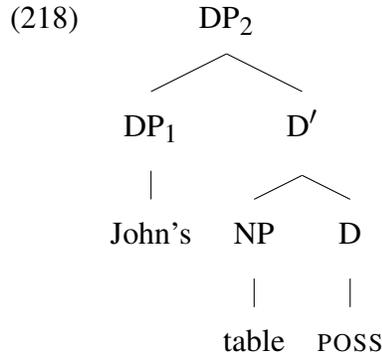
(219)   a. $[\![\,\text{DP}_1\,]\!] = j$

   b. $[\![\,\text{NP}\,]\!] = \lambda x.\textbf{table}(x)$

   c. $[\![\,\text{POSS}\,]\!] = \lambda P \lambda y \lambda z.\pi(y,z) \ \& \ P(z)$

   d. $[\![\,\text{D}'\,]\!] = [\![\,\text{POSS}\,]\!]([\![\,\text{NP}\,]\!]) = \lambda y \lambda z.\pi(y,z) \ \& \ \textbf{table}(z)$

   e. $[\![\,\text{DP}_2\,]\!] = [\![\,\text{D}'\,]\!]([\![\,\text{DP}_1\,]\!]) = \lambda z.\pi(j,z) \ \& \ \textbf{table}(z)$

The result of the derivation is a possessive DP that denotes a property of individuals z that is true iff John stands in the possession relation to z, and z is a table.

   Barker analyzes inherently relational nouns such as *child* not as denoting predicates, but two-place relations. The syntax of possessive DPs like *John's child* remains the same as in (218), but since the kinship relation is lexically encoded in the head noun, the POSS morpheme simply denotes an identity function on relations R:

(220)   a. $[\![\,child\,]\!] = \lambda x \lambda y.\textbf{child}(x,y)$

   b. $[\![\,\text{POSS}\,]\!] = \lambda R.R$

   c. $[\![\,John's\ child\,]\!] = \lambda y.\textbf{child}(j,y)$

In this case, the possessive DP denotes a predicate of individuals y that is true iff y is John's child.

   To carry over this analysis to Luganda, I build off the intuitions of Nicolas (2004) and Molt-mann (2009) that nominalized gradable predicates are relational. Specifically, I propose that such

nominalizations denote relations between individuals and degrees. I follow Barker's syntax for possessive DPs as shown in (221), and propose that the genitive particle *-a* is the overt exponent of the POSS morpheme.[7] The derivation of the possessive nominalization *obuwanvu bwa Lydia* 'Lydia's height' then proceeds as in (222). Since the head noun of the possessive phrase is inherently relational, the semantic contribution of *-a* qua POSS is identity.

(221)

$$
\begin{array}{c}
\text{DP}_2 \\
\diagup \diagdown \\
\text{D}' \qquad \text{DP}_1 \\
\diagup \diagdown \qquad | \\
\text{NP} \qquad \text{D} \quad \text{Lydia} \\
| \qquad | \\
\text{obuwanvu} \quad \text{bu-a}
\end{array}
$$
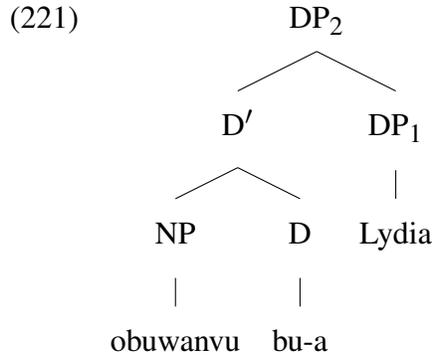
(222) a. $[\![\, obuwanvu \,]\!] = \lambda x \lambda d.\textbf{height}(x) \succeq d$

   b. $[\![\, \text{-}a \,]\!] = \lambda R.R$

   c. $[\![\, obuwanvu\ bwa \,]\!] = \lambda x \lambda d.\textbf{height}(x) \succeq d$

   d. $[\![\, obuwanvu\ bwa\ Lydia \,]\!] = \lambda d.\textbf{height}(l) \succeq d$

The result of the derivation is a predicate of degrees d that is true of d iff d is a degree to which Lydia is tall. In order to unify this analysis with the "intuitive" analysis of possessive nominalizations in (212), we need to assume a maximality operator that applies to a predicate of degrees and returns the maximal degree in the range of the function; see (223). That maximality should be associated with such expressions is desirable in view of sentences like (224), repeated from above, where intuitively it is Lydia's maximal degree of height that is surprising, and not any smaller degrees of height.[8]

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7. While I follow Barker's syntactic analysis for possessives, I am not necessarily committed to the view that the genitive particle in Luganda is actually a determiner.

8. While the addition of the maximality operator may seem like too much of a stipulation here, we could perhaps motivate maximality in terms of the definiteness of the possessive.

(223) $\llbracket\, obuwanvu\ bwa\ Lydia\,\rrbracket = \max(\lambda d.\textbf{height}(l) \succeq d)$

(224) *Obuwanvu*   *bwa*   *Lydia bwe*   *wunyisa.*
      o-bu-wanvu   bu-a   Lydia bu-e   wunyisa
      AUG-NC14-tall NC14-GEN Lydia NC14-CLEFT surprise
      'Lydia's height is surprising.'

Now that we have an analysis for nominalized gradable predicates, we can think about the effect of nominalization on gradable predicates. Recall the analysis of gradable predicates we are assuming is also relational, relating an individual with their degree of height:

(225) $\llbracket\, \textit{-wanvu}\,\rrbracket = \lambda d\lambda x.\textbf{height}(x) \succeq d$

Comparing (225) to the semantics of nominalizations proposed in (222), we see that nominalization preserves the relational meaning of gradable predicates, but alters the argument structure of the relation. This seems right. In the case of the adjectival meaning, we first need to do something with the degree argument to arrive at a predicate of individuals. In the case of nominalizations, however, we saturate the first argument with the "possessor" of the property, and arrive at a set of degrees to which that individual holds that property. The semantics associated with this nominalization process is given in (226):

(226) $\llbracket\, \text{NLMZ}\,\rrbracket = \lambda G_{\langle d,\langle e,t\rangle\rangle}\lambda x\lambda d.G(x,d)$

Applying this analysis to main verb exceed comparisons is now fairly straightforward. We can simply adapt our original hypothesis for the meaning of *-singa* by altering the semantic type of the non-individual argument of the verb, as in (227). Instead of expecting a gradable adjective of type $\langle d,\langle e,t\rangle\rangle$, the verb now expects a nominalized gradable predicate meaning of type $\langle e,\langle d,t\rangle\rangle$ instead.

(227) Main verb exceed:

$\llbracket\, \textit{-singa}\,\rrbracket = \lambda x_{\langle e\rangle}\lambda H_{\langle e,\langle d,t\rangle\rangle}\lambda y_{\langle e\rangle}.\max(\lambda d.H(y,d)) \succ \max(\lambda d'.H(x,d'))$

There is yet one more environment where we find nominalizations, and that is in argument position, as in (228):

(228) *Obunafu   bubi.*
       o-bu-nafu   bu-bi
       AUG-NC14-lazy NC14-bi
       'Laziness is bad.'

I do not have a fully-developed analysis for this use of nominalizations at this point, but I will describe what an analysis should do. What we need is a way to get from the $\langle e, \langle d, t \rangle \rangle$ meaning to one that can be used as the argument of a predicate. We could achieve this by invoking some sort of type shifting operation. One possibility would be some version of the $^{\cap}$-operator a la Chierchia (1998), which would result in a meaning for *obunafu* something along the lines of "the kind of thing that is a degree of laziness". Such a meaning would likely need to be contextually restricted somehow to make sure that such a degree is above some salient threshold in order to ensure that some minimal degree of laziness does not satisfy such a description. Alternatively, a maximality or iota operator could be used to return the maximal degree of laziness relativized to some contextually salient individual. There is perhaps a way to unify this use of nominalized gradable predicates with mass nouns more generally, but I leave this possibility open for future work.

4.3.3   Nominalized verb phrases

Adjectives are not the only constituents that can appear nominalized in main verb exceed constructions. Verb phrases containing the dimension of comparison can also be nominalized, as in (229). Assuming we want to maintain a unified analysis for both main verb *-singa* as in (227), and also for the semantic type of nominalizations, the interpretation of the nominalized constituent should be something along the lines of (230).

(229) *Charlotte yasinga*   *Rita okuwandiika*   *amabaluwa*   *amangi.*
     Charlotte a-a-singa   Rita o-ku-wandiika   a-ma-baluwa   a-ma-ngi
     Charlotte NC1-PST-exceed Rita AUG-NC15-write AUG-NC6-letter AUG-NC6-many

     'Charlotte wrote more letters than Rita.'

(230) $[\![$ *okuwandiika amabaluwa amangi* $]\!] = \lambda x \lambda d.x$ writes d-many letters

(231) $[\![$ (229) $]\!] = \max(\lambda d.\text{C wrote } d\text{-many letters}) \succ \max(\lambda d'.\text{R wrote } d'\text{-many letters})$

Under such an analysis, we arrive at the intuitively correct truth conditions for sentences like (229), as shown in (231). However, it is unclear how and why the nominalized verb phrase receives the interpretation in (230).

As a first step towards understanding the semantics of constituents like (230), let us assume that *amangi* 'many' in (229) (or rather the adjective root *-ngi*) has the semantics in (232), following Hackl (2001) for English *many*:

(232) $[\![$ *-ngi* $]\!] = \lambda d \lambda x.|x| = d$

Like other gradable predicates, it requires degree morphology to saturate or bind the degree argument.

Second, I propose that that a null degree operator *Op* is generated as the sister of *amangi*. *Op* then undergoes movement to a higher position in order to create a degree predicate. This operator is akin to the comparative wh-operator proposed for English *than*-clauses (Chomsky, 1977; Kennedy, 1997; Heim, 2001, see discussion in chapter 2). Some indirect evidence that such constituents are wh-structures comes from English, where an overt wh-phrase may appear in parallel exceed comparisons as in (233). For more evidence, see chapter 2.

(233) Charlotte exceeded Rita in how many letters they wrote.

Prototypical wh-movement takes place in full clauses, where the wh-element lands in the Spec,CP position. However, nominalizations like (230) are not nominalizations of full clauses, but of something smaller. Given that there is no tense marking on the nominalized verb, I assume

that we are dealing with a *v*P or VP constituent. I follow Pancheva (2009) in allowing for this type of movement within a small clause constituent. Pancheva analyzes a subset of apparently phrasal comparatives in Slavic as having an underlying small clause structure in the *than*-constituent. Under her analysis, a wh-operator moves to the edge of a small clause predicate (e.g. *v*P) to create a predicate of degrees. The standard also moves to receive genitive case from the standard marker (in the style of Merchant (2009) for Greek), while the rest of the small clause is elided under identity with material in the matrix clause. The *than*-constituent of the Polish phrasal comparative in (234) thus receives the syntactic analysis in (235):

(234) *Marek zwiedził więcej miejsc od   Anny.*
       Marek visited   more   places from Anna.GEN
       'Marek visited more places than Anna.'   (Pancheva, 2009, p. 4)

(235) *od* [$_{PredP}$ Anna$_1$ [$_{vP}$ wh$_2$ [$_{vP}$ x$_1$ visit d_2-many places]]]   (Pancheva, 2009, p. 9)

I essentially want to analyze nominalized verb phrases in exceed comparisons in a similar way, with a couple of twists on Pancheva's implementation. Like Pancheva, I propose movement of the degree wh-operator to the edge of *v*P. However, I also leave the individual argument unsaturated, resulting in a predicate as in (236):

(236) ⟦ [$_{vP}$ *Op$_1$x* write d_1-many letters] ⟧ $= \lambda d \lambda x.x$ write d-many letters

This constituent now has the meaning of a gradable predicate, parallel to *-wanvu* 'tall' in (225). It denotes a relation between individuals and the amount of letters they wrote. As in the case of adjectives, nominalization of this gradable predicate results in a change in argument structure and semantic type: from $\langle d, \langle e,t \rangle \rangle$ to $\langle e, \langle d,t \rangle \rangle$. The meaning for *-singa* in (227) can now be applied to comparatives like (229) in a straightforward way.

The movement-based account proposed here makes the prediction that a configuration that blocks such wh-movement should result in ungrammaticality, or at the very least constrain what readings are available to grammatical strings. Constraints on movement were also invoked by

Chomsky (1977) as evidence for the wh-operator analysis of clausal comparatives in English. This prediction appears to be upheld in Luganda. Consider the main verb exceed construction in (237), where the gradable predicate *abangi* 'many' is embedded in a relative clause within the nominalization (where the relative clause is demarcated by square brackets). While this comparative is grammatical, it cannot have an amount comparison reading.

(237)   *Charlotte yasinga*   *Rita okusoma*   *ebbaluwa*   [*Lydia gye*
         Charlotte a-a-singa   Rita o-ku-soma   e-C-baluwa   Lydia gi-e
         Charlotte NC1-PST-exceed Rita AUG-NC15-read AUG-NC9-letter Lydia NC9-REL
         yawereza   *abantu*   *abangi*].
         a-a-wereza   a-ba-ntu   a-ba-ngi
         NC1-PST-send AUG-NC2-person AUG-NC2-many

     a.   OK: $\max(\lambda d.$Charlotte read a letter $d-$often that Lydia sent to many people$) \succ \max(\lambda d'.$Rita read a letter $d'-$often that Lydia sent to many people$)$

     b.   * $\max(\lambda d.$Charlotte read a letter that Lydia sent to $d-$many people$) \succ \max(\lambda d'.$Rita read a letter that Lydia sent to $d'-$many people$)$

The intended interpretation in (237b) is one where the number of people to whom Lydia sent the letter that Charlotte read exceeds the number of people to whom Lydia sent the letter that Rita read. For such an interpretation to be possible, the degree operator would need to be generated within the relative clause as a sister to *abangi* 'many', and move to the edge of the nominalized *v*P. However, since relative clauses are islands to movement, this interpretation for (237) is not possible.

The interpretation in (237a) does not suffer this fate. This interpretation is based on how often Charlotte and Rita read some letter, which Lydia happened to send to many people. The relevant reading can be made explicit by adding the phrase *emirundi mingi* 'many times' as in (238). In this case, the degree wh-operator is generated as the sister to *mingi*, which is not embedded in the relative clause.

(238) *Charlotte yasinga*   *Rita okusoma*   *ebbaluwa*   *emirundi*
       Charlotte a-a-singa   Rita o-ku-soma   e-C-baluwa   e-mi-rundi
       Charlotte NC1-PST-exceed Rita AUG-NC15-read AUG-NC9-letter AUG-NC4-time
       mingi   [*Lydia gye*   *yawereza*   *abantu*   *abangi*].
       mi-ngi   Lydia gi-e   a-a-wereza   a-ba-ntu   a-ba-ngi
       NC4-many Lydia NC9-REL NC1-PST-send AUG-NC2-person AUG-NC2-many
       'Charlotte exceeds Rita in reading many times a letter that Lydia sent to many people.'

Thus, the degree operator movement account is able to predict the availability of readings of main verb exceed comparisons. The movement of the degree operator derives a gradable predicate in syntax, but this movement is subject to familiar restrictions on movement more generally.

4.3.4   Summary

I have proposed an analysis for possessive and non-possessive nominalized predicates that appear in main verb exceed comparatives. Nominalization in this context involves changing the order of argument saturation of the relation denoted by the gradable predicate. The result is a relational noun that can enter into a possessive construction along the lines of Barker (1995). Possessive nominalizations denote degrees and can appear directly as the arguments of the exceed verb. In this case, specification of a dimension is not necessary, since the compared degrees are maximal degrees along a dimension that is encoded in the degree description.

The analysis also assigns nominalized verb phrases in main verb exceed constructions the same semantic type as nominalized adjectives. While gradable adjectives inherently lexicalize relations between individuals and degrees, in the case of nominalized verb phrases, movement of a degree operator creates a gradable predicate in syntax, which then undergoes the same nominalization operation as gradable adjectives. The result is that the same comparative morpheme can be used for main verb exceed constructions with nominalized adjectives and verb phrases.

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4.4 The composition of subordinate exceed comparatives

We now turn to subordinate exceed comparatives like (239), repeated from above, and ask whether the same comparative morpheme(s) that were proposed in the previous section can be applied to these cases as well.

(239) *Kizito mukulu okusinga   Kato.*
Kizito mu-kulu o-ku-singa   Kato
K.   NC1-old AUG-NC15-exceed K.
'Kizito is older than Kato.'

lit.: 'Kizito is old exceeding Kato.'

Cases such as these can in fact be easily handled by the direct phrasal comparative morpheme that we started out with as our initial hypothesis in (187). The derivation for (239) under this analysis is shown in (240)-(241).

(240)

```
                    TP
           ┌─────────┴─────────┐
         DP₃                  AP₂
          │            ┌───────┴───────┐
        Kizito       AP₁             DP₂
                      │         ┌──────┴──────┐
                   mukulu     AUG           NP
                              │        ┌─────┴─────┐
                             o-   ku-            VP
                                            ┌─────┴─────┐
                                           V          DP₁
                                           │           │
                                        -singa       Kato
```
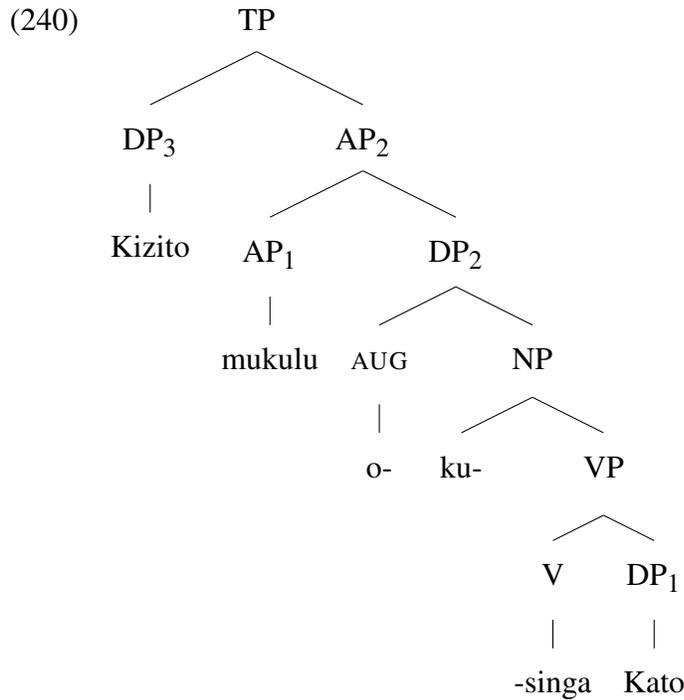
(241)   a. $[\![\ \text{-}singa\ ]\!] = \lambda x \lambda G \lambda y.\max(\lambda d.G(d)(y)) \succ \max(\lambda d'.G(d')(x))$

b. $[\![\ \text{DP}_2\ ]\!] = \lambda G \lambda y.\max(\lambda d.G(d)(y)) \succ \max(\lambda d'.G(d')(Kato))$

c. $[\![\, mukulu \,]\!] = \lambda d \lambda x.\mathbf{old}(x) \succeq d$

d. $[\![\, \text{AP}_2 \,]\!] = \lambda y.\max(\lambda d.\mathbf{old}(y) \succeq d) \succ \max(\lambda d'.\mathbf{old}(Kato) \succeq d')$

e. $[\![\, \text{TP} \,]\!] = \max(\lambda d.\mathbf{old}(Kizito) \succeq d)) \succ \max(\lambda d'.\mathbf{old}(Kato) \succeq d')$

Such an analysis derives the correct truth conditions for (239). The comparative morpheme gets all of its arguments in the right order, and the semantics can be read directly off the surface syntax. The only difference between this use of the exceed verb and the revised one proposed for main verb exceed in (227) is in the semantic type of the constituent naming the dimension of comparison: here, it is a regular gradable predicate meaning of type $\langle d, \langle e, t \rangle \rangle$, while in the previous section it needed to be a nominalized gradable predicate meaning of type $\langle e, \langle d, t \rangle \rangle$.[9]

Getting the right truth conditions for comparatives like (242), however, is less straightforward on this account.

(242)   *Charlotte yawandiika   amabaluwa   mangi   okusinga   Rita.*
        Charlotte a-a-wandiika   a-ma-baluwa   ma-ngi   o-ku-singa   Rita
        Charlotte NC1-PST-write AUG-NC6-letter NC6-many AUG-NC15-exceed Rita
        'Charlotte wrote more letters than Rita.'

Intuitively, to arrive at the correct truth conditions for (242), what we need is for the comparative morpheme to combine with a gradable predicate that relates individuals to the amount of letters they wrote. However, the relevant gradable predicate does not exist in the surface syntax, assuming that, on analogy with (240), the *okusinga* phrase is generated as an adjunct to the AP headed by the gradable predicate *mangi* 'many'. Thus, in order to maintain the direct comparison analysis of *-singa*, we need way of deriving the relevant gradable predicate that the comparative morpheme is looking for.

Further evidence that some covert structure is needed to handle subordinate exceed constructions comes from the existence of certain ambiguities that such sentences can give rise to. For

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9. I leave open the possibility that a more unified analysis is possible, namely where both gradable adjectives and their nominalizations directly denote measure functions of type $\langle e, d \rangle$, along the lines of Kennedy (1997, 2007c).

instance, (243) has two possible readings, depending on which DP is taken to be the target of comparison.

(243) *Kizito yalaba   omuti   okusinga   embwa.*
Kizito a-a-laba   o-mu-ti   o-ku-singa   e-N-bwa
K.   NC1-PAST-see AUG-NC3-tree AUG-NC15-exceed AUG-NC9-dog

   a. 'Kizito saw the tree more than the dog (saw the tree).'

       $= \max(\lambda d.\text{Kizito saw the tree } d-\text{much}) \succ \max(\lambda d'.\text{the dog saw the tree } d'-\text{much})$

   b. 'Kizito saw the tree more than (he saw) the dog.'

       $= \max(\lambda d.\text{Kizito saw the tree } d-\text{much}) \succ \max(\lambda d'.\text{Kizito saw the dog } d'-\text{much})$

On the reading in (243a), the target of comparison is Kizito, and what is being compared is how much he and the dog both saw some tree. The relevant gradable property on this reading is a relation between individuals and their amount of tree-seeing. On the second reading in (243b), the target of comparison is the tree. The relevant gradable property on this reading is a relation between individuals and their amount of being seen by Kizito. Such data serves as further evidence that some amount of covert strurcture is required to derive two distinct gradable predicates that correspond to these two readings.

I propose that these two issues can be resolved by appealing to an LF movement operation, namely parasitic scope. This variant of quantifier raising (QR) was developed by Nissenbaum (2000) to deal with the interpretation of parasitic gaps. It has since been further exploited by Barker (2007) to account for the interpretation of the adjective *same*, and by Kennedy & Stanley (2009) for the semantics of *average*. Additionally, Merchant (2009) has argued that parasitic scope analysis may be used to derive island sensitivities in Greek phrasal comparatives, while Bhatt & Takahashi (2007, 2011) develop an analysis for phrasal comparatives in Hindi based on parasitic scope (see discussion in chapter 2).

The proposed analysis for Luganda subordinate exceed constructions involves the covert movement of the target of comparison and the *okusinga* phrase in order to derive the relevant gradable predicates at LF. First, the target of comparison raises, creating a new node at LF that marks the

scope of the raised DP (cf. Heim & Kratzer, 1998). Then, the *okusinga* phrase raises to an inter-mediate position between the raised DP and its scope target. That is, this movement is parasitic on the movement of the target of comparison. This operation has the effect of deriving a gradable predicate at LF that can then serve as an argument of the exceed verb.

Let us first consider the composition of the comparative in (242), whose surface syntax is represented in (244). From this configuration, the target of comparison, here *Charlotte*, moves, creating a new node marking its scope. Next, the *okusinga* phrase raises and 'tucks in' between *Charlotte* and its scope-taking position. The resulting configuration is shown in (245), along with the derivation of the truth conditions.[10]

(244)

```
                    TP
            _____|_____
           DP                VP
           |            _____|_____
        Charlotte      V             DP
                       |         _____|_____
                  yawandiika    NP          AP
                                |        ___|___
                            amabaluwa   AP      DP
                                        |      /  \
                                      mangi  okusinga Rita
```

_____
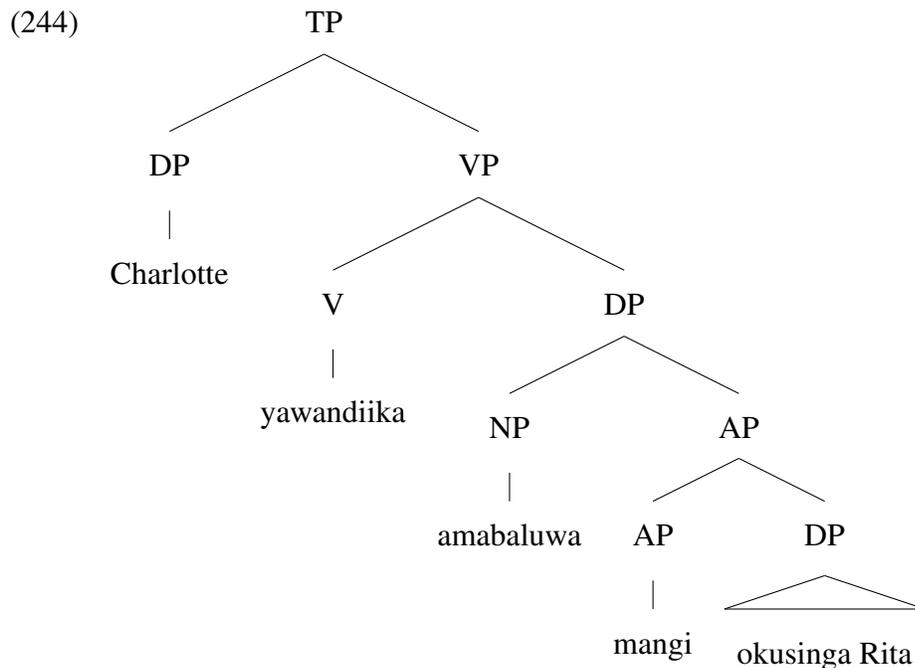
10. Going forward, I label the *okusinga* phrase as a DP without decomposing its internal structure; see (240) for the full structure I assume.

(245)

```
                              TP₅
                   ╱                    ╲
              DPᵢ                         TP₄
               │                 ╱                 ╲
           Charlotte         DPⱼ                     TP₃
                          ╱      ╲              ╱           ╲
                    okusinga Rita   λd        TP₂
                                          ╱              ╲
                                        λx                 TP₁
                                                      ╱            ╲
                                          tᵢ yawandiika amabaluwa mangi tⱼ
```
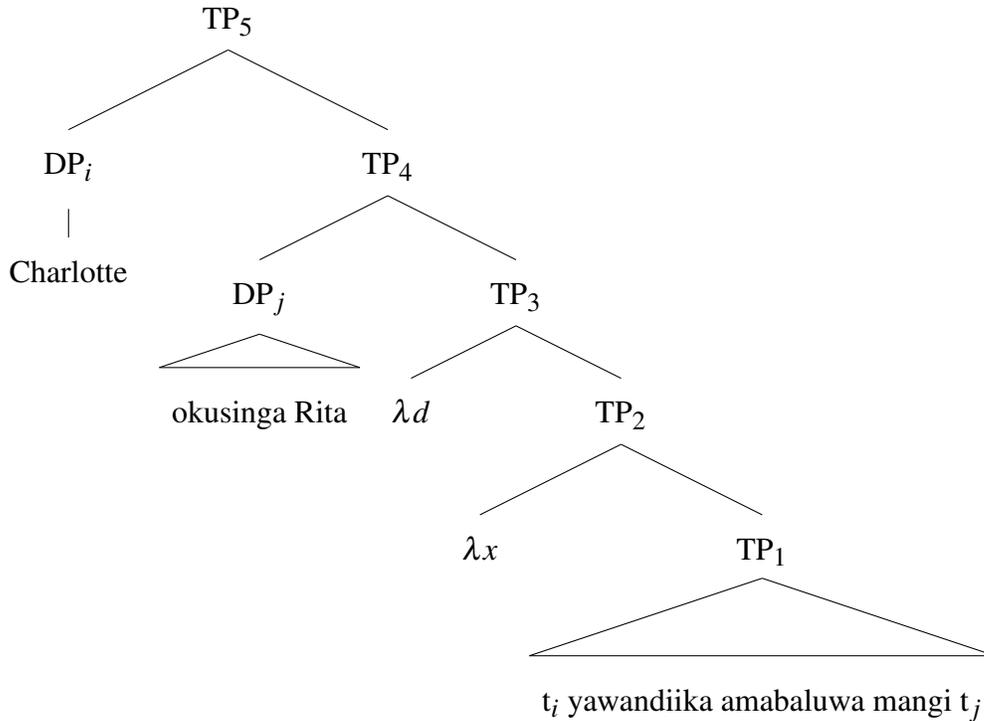
(246)   a. $⟦\,okusinga\,⟧ = \lambda x \lambda G \lambda y.\max(\lambda d.G(y)(d)) \succ \max(\lambda d'.G(x)(d'))$

b. $⟦\,DP_j\,⟧ = \lambda G \lambda y.\max(d.G(y)(d)) \succ \max(\lambda d'.G(\text{Rita})(d'))$

c. $⟦\,TP_3\,⟧ = \lambda d \lambda x.x$ write $d-$many letters

d. $⟦\,TP_4\,⟧ = \lambda y.\max(\lambda d.y$ write d-many letters$) \succ \max(\lambda d'.\text{Rita}$ write d'-many letters$)$

e. $⟦\,TP_5\,⟧ = \max(\lambda d.\text{Charlotte}$ write d-many letters$) \succ \max(\lambda d'.\text{Rita}$ write d'-many letters$)$

The movement of the target and *okusinga* phrase are needed in order to make sure that the comparative morpheme can combine with all its arguments. In particular, the gradable predicate upon which the comparison is based is not available in the surface syntax, and must be derived through movement at LF. Once these movements have taken place, however, the semantic composition is straightforward.

This analysis can explain the ambiguities that are present in sentences like (243). The two readings arise based on the choice of target, which raises to the highest scope position. The reading in (243a) is derived by first raising *Kizito* to the highest scope position, with the *okusinga* phrase

raising to the intermediate position. By contrast, the reading in (243b) is derived when *omuti* takes the highest scope. These two configurations, and their respective semantic interpretations, are shown in (247)-(250):

(247)   Reading 1 - (243a):
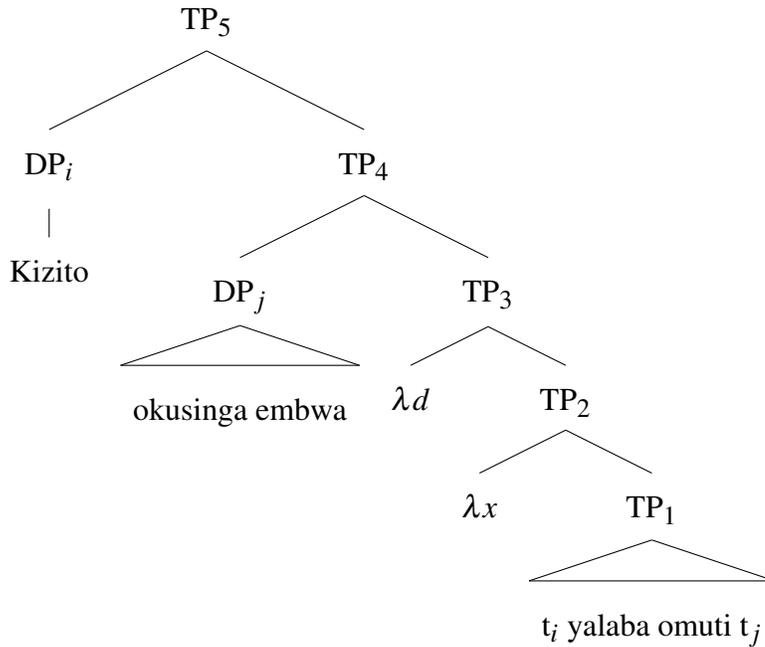
(248)   a. $[\![\,okusinga\,]\!] = \lambda x \lambda G \lambda y.\max(\lambda d.G(y)(d)) \succ \max(\lambda d'.G(x)(d'))$

b. $[\![\,DP_j\,]\!] = \lambda G \lambda y.\max(d.G(y)(d)) \succ \max(\lambda d'.G(\text{the.dog})(d'))$

c. $[\![\,TP_3\,]\!] = \lambda d \lambda x.x$ see the tree $d-$much

d. $[\![\,TP_4\,]\!] = \lambda y.\max(\lambda d.y$ see the tree $d-$much$) \succ \max(\lambda d'.$the dog see the tree $d'-$much$)$

e. $[\![\,TP_5\,]\!] = \max(\lambda d.$ Kizito see the tree $d-$much$) \succ \max(\lambda d'.$the dog see the tree $d'-$much$)$

(249)   Reading 2 - (243b):

TP₅
  DP_i
  |
  omuti
  TP₄
    DP_j
      okusinga embwa
    TP₃
      λd
      TP₂
        λx
        TP₁
          Kizito yalaba t_i t_j
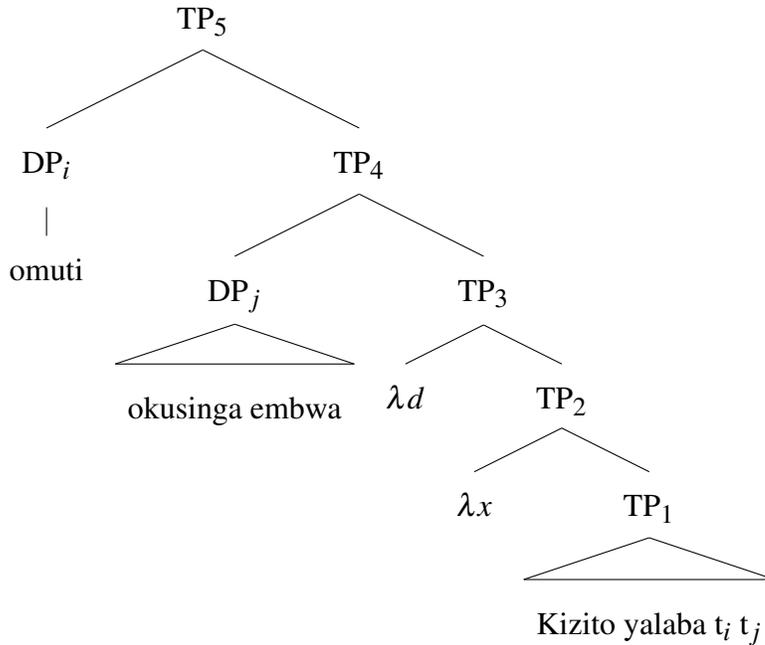
(250) a. ⟦ *okusinga* ⟧ $= \lambda x \lambda G \lambda y.\max(\lambda d.G(y)(d)) \succ \max(\lambda d'.G(x)(d'))$

b. ⟦ DP_j ⟧ $= \lambda G \lambda y.\max(d.G(y)(d)) \succ \max(\lambda d'.G(\text{the.dog})(d'))$

c. ⟦ TP₃ ⟧ $= \lambda d \lambda x.\text{Kizito see } x\, d-\text{much}$

d. ⟦ TP₄ ⟧ $= \lambda y.\max(\lambda d.\text{Kizito see } y\, d-\text{much}) \succ \max(\lambda d'.\text{Kizito see the dog } d'-\text{much})$

e. ⟦ TP₅ ⟧ $= \max(\lambda d.\ \text{Kizito see the tree } d-\text{much}) \succ \max(\lambda d'.\text{Kizito see the dog } d'-\text{much})$

The analysis based on parasitic scope therefore offers a straightforward way of account for the ambiguity of (243). The movement of one or another DP to the highest position determines both the target of comparison and the meaning of the derived gradable predicate.

There are further arguments and language-internal evidence that this analysis is the correct one for Luganda subordinate exceed comparatives. First, QR is independently attested in Luganda. A sentence with two quantificational elements, as in (251), is compatible with two readings: one with surface scope, and one with inverse scope.

(251) *Buli muyezzi akyawa kakensa.*
       buli   mu-yezzi   a-kyawa   ka-kensa
       every NC1-student NC1-hate NC12-professor
       'Every student hates a professor.'

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a. Verifying situation: Alice hates Professor A, Bill hates Professor B, and Charlie hates Professor C. Every student hates a professor. (surface scope: $\forall > \exists$)

b. Verifying situation: Alice, Bill, and Charlie all hate Professor A. Every student hates a (particular) professor. (inverse scope: $\exists > \forall$)

Since the movement operations involved in parasitic scope-taking essentially involve a sort of QR, the fact that covert QR is generally available in this language means that the proposed analysis makes use of an independently attested covert movement strategy.

Second, movement of the target can actually be overt. Luganda makes use of a sentence-initial focus position, where an argument can be scrambled higher to a sentence-initial position.[11] When the intended target of comparison is moved overtly to this position, it necessarily takes the highest scope. In a comparison, this means that the focused element must be interpreted as the target of comparison, since it takes highest scope. A comparison which otherwise would have been ambiguous, then has only one available reading. Such a contrast is shown in (252)-(253), where in (253), the DP *ogubbi* 'the thief' cannot take semantic scope above *omwana* 'the child', which is interpreted as the target of comparison.

(252) *Ogubbi* *gwalabye* *omwana* *okusinga* *Kato.*
   o-gu-bbi   gu-a-labye o-mu-ana o-ku-singa Kato
   AUG-NC20-thief NC20-PST-saw AUG-NC1-child AUG-NC15-exceed Kato

  a. 'The thief saw the child more than he saw Kato.'

  b. 'The thief saw the child more than Kato did.'

(253) *Omwana* *ogubbi* *gwamulabye* *okusinga* *Kato.*
   o-mu-ana o-gu-bbi gu-a-mu-labye o-ku-singa Kato
   AUG-NC1-child AUG-NC20-thief NC20-PST-NC1-saw AUG-NC15-exceed Kato

  a. 'The thief saw the child more than he saw Kato.'

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11. This construction is typically analyzed in terms of movement. The object marking on the verb indicates that the object argument has moved out of the VP, specifically in Luganda, and across Bantu languages more generally (Bresnan & Moshi, 1990; Ssekiryango, 2006).

b. *'The thief saw the child more than Kato did.'

Finally, just as in the previous section, the proposed analysis based on movement makes the prediction that there should be constraints on this movement. This prediction is indeed borne out. When the elements that undergo movement originate within an island, the intended readings are unavailable. This is shown for a relative clause island in (254). While this sentence is grammatical, it is limited in its possible interpretation exactly as expected under the movement-based analysis.

(254)   *Charlotte yasoma*   *ebbaluwa*   [*Lydia gye*   *yawereza*
       Charlotte a-a-soma   e-C-baluwa   Lydia gi-e   a-a-wereza
       Charlotte NC1-PST-read AUG-NC9-letter Lydia NC9-REL NC1-PST-send
       abantu   *bangi*   *okusinga*   *Rita*].
       a-ba-ntu   ba-ngi   o-ku-singa   Rita
       AUG-NC2-person NC2-many AUG-NC15-exceed Rita

    a. * $\max(\lambda d.$Charlotte read a letter that Lydia sent to d-many people$) \succ \max(\lambda d'.$Rita read a letter than Lydia sent to d'-many people$)$

    b. * $\max(\lambda d.$Charlotte read a letter that Lydia sent to d-many people$) \succ \max(\lambda d'.$Charlotte read a letter than Rita sent to d'-many people$)$

    c. OK: Charlotte read a letter such that: $\max(\lambda d.$Lydia sent the letter to d-many people$) \succ \max(\lambda d'.$Rita sent the letter to d'-many people$)$

The intended readings for this sentence that involve movement of the *okusinga* phrase out of the relative clause are unavailable. On the first reading, Charlotte is the target of comparison, and the intended gradable predicate is a relation between individuals and the number of people to whom Lydia sent a letter that those individuals read. In this case, the *okusinga* phrase must move out of the relative clause in order to raise to its scope position. Movement out of the relative clause, however, is blocked. The illicit derivation is shown in (255):

(255)   Reading 1 - (254a):
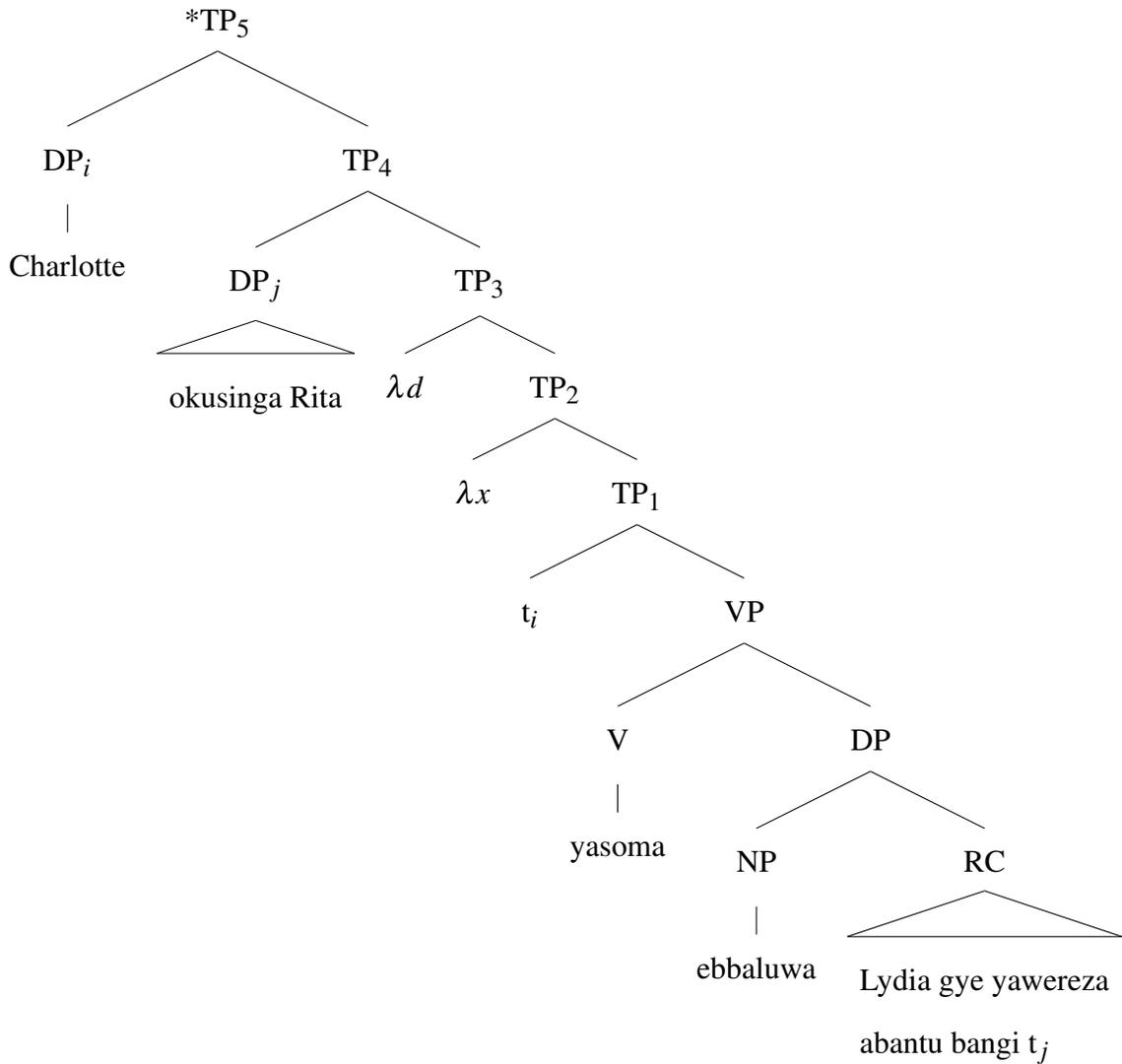
On the intended second reading, Lydia is the target of comparison, and the intended gradable predicate is a relation between individuals and the number of people two whom they sent a letter that Charlotte read. Once again, the *okusinga* phrase would have to move out of the relative clause, but additionally, the target of comparison, *Lydia*, would also have to move out of the relative clause. In this case, both movements are illicit, as shown in (256):

(256)   Reading 2 - (254b):

The tree diagram:

- *TP₅
  - DP_i — Lydia
  - TP₄
    - DP_j — okusinga Rita
    - TP₃
      - λd
      - TP₂
        - λx
        - TP₁
          - DP — Charlotte
          - VP
            - V — yasoma
            - DP
              - NP — ebbaluwa
              - RC — t_i gye yawereza abantu bangi t_j
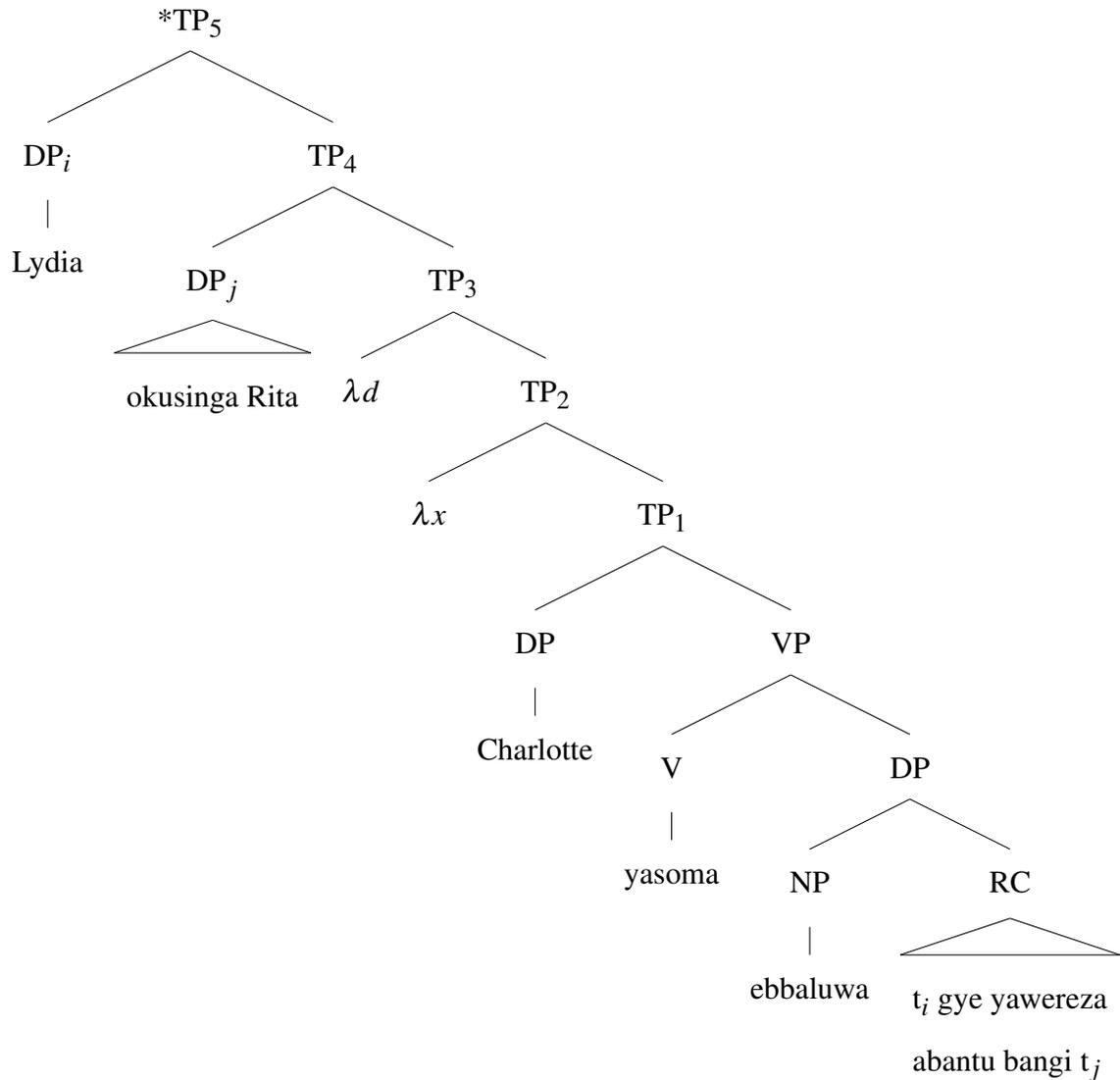
The only reading available for (254) is the one where the comparison is internal to the relative clause. In this case, the target and *okusinga* phrase need only raise within the relative clause, not move out of it. These movements do not constitute island violations, so (254) can receive the interpretation in (254c).

In sum, the interpretation of subordinate exceed constructions requires an abstract movement operation whereby the target of comparison and the *okusinga* phrase raise from their base-generated positions to derive a gradable predicate at LF. This type of movement is a variant of QR, which is attested in Luganda independently. The analysis is able to derive ambiguities for certain sentences, depending on the choice of the target of comparison. Additionally, we are also able to rule out

certain readings of sentences that are unavailable due to constraints on movement.

Both types of exceed constructions, main verb and subordinate exceed, therefore involve covert movement operations that are similar or identical to ones proposed elsewhere for comparative constructions in other languages. I review the cross-linguistic picture in more detail in section 4.6.

4.5   The distribution of measure phrases

In this section, I consider the use of measure phrases in the grammar of gradability and comparison in Luganda. While the analysis in this section remains tentative, I outline the relevant data that a complete analysis should account for, and make suggestions for how such an analysis could be worked out.

Measure phrases do not combine directly with gradable predicates. In (257), the measure phrase appears in a copula construction, while in (258), the measure phrase appears as the object of the verb *alina* 'have'.

(257)   *Omusajja   aliko   mmita   bbiri   (?obuwanvu).*
        o-mu-sajja   a-li=ko   N-mita   C-biri   o-bu-wanvu
        AUG-NC1-man NC1-COP=LOC NC10-meter NC10-two AUG-NC14-tall
        'The man is two meters tall.'

(258)   *Omulenzi   alina   emyaka   kumi (?egy'   obukulu).*
        o-mu-lenzi   a-lina   e-mi-aka   kumi e-gi-a   o-bu-kulu
        AUG-NC1-boy NC1-have AUG-NC4-year ten   AUG-NC4-GEN AUG-NC14-old
        'The boy is ten years.'

Attempting to modify gradable predicates directly results in ungrammaticality, as shown in (259)-(260).

(259)   * *Omusajja   {muwanvu} mmita   bbiri   {muwanvu}.*
        o-mu-sajja   mu-wanvu N-mita   C-biri   mu-wanvu
        AUG-NC1-man NC1-tall   NC10-meter NC10-two NC1-tall
        Intended: 'The man is two meters tall.'

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(260)　* *Omulenzi*　　*{mukulu} emyaka*　　*kumi {mukulu}.*
　　　　o-mu-lenzi　　mu-kulu　e-mi-aka　　kumi mu-kulu
　　　　AUG-NC1-boy　NC1-old　AUG-NC4-year　ten　NC1-old
　　　　Intended: 'The boy is ten years old.'

The nominalized gradable predicates in (257)-(258) are optional, although Kisuule Magala Katende claims their presence is somewhat marked in these examples (hence my use of the stigma ? in these examples). According to the speaker, the reason is that it sounds redundant to overtly name the dimension. However, in a situation where we are comparing two dimensions that use the same measurement system, their use is not redundant, as shown in (261).[12]

(261)　*Emmeeza*　　*eliko*　　*mmita*　　*bbiri*　*ez'*　　　*obuwanvu*
　　　　e-N-meeza　　e-li=ko　　N-mita　　C-biri　e-zi-a　　o-bu-wanvu
　　　　AUG-NC9-table　NC9-be=LOC　NC10-meter　NC10-two　AUG-NC10-GEN　AUG-NC14-long
　　　　ne　mmita　　*ssatu*　　*ez'*　　　*obugazi.*
　　　　ne　N-mita　　C-satu　　e-zi-a　　o-bu-gazi
　　　　and　NC10-meter　NC10-three　AUG-NC10-GEN　AUG-NC14-wide
　　　　'The table is two meters long and three meters wide.'

The notion of redundancy has figured into the recent analysis of measure phrases by Sassoon (2010). While redundancy is not formally implemented in her analysis, Sassoon speculates redundancy does have an effect on whether certain adjective + measure phrase collocations are acceptable cross-linguistically. Specifically, if a measurement uniquely determines a dimension, then mentioning that dimension overtly is redundant and results in reduced unacceptability. While she intends for redundancy to rule out cases like **30 kilos heavy*, the Luganda examples show that redundancy can play a role even in cases where the measurement does not uniquely determine the dimension (compare (257) and (261)).[13]

That measure phrases do not combine directly with gradable predicates is perhaps unsurprising, given Schwarzschild's (2005) analysis of measure phrases. According to this analysis, measure

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12. I do not know why the genitive particle is used in some cases, like in (258) and (261), but not others, as in (257).

13. In fact, it is not clear why redundancy alone should predict outright ungrammaticality of cases like **30 kilos heavy*, as opposed to pragmatic oddity as in (257)-(258).

phrases are predicates of sets of degrees, and are therefore not the right semantic type to combine with gradable predicates in the general case. To account for cases where measure phrases *do* co-occur with gradable predicates in languages like English, Schwarzschild proposes an idiosyncratic type-shifting rule that only applies to certain gradable predicates. This type shift is stated as the Homonym Rule in (262). It states that an adjective that denotes a relation **G** between individuals and degrees can be shifted into a relation between individuals and sets of degrees, or intervals *I*, namely the set of degrees that stand in the **G** relation with an individual *x*. The truth conditions for the sentence *Mary is 5 feet tall* are then modeled as in (263), where $5feet$ is a predicate of intervals; cf. (213), repeated slightly modified below as (264):

(262) Homonym Rule (adapted from Schwarzschild, 2005):

$$\lambda d\lambda x.\mathbf{G}(x,d) \rightsquigarrow \lambda I\lambda x.I = \{d|\mathbf{G}(x,d)\}$$

(263) $[\![\textit{Mary is 5 feet tall}]\!] = \exists I[\mathbf{tall}(m,I) \text{ \& } \mathbf{5feet}(I)]$

(264) $[\![\textit{five feet}]\!] = \lambda I.\mathbf{5feet}(I)$

A drawback of the Homonym Rule is that it must be stipulated which adjectives it applies to. For English, it would apply to *tall*, *wide*, *deep*, *thick*, *old*, *long*, and *high*.[14] However, for a language like Luganda we can simply say that this type shifting mechanism is unavailable in the language, which would explain why measure phrases never modify gradable predicates in this language. This would still leave us with the open question of why this should be so, and I have no satisfactory answer to this question at this time. Given the idiosyncratic distribution of measure phrases cross-linguistically, there is clearly an opportunity for further research in this domain.[15]

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14. The adjectives *early* and *late* also accept measure phrase modification in English, but Schwarzschild argues that these adjectives are inherently comparative and therefore do not require the Homonym Rule to allow them to co-occur with measure phrases (since measure phrases are generally more acceptable with comparatives; more on this observations below).

15. As pointed out by Grano & Kennedy (2012), a drawback of Schwarzschild's analysis is that he must introduce

As Schwarzschild further points out, it is quite common for languages to disallow measure phrases with the positive form of gradable predicates, while allowing them in comparatives. In these cases, however, measure phrases take on a differential interpretation, rather than an absolute one. Both main verb and subordinate exceed constructions allow differential measure phrases, as shown in (265)-(266):

(265) *Ekitabo*   *kino*   *kisinga*   *kili*   *emiko*   *kumi*
     e-ki-tabo   ki-no   ki-singa   ki-li   e-mi-ko   kumi
     AUG-NC7-book NC7-PROX NC7-exceed NC7-DIST AUG-NC4-page ten
     (ʔobuwanvu).
     o-bu-wanvu
     AUG-NC14-long
     'This book is ten pages longer than that one.'   MAIN VERB EXCEED

(266) *Ekitabo*   *kino*   *kiliko*   *emiko*   *kumi okusinga*
     e-ki-tabo   ki-no   ki-li=ko   e-mi-ko   kumi o-ku-singa
     AUG-NC7-book NC7-PROX NC7-COP=LOC AUG-NC4-page ten   AUG-NC15-exceed
     kili   *(ʔobuwanvu).*
     ki-li   o-bu-wanvu
     NC7-DIST AUG-NC14-long
     'This book is ten pages longer than that one.'   SUBORDINATE EXCEED

Comparatives entail a difference in degree between the two individuals being compared. The measure phrase has the function of naming that difference. This is in fact the main motivation behind Schwarzschild's analysis of measure phrases as predicates of sets of degrees. The measure phrase *5 feet* is a predicate of a set of degrees (or 'gap' in Schwarzschild's terms) that is true if and only if the size of the gap is 5 feet.

Under this analysis, the truth conditions of a comparatives like (265)-(266) containing measure phrases can be stated as in (268).

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a new semantic type for intervals. This is necessary because if intervals are instead rendered as sets of degrees (which is the intuitive definition of an interval), the resulting type of a measure phrase would be $\langle\langle d,t\rangle,t\rangle$, a quantifier over degrees. This incorrectly predicts that measure phrases should interact scopally with other quantificational element, which does not seem to be the case. The appeal to a new semantic type for intervals is therefore necessary to avoid this difficulty.

(267) $[\![(265)]\!] = [\![(266)]\!] = \max(\lambda d.\mathbf{long}(this.book) \succeq d) \succ \max(\lambda d'.\mathbf{long}(that.book) \succeq d')$

       & $\mathbf{10pages}(\{d|\mathbf{long}(this.book) \succeq d\} - \{d'|\mathbf{long}(that.book) \succeq d'\})$

Measure phrases can also appear as the standard of comparison in both types of exceed constructions.

(268) *Kizito asinga   *(ku) futi tano.*
      Kizito a-singa   ku   futi tano
      Kizito NC1-exceed LOC foot five

      'Kizito is taller than five feet.'   MAIN VERB EXCEED

(269) *Kizito muwanvu okusinga   *(ku) futi tano.*
      Kizito mu-wanvu o-ku-singa   ku   futi tano
      Kizito NC1-tall   AUG-NC15-exceed LOC foot five

      'Kizito is taller than five feet.'   SUBORDINATE EXCEED

Here we have further evidence for phrasal degree standards for both types of exceed constructions. What is interesting is that the measure phrase cannot appear directly as the object of *-singa*.[16] Rather, the morpheme *ku* must be used to introduce the measure phrase. We can make sense of this by proposing that *ku* is a type-shifter, that takes a measure phrase, which by hypothesis is a predicate of intervals and lowers the type to d, naming the degree of the measure phrase, as in (270). This would then allow the measure phrase to serve as the standard argument of the exceed verb.

(270) $[\![ku]\!]([\![five\,feet]\!]) = \mathbf{5feet}_d$

An alternative view would be to follow Svenonius & Kennedy (2006) and Grano & Kennedy (2012) and claim that measure phrases already denote degrees (type d), but their presence needs to be licensed by a syntactic operator μ. Under this view, the idiosyncrasies associated with measure phrase modification are due to the syntactic selectional restrictions of μ. In a language like English,

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16. Again, as stated above, this fact could be taken as evidence that the *ku*-phrase is not a syntactic argument of *-singa*.

μ can only select for the adjectives *tall*, *wide*, etc., which explains why measure phrases can only occur with these adjectives. We could then say that in Luganda, μ does not select for any gradable adjectives, explaining the data in (259)-(260). However, μ can freely select for comparative-form adjectives in English. It is less clear how this view could be implemented in Luganda, since there is no comparative form of gradable adjectives. A possible strategy would be to tie μ in comparatives somehow to the nominalized forms of gradable predicates which appear in (257)-(258) and (261)-(266). I do not pursue this idea any further here, in large part because this style of analysis views measure phrases as denoting degrees, which I argued against in section 4.3 in order to circumvent Moltmann's arguments on nominalizations.

4.6   Conclusion

In this chapter, I argued for an analysis whereby the exceed verb *-singa* instantiates a semantic comparative morpheme in Luganda, that introduces the comparative relation on par with English *-er*. At least three versions of this morpheme were shown to be necessary. Two were regular 'direct' comparative morphemes that relate two individuals according to a gradable property. Both versions take three arguments: two individuals, and either a gradable predicate meaning of type $\langle d, \langle e,t \rangle \rangle$, or a nominalized gradable predicate meaning of type $\langle e, \langle d,t \rangle \rangle$. A third, and perhaps unexpected, version of *-singa* was a two-place version, that only took two degrees as arguments, and compared them directly. While two-place versus three-place comparative operators are typically taken to track the clausal versus phrasal distinction, we have evidence in Luganda for a two-place phrasal comparative morpheme. What this indicates is that the two-place/three-place distinction cuts across the clausal/phrasal distinction. Thus, the variation observed between Luganda and English is this respect lies at the syntax-semantics interface. Whereas there is evidence that comparative morphemes in both languages have the same core lexical semantics (i.e., introduce an asymmetric ordering between degrees), the ways these morphemes interact in their syntactic environments is quite different. This conclusion is perhaps not surprising, given that the comparative

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morphemes in English and Luganda belong to completely different syntactic categories.

To be sure, we also found a certain amount of lexical variation as well. Most notably, in chapter 3 we observed variation within the class of gradable adjectives with respect to the lexicalization of measure functions. Whereas I argued that many gradable predicates in Luganda lexicalize measure functions just like their English counterparts, certain properties are lexicalized instead as predicates of degrees that must combine with possessive morphology to turn them into gradable predicates. Of course, this distinction is borne out in the syntactic categories of the relevant properties. Whereas adjectives and verbs can lexicalize measure functions directly, those more 'impoverished' properties are instantiated as nouns. Thus, this aspect of lexical variation corresponds with parallel variation in the syntax of these predicates. This conclusion lends support to recent work by Francez & Koontz-Garboden (2012) on the relation between lexicalization patterns in gradable predicates and their syntactic category.

Chapter 5

CONJOINED AND LOCATIVE COMPARISONS IN WASHO

5.1 Introduction

In this chapter I outline the properties of two means of expressing comparison in Washo. This language makes use of two strategies for expressing comparison: conjoined comparison, and locative comparison. Examples of these two constructions are given in (271) and (272), respectively. The conjoined comparison in (271) consists of two independent clauses containing antonymous predicates, the subjects of which are the target and standard of comparison. The locative comparison in (272), meanwhile, consists of a single clause, where the standard of comparison is marked by a locative postposition.

(271) *t'éːliwhu delkáykayiʔ*   *k'éʔi*   *šáwlamhu delkáyayiʔéːs*
       t'eːliwhu de-ʔil-kaykay-iʔ   k'-eʔ-i   šawlamhu de-ʔil-kaykay-iʔ-eːs
       man   NMLZ-ATTR-tall-ATTR 3-COP-IPFV girl   NMLZ-ATTR-tall-ATTR-NEG
       k'áʔaš
       k'-eʔ-aʔ-š
       3-COP-AOR-SR
       'The man is taller than the girl.'

       literally: 'The man is tall, the girl is not tall.'

(272) *t'éːliwhu ʔilkáykayiʔi*   *šáwlamhu lélew*
       t'eːliwhu ʔil-kaykay-iʔ-i   šawlamhu lelew
       man   ATTR-tall-ATTR-IPFV girl   beside
       'The man is taller than the girl.'

       'The man is tall, beside the girl.'

The chapter is organized as follows. Section 5.2 introduces some background on Washo morphosyntax, including strategies for scalar predication. In section 5.3 I describe the conjoined comparison and locative comparison constructions in more detail. Section 5.4 presents an analysis of the semantics of conjoined comparisons. Specifically, I show that they pattern like implicit

comparisons based on Kennedy's (2007a) tests, and I argue there is no comparative morpheme implicated in this construction that provides a comparative semantics. In section 5.5 I argue that locative comparison in Washo is also implicit comparison, despite some variability in the results of Kennedy's tests. I provide an analysis of this construction whereby the comparison interpretation arises as a conversational implicature, together with a coerced type-shift of the scalar predicate to allow composition with the locative phrase. We are thus left with the conclusion that Washo has no comparative morpheme, and in section 5.6 I suggest that this is due to variation in the lexical semantics of the gradable predicates themselves, and set the stage for testing this hypothesis in the following chapter.

5.2 Background on Washo morphosyntax

In this section, I discuss certain features of Washo morphosyntax that will be relevant for understanding the data to be presented in this chapter and chapter 6. Specifically, I describe features of verbal and nominal morphosyntax, including the ways in which complex verb stems are built, and the morphosyntax of scalar predication in the language.

5.2.1 Verbal morphosyntax

Washo is spoken around the Lake Tahoe area of California and Nevada. The main reference grammar is Jacobsen (1964). It is thought to be a language isolate, though has controversially been linked to the proposed Hokan group/family by Sapir (1917) (see Campbell, 1997; Mithun, 1999, for discussion). Neutral word order is SOV, though occasionally arguments and adjuncts can appear after the verb, giving rise to information structural effects (Jacobsen, 1964). An example of a transitive clause is given in (273):

(273)   *t'é:liwhu zí:gɨn*   *ʔádaš ʔíʔwi*
       t'e:liwhu zi:gɨn   ʔadaš ʔ-iʔiw-i
       man   chicken meat   3-eat-IPFV

'The man ate the chicken.'

Subject and object agreement is marked on the verb. In the case of (273) above, the ʔ- prefix on a vowel-initial verb marks a third person subject acting on a third person object; this marking is null on consonant-initial stems. When a third person object is suppressed or left implicit, the prefix *k'-* is used on vowel-initial stems, as shown in (274), while *ge-* is used on consonant-initial stems:

(274)   *t'éːliwhu k'íʔwi*
        t'eːliwhu k'-iʔiw-i
        man   3.UNEXP.OBJ-eat-IPFV
        'The man is eating it.'

Jacobsen (1964) refers to this prefix as "third person unexpressed object"; going forward I will simply gloss the *k'-* prefix as third person, so as not to overcomplicate the glossing. A second person subject is marked with the prefix *ʔum-* on consonant-initial stems, and *m-* or *mi-* on vowel-initial stems. A first person subject is marked with the prefix *di-* on consonant-initial stems, and *le-* on vowel-initial stems. Examples with these prefixes on the verb stem *-iʔiw* 'eat' are shown in (275)-(276). Only person is marked on these prefixes; number and gender are unmarked.

(275)   *hút'aŋa   héːš míʔwi*
        hut'aŋa   heːš m-iʔiw-i
        something Q   2-eat-IPFV
        'Did you eat something?'

(276)   *hút'aŋa   leʔwéːsi*
        hut'aŋa   le-iʔiw-eːs-i
        something 1-eat-NEG-IPFV
        'I didn't eat anything.'

While person agreement is marked by prefixes, all other verbal morphology is suffixed. A finite verb form at the very least is marked with a person prefix, as well as an aspectual suffix. All the examples so far have verb stems marked with the imperfective *-i* suffix. According to Jacobsen

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(1964), this suffix is the most common, and often "seems to be present just for formal reasons, and not to add anything to the meaning of the [verb] form" (p. 663). Other suffixes that make up the paradigm of aspectual suffixes are the -*aʔ* aorist, -*hi* optative, and -*le* redundant, the last two being rather infrequent. Other suffixes that appear on verbs appear almost exclusively between the stem and aspectual morphology. A non-exhaustive list includes -*eːs* negation, shown in (276), -*ha* causative, -*etiʔ* inchoative, and tense morphemes.

Other types of morphology can appear after the aspectual suffix. The first is the switch-reference marker -*š*, which is used to indicate non-identity of subject referents in two consecutive clauses (Jacobsen, 1964, 1981).[1] In (277) below, both clauses have the same third person subject, and there is no switch reference marking. Meanwhile in (278), the third person subject in the first clause is distinct from the third person subject in the second clause, and switch reference is marked on the second clause.

(277)   *Beverly t'éːk'eʔ t'áːgɨm   ʔíʔwi   demuc'úc'uŋa   t'éːk'eŋa   ʔiʔwéːsaʔ*
        Beverly t'eːk'eʔ t'aːgɨm   ʔ-iʔiw-i   de-muc'uc'u-ŋa   t'eːk'eʔ-ŋa ʔ-iʔiw-eːs-aʔ
        Beverly many   pine.nuts 3-eat-IPFV NMLZ-sweet-NC many-NC   3-eat-NEG-AOR
        'Beverly ate many pine nuts. She didn't eat many berries.'

        'Beverly ate more pine nuts than berries.'

(278)   *Beverly t'éːk'eʔ t'áːgɨm   ʔíʔwa**š**   Steven demuc'úc'u   hénuŋ ʔíʔwaʔ*
        Beverly t'eːk'eʔ t'aːgɨm   ʔ-iʔiw-aʔ-**š**   Steven de-muc'uc'u henuŋ ʔ-iʔiw-aʔ
        Beverly many   pine.nuts 3-eat-AOR-SR Steven NMLZ-sweet little   3-eat-AOR
        'Beverly ate many pine nuts. Steven ate a few berries.'

        'Beverly ate more pine nuts than Steven ate berries.'

Other suffixes that may appear after aspectual morphology and switch reference marking are -*da* 'and' and -*ŋa* 'but', as well as relative clause marking. Relative clauses in Washo are internally-headed, and are marked with a suffix that tracks whether the subject of the relative clause corresponds with the subject or non-subject argument of the matrix clause (Jacobsen, 1981). Subject

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1. By 'consecutive' I mean with respect to surface word order. The two clauses can be in either a coordination or subordination relationship to each other.

relatives are marked with the suffix *-gi*, while non-subject relatives, shown in (279), are marked with *-ge*. In this example, the heron is the subject of the internally-headed relative clause, and is understood as the non-subject argument of the matrix verb *ya:maʔ* 'she spoke'.

(279)   *k'ák'aʔ dá: gé:geliš**ge**   yá:maʔ*
           k'ak'aʔ da: ge:gel-i-š-**ge**   ya:m-aʔ
           heron   there sit-IPFV-SR-OBJ.REL speak-AOR
           'She spoke to a heron who was sitting there.'   (Jacobsen, 1981, p. 111)

5.2.2   *Complex verb stems*

A striking feature of Washo verbal morphology is that many verb stems are polymorphemic, the result of combining elements that typically cannot stand on their own as verb stems. This pattern of compound stem formation was described in detail by Jacobsen (1980), and given a more recent treatment by Bochnak & Rhomieux (2013). An 'initial' element is combined with a 'final' element to form a complex verb stem, which can then be used as the base for the regular derivation and inflection processes for verbs as described above.

(280)   *t'ánu   pélew ʔugát'ɨgi*
           t'anu   pelew ʔ-ug-at'g-i
           person rabbit 3-with.club-kill-IPFV
           'Someone killed a rabbit (with a club-like object).' (Bochnak & Rhomieux, 2013, p. 225)

(281)   *dipá:ši*
           di-p-a:š-i
           1-fall-in-IPFV
           'I fell in.'   (Bochnak & Rhomieux, 2013, p. 257)

Although the final *-at'g* 'kill' in (280) and the initial *p-* 'fall' in (281) are glossed as verbs in English, neither of these elements can stand alone as verbs, as is the case for all of the initials and most of the finals that enter into this construction. As we will see in section 5.2.4, a subset of scalar predicates are formed using a special instance of this complex verb stem formation process.

5.2.3 *Nominal morphosyntax*

Many noun stems in Washo can stand as independent words.[2] Nominal predication is mediated by the copula verb *-eʔ*, which bears agreement and aspectual inflection as shown in (282).[3,4]

(282) *Mary šáwlamhu k'éʔi*
       Mary šawlamhu k'-eʔ-i
       Mary girl   3-COP-IPFV
       'Mary is a girl.'

Nouns can be derived from verb stems via a nominalization prefix that takes the form *t'-* before vowel-initial stems, and *de-* before consonant-initial stems. While the prefix always appears on the verb, Bochnak et al. (2011) argue that the morpheme takes semantic scope at (at least) the VP level. As shown in (283), certain other verbal morphology can also appear on the nominalized verb stem, such as negation. However, agreement and aspectual morphology are never present in such nominalizations.

(283) *géwe   t'ánuŋa   **t'iʔwéːs**   k'éʔi*
       gewe   t'anu-ŋa   **t'-iʔiw-eːs** k'-eʔ-i
       coyote person-NC NMLZ-eat-NEG   3-COP-IPFV

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2. Some nouns are inalienably possessed and require a possessive prefix. An example is given in (1):

(1) *láːdu*
     le-adu
     1.POSS-hand
     'my hand'

3. The third person agreement on the copula verb in (282) is obligatorily *k'-*. See arguments in Bochnak et al. (2011) that the *k'-* prefix in this case is not related to the "unexpressed object" form of the agreement on transitive verbs, but rather derived from an underlying *k-ʔ-* sequence, where *ʔ-* is the regular third person agreement on vowel-initial stems, and the presence vs. absence of *k-* tracks the individual vs. stage-level distinction.

4. The copula can in certain cases be optionally dropped when appearing with nominal predicates. The exact conditions under which the copula can be dropped are not fully known. Going forward, I avoid providing examples where the copula is omitted by speakers.

'Coyotes don't eat people.' / 'Coyotes are not people-eaters.'   (Bochnak et al., 2011, p. 3)

With these facts in mind, we can now turn to the morphosyntax of scalar predication in Washo.

5.2.4   Scalar predicates in Washo

Washo lacks a distinct morphosyntactic category of adjectives; scalar concepts are typically lexicalized as verbs, as in (284):

(284)   scalar predication as a verb:

    a. *ʔitdíʔyu*   *yásaŋi*   *gawguwɨléːs*
          ʔit-diʔyu   yasaŋ-i   ge-wguwɨl-eːs
          INS.NMLZ-fire hot-IPFV IMP-touch-NEG
          'The stove is hot, do not touch it!'

    b. *méːhu* *ʔilkáykayiʔi*
          meːhu ʔil-kaykay-iʔ-i
          boy   ATTR-tall-ATTR-IPFV
          'The boy is tall.'

In (284a), *yasaŋ* 'hot' is a monomorphemic verb stem that is inflected directly for aspect. In (284b), the stem *-kaykay-* 'tall' is flanked by the morphemes *ʔil-...-iʔ*, both glossed as 'attributive', following Jacobsen (1964, 1980). I do not describe this morphology as a circumfix, since for some predicates only the suffix *-iʔ* appears. Jacobsen (1980) considers verb stems formed with the attributive morphology a special case of the bipartite verb stem formation pattern. Many of the scalar roots are found independently as finals in more prototypical bipartite stems, as shown in (285), where the final *-ilp'il* 'blue' appears with the initial *tug-* 'eye'. Meanwhile, in its use as a scalar predicate, the stem appears in a partially reduplicated form, along with the attributive morphology, as in (286), where Jacobsen considers *ʔil-* an initial element of a bipartite stem.

(285)   *tugílp'ili*
       tug-ilp'il-i
       eye-blue-IPFV
       'He has blue eyes.'   (Jacobsen, 1964, p. 109)

(286) *ʔilpʼílpʼiliʔi*
ʔil-pʼilpʼil-iʔ-i
ATTR-blue-ATTR-IPFV
'It is blue.'

Going forward, when I refer to scalar predicates in Washo, I am referring to the form including the root together with the attributive morphology, if it occurs with that root. I discuss hypotheses about the semantic interpretation of this morphology later on in chapter 6, but ultimately conclude that it is semantically vacuous.

In many contexts, we also find a verb stem naming a scalar predicate in a nominalized form, by means of the nominalizing prefix *de-* (or *tʼ-*) as described in section 5.2.3. This prefix attaches outside the attributive morphology, if it is present in the non-nominalized form. The nominalized predicate is accompanied by the copula verb *-eʔ*, which is where verbal agreement and aspectual morphology appear. In (287a), the monomorphemic verb stem *yakáš* is nominalized, while in (287b), a stem with attributive morphology is nominalized.

(287)   nominalization + copula:

    a. *díːbe dayákʼaš   kʼéʔi*
       diːbe de-yakʼaš   kʼ-eʔ-i
       sun   NMLZ-warm 3-COP-IPFV
       'The sun is warm.'

    b. *méːhu delkáykayiʔ   kʼéʔi*
       meːhu de-ʔil-kaykay-iʔ   kʼ-eʔ-i
       boy   NMLZ-ATTR-tall-ATTR 3-COP-IPFV
       'The boy is tall.'

As far as I can tell, there is no semantic difference between scalar predicates when they appear as verbs or in a nominalized form, at least for the constructions to be discussed here.[5] Going forward, these two forms of scalar predicates will be taken to have equivalent semantic interpretations.

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5. For non-stative verb stems, there is a tendency for the verbal constructions to receive an episodic interpretation, while nominalized forms receive a generic interpretation (Bochnak et al., 2011).

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5.3 Conjoined and locative comparisons in Washo

In this section I present more detailed descriptions of the two strategies for making comparisons in Washo: conjoined comparisons; and locative comparisons.

5.3.1 Conjoined comparisons

The primary comparison strategy in Washo is conjoined comparison, whereby two independent clauses containing antonymous predicates are juxtaposed, as in (288). This strategy is widely attested in the world's languages. In Stassen's (1985) typology of comparison constructions in 110 languages, 26 (23.6%) use conjoined comparison as a primary or secondary means of expressing comparison.[6]

(288)   *t'éːliwhu delkáykayiʔ*   *k'éʔi*   *šáwlamhu delkáyayiʔéːs*
     t'eːliwhu de-ʔil-kaykay-iʔ   k'-eʔ-i   šawlamhu de-ʔil-kaykay-iʔ-eːs
     man   NMLZ-ATTR-tall-ATTR 3-COP-IPFV girl   NMLZ-ATTR-tall-ATTR-NEG
     k'áʔaš
     k'-eʔ-aʔ-š
     3-COP-AOR-SR
     'The man is taller than the girl.'

     'The man is tall, the girl is not tall.'

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6. The conjunction strategy used in Washo is unmarked morphologically for any temporal relation between the two clauses, and therefore the situations described in the two clauses are typically interpreted as occurring simultaneously. When a clause is marked with the 'sequential' suffix *-ud*, the event described in that clause is interpreted as occurring before another event described in another clause, as shown in (1):

(1)   *didóːdamamaʔ**ud**i*   *digéːgelaʔ*   *TV disúːdumaʔ*
     di-doːdaʔ-mamaʔ-**ud**-i di-geːgel-aʔ TV di-suːdum-aʔ
     1-do-finish-SEQ-IPFV 1-sit-AOR   TV 1-watch-AOR
     'I finished it all and then sat down and watched TV.'

A more detailed study of the temporal interpretation of clausal chains is left to future research.

The scalar predicates are not marked with any overt comparative morphology in either clause. In (288), we simply find the positive (unmarked) form in a regular predication structure, in this case using nominalized predicates with the copula (cf. (287)). While speakers typically offer sentences of this form as translations of English comparative constructions, a more literal translation of (288) would be something like "The man is tall, the girl is not tall."

In the comparison in (288), the predicate in the second clause is the negation of the predicate in the first (i.e., derived via the negation morpheme *-eːs*). However, as shown in (289), a lexicalized antonym pair can also appear in this construction.

(289) *méːhu delkáykayiʔ*   *k'éʔi* *šáwlamhu ʔilkúškušiʔaš*
   meːhu de-ʔil-kaykay-iʔ k'-eʔ-i šawlamhu ʔil-kuškuš-iʔ-aʔ-š
   boy NMLZ-ATTR-tall-ATTR 3-COP-IPFV girl ATTR-short-ATTR-AOR-SR
   'The boy is taller than the girl.'

   'The boy is tall, the girl is short.'

The comparisons in (288) and (289) contain dimensional predicates, using the terminology of Bierwisch (1989), i.e., those typically associated with a measurement system. However, conjoined comparisons can also be formed with non-dimensional, or evaluative, predicates as well, as shown in (290).

(290) *dawp'áp'ɨl delélegiʔ*   *Míːgiʔáŋawiʔi* *delc'ác'imiʔ*
   dawp'ap'ɨl de-ʔil-leleg-iʔ Miːgi-ʔaŋaw-iʔ-i de-ʔil-c'ac'im-iʔ
   flower NMLZ-ATTR-red-ATTR look-good-ATTR-IPFV NMLZ-ATTR-yellow-ATTR
   Míːgiʔáŋawiʔéːsaš
   Miːgi-ʔaŋaw-iʔ-eːs-aʔ-š
   look-good-ATTR-NEG-AOR-SR
   'The red flower is prettier than the yellow one.'

   'The red flower is pretty, the yellow one isn't pretty.'

Furthermore, amount comparison can also be expressed using this construction, as shown in (291).

(291) *Beverly t'éːk'eʔ t'áːgɨm* *ʔíʔwi* *demuc'úc'uŋa* *t'éːk'eŋa* *ʔiʔwéːsaʔ*
   Beverly t'eːk'eʔ t'aːgɨm ʔ-iʔiw-i de-muc'uc'u-ŋa t'eːk'eʔ-ŋa ʔ-iʔiw-eːs-aʔ
   Beverly many pine.nuts 3-eat-IPFV NMLZ-sweet-NC many-NC 3-eat-NEG-AOR

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'Beverly ate many pine nuts. She didn't eat many berries.'

'Beverly ate more pine nuts than berries.'

5.3.2 *Locative comparisons*

In addition to the conjoined comparisons described above, there is a secondary means of expressing comparison sometimes offered by speakers. I refer to this construction as locative comparison. My use of the term *locative comparison* here differs somewhat from that found in Stassen (1985). My use of the term collapses Stassen's separative, allative, and locative comparisons. I classify locative comparison as a secondary option for expressing comparison in Washo, whereas I consider conjoined comparison as the primary strategy. In nearly all elicitation tasks where speakers are asked to give a comparison in Washo, a conjoined comparison is typically given first, and seems to be preferred. It is of course not possible to perform a quantitative corpus study on the frequency of use of conjoined and locative comparisons, so this judgment about primary versus secondary comparison strategies should only be taken as an impressionistic observation.

In contrast with bi-clausal conjoined comparisons, locative comparatives are mono-clausal constructions that make use of a locative postposition or affix to mark the standard of comparison. There are at least three locative postpositions that can be used in comparison contexts: *lelew* 'beside', as shown in (292); *ʔiwiʔ* 'over', as in (293); *dulel* 'beyond', as in (294); and one general locative suffix -*a*, shown in (295).[7]

(292)   *t'éːliwhu ʔilkáykayiʔi*   *šáwlamhu* **lélew**
       t'eːliwhu ʔil-kaykay-iʔ-i   šawlamhu lelew
       man   ATTR-tall-ATTR-IPFV girl   beside
       'The man is taller than the girl.'

       'The man is tall, beside the girl.'

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7. For reasons that are unclear, speakers tend to prefer adding the extra word *hešiʔ*, glossed here as 'amount', with *dulel* 'beyond' in comparison contexts, but not with other locative expressions, and not when *dulel* is used with a purely locative interpretation.

(293) *t'éːliwhu t'éːk'eʔ ʔugálisiʔ   šáwlamhu **ʔíwiʔ**
t'eːliwhu t'eːk'eʔ w-galis-iʔ   šawlamhu ʔiwiʔ
man   many   STATIC-winter-ATTR girl   over

'The man is older than the girl.'

'The man is many years, over the girl.'

(294) *demuc'úc'u muc'úc'u šémuyi   t'áːgɨm **dúlel** hešiʔ*
de-muc'uc'u muc'uc'u šemu-i   t'aːgɨm dulel   hešiʔ
NMLZ-sweet sweet   really-IPFV pinenuts beyond amount

'The berries are sweeter than the pine nuts.'

'The berries are sweet, beyond the pine nuts.'

(295) *demuc'úc'u muʔáŋaw šémuyi   t'áːgɨm**a***
de-muc'uc'u mu-ʔaŋaw šemu-i   t'aːgɨm-a
NMLZ-sweet taste-good really-IPFV pinenuts-LOC

'The berries are tastier than the pine nuts.'

'The berries are tasty, by the pine nuts.'

As can be gleaned from these examples, this construction can be used to express comparison with both dimensional predicates, as in (292) and (293), and non-dimensional predicates alike, as in (294) and (295). Amount comparison can also be expressed using this construction, as shown in (296).

(296) *Beverly t'éːk'eʔ t'áːgɨm   ʔíʔwi   Steven lélew*
Beverly t'eːk'eʔ t'aːgɨm   ʔ-iʔiw-i   Steven lelew
Beverly many   pine.nuts 3-eat-IPFV Steven beside

'Beverly ate more pine nuts than Steven.'

'Beverly ate many pine nuts beside Steven.'

Outside of comparison contexts, these postpositions have locative interpretations, as in (297)-(300):

(297) *Danny **lélew** t'ánu   géːgeli*
Danny lelew t'anu   geːgel-i
D   beside person sit-IPFV

'Someone is sitting next to Danny.'

(298) *t'é:liwhu dípiʔ   šáwlamhu **ʔíwiʔ** máŋaʔi*
t'e:liwhu dipiʔ   šawlamhu ʔiwiʔ maŋaʔ-i
man   blanket girl   over throw-IPFV
'The man threw a blanket over the girl.'

(299) *šaklaméntu daláʔak **dúlel** k'éʔi*
šaklamentu dalaʔak dulel k'-eʔ-i
Sacramento mountain beyond 3-COP-IPFV
'Sacramento is beyond the mountains.'

(300) *t'áŋal**a**   lép'amšegi*
t'-aŋal-a   le-ip'am-šeg-i
3.POSS-house-LOC 1.SBJ-arrive-almost-IPFV
'I almost went to his house.'

I have not found any systematic pattern with respect to what combinations of scalar predicates and locative markers are allowed or excluded. In most cases, speakers produced or accepted comparisons using all combinations of locative markers . This tendency, however, is not absolute. For instance, there is some variability in crisp judgment contexts. I save these examples for the discussion of explicit versus implicit comparison the next section. For now though, I would like to point out that in certain contexts, there are certain combinations that speakers find unacceptable. However, such restrictions appear to be due to the lexical contribution of the locative marker itself. That is, the standard-marking elements appear to retain their locative semantics even when the meaning of comparison is at issue. For instance, a speaker finds the comparison in (301) unacceptable in the given conversational context, and the speaker's volunteered comments indicate that the locative relation between the objects is the source of the unacceptability.

(301)   a. Context: comparing two ladders standing next to each other

      b. # *wí:diʔ t'éweʔ dewgúliweʔ k'éʔi   wí:diʔ ʔíwiʔ*
          wi:diʔ t'eweʔ dewguliweʔ k'-eʔ-i   wi:diʔ ʔiwiʔ
          this   much   height   3-COP-IPFV this   over
          Intended: 'This one is taller than that one.'

          Speaker's comment: "You would only say that... if this tall ladder was maybe laying on top of this little short one."

An interesting set of minimal pairs also illustrate this point. Both versions of (302) and (303) are grammatical as comparisons with both *lelew* 'beside' and *ʔiwiʔ* 'over'. However, their uses are restricted to contexts where the locative relation between the two objects also holds.

(302)   a. Context: comparing the lengths of a rope and a table, where the rope is lying beside the table

       b. *bec'ílšiʔ t'éːweʔ dewgíʔiš téːbɨl lélew / #ʔíwiʔ*
          bec'ilšiʔ t'eːweʔ dewgiʔiš teːbɨl lelew / ʔiwiʔ
          rope   much length   table beside / over
          'The rope is longer than the table.'

          Speaker's comment: "Maybe you put the rope across here . . . so it would be *by* the table . . . on the side."

(303)   a. Context: comparing the lengths of a rope and a table, where the rope is lying on top of the table

       b. *bec'ílšiʔ t'éːweʔ dewgíʔiš téːbɨl ʔíwiʔ / #lélew*
          bec'ilšiʔ t'eːweʔ dewgiʔiš teːbɨl ʔiwiʔ / lelew
          rope   much length   table over / beside
          'The rope is longer than the table.'

          Speaker's comment: "That means up on top of here." (points to the top of the table)

In section 5.5, I use these facts as evidence to argue that the locative markers do not encode a comparative semantics.

In the following sections, I apply Kennedy's (2007a) tests for explicit versus implicit comparison to both types of comparisons in Washo. We will observe certain differences between conjoined and locative comparisons by way of these tests, though I ultimately argue that both types are in fact implicit comparison.

5.4 The analysis of conjoined comparisons

In this section I focus on the analysis of conjoined comparisons in Washo. I apply the tests for explicit vs. implicit comparison and show that conjoined comparisons behave like implicit comparisons, indicating that the comparison interpretation is not derived from a dedicated comparative morpheme. I furthermore argue that conjoined comparisons always receive a norm-related interpretation, and that the comparison interpretation is an inference derived from general properties of the use of the positive form.

5.4.1 Tests for explicit vs. implicit comparison

Recall once again the distinction between explicit and implicit comparison, whose definitions are repeated below:

(304)   a. *Explicit comparison*: establishes an ordering relation between objects *x* and *y* with respect to a gradable property *g* using a morphosyntactic form whose conventional meaning has the consequence that the degree to which *x* is *g* exceeds the degree to which *y* is *g*.

   b. *Implicit comparison*: establishes an ordering between objects *x* and *y* with respect to a gradable property *g* using the positive form by manipulating the context in such a way that the positive form is true of *x* and false of *y*.

Recall as well the following tests used by Kennedy (2007a) to distinguish explicit and implicit comparison: (i) felicity in crisp judgment contexts; (ii) felicity with absolute standard predicates; and (iii) acceptability with differential measure phrases. As I will show in the next chapter, Washo lacks measure phrase modifiers of gradable predicates, so once again I only focus on the first two tests in this section. The results of applying the tests will show that conjoined comparisons behave like implicit comparisons. As for locative comparisons, the test results are less conclusive. However, I argue that these constructions also do not contain a morpheme that contributes the

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comparative semantics, and thus also count as implicit comparison.

Given that there is no special morphosyntactic form involved in conjoined comparisons, these constructions appear on the surface to be instances of implicit comparison. However, we should control for the possibility that there is a covert comparative morpheme present that contributes the semantics of (or at least similar to) English *-er/more*. For instance, Beck et al. (2004) and Kennedy (2007a) suggest that there is a covert morpheme in Japanese comparatives that contributes the comparative semantics. To take an example from another semantic domain, Matthewson (2006b) analyzes superficially tenseless clauses in St'át'imcets as actually containing a covert tense morpheme that introduces a non-future reference time. Thus, we cannot immediately conclude that conjoined comparisons are implicit comparisons solely on the basis of surface appearances, and must at least consider the possibility of the existence of covert morphology that contributes the comparison semantics. After performing the relevant tests, however, we will see that conjoined comparisons are in fact implicit comparisons.

5.4.1.1   Crisp judgment contexts

Recall that the positive form of predicates like *tall* are subject to the Similarity Constraint in chapter 2, and require an individual to 'stand out' relative to others to be used felicitously. This means that it is difficult to make distinctions between two individuals that occupy very close positions on a scale. Implicit comparisons are therefore predicted to be infelicitous in such crisp judgment contexts, since they make use of the positive form of gradable predicates and should be subject to the same constraints on their use.

With respect to this test, Washo conjoined comparisons pattern like implicit comparisons, as shown in (305). It is unacceptable to claim that one ladder counts as tall and the other not, when there is only a slight difference in height between them.

(305)   a. Context: comparing two ladders, where one is only slightly taller than the other.

b. # *wíːdiʔ ʔitmáŋa delkáykayiʔ*   *k'éʔi* *wíːdiʔ*
 wiːdiʔ ʔitmaŋa de-ʔil-kaykay-iʔ k'-eʔ-i wiːdiʔ
 this ladder NMLZ-ATTR-tall-ATTR 3-COP-IPFV this
 delkáykayiʔéːs   *k'éʔaš*
 de-ʔil-kaykay-iʔ-eːs   k'-eʔ-aʔ-š
 NMLZ-ATTR-tall-ATTR-NEG 3-COP-AOR-SR

 Intended: 'This ladder is taller than that one.'

 (lit.: 'This ladder is tall, that one is not tall.')

Interestingly, the failure of attempting to use a conjoined comparison in this context derives not from manipulating the context to place one object in the positive extension and one object in the negative extension of the predicate (cf. the definition of implicit comparison in (304b)). Rather, this condition is overtly expressed in the comparison in (305): the first clause asserts that one ladder counts as tall, while the second clause asserts that the other ladder does not count as tall. That is, by using this construction, speakers are required to assert that a property holds of one object, and that its antonym holds of another object. The fact that the predicates involved are vague, and thus subject to the Similarity Constraint, speakers are unwilling to accept the truth of both clauses together in cases like (305).

Note that conjoined comparisons in crisp judgment contexts improve with the addition of modifiers that allow speakers to hedge on their commitment to the truth of a proposition containing a vague predicate. In (306), the speaker circumvents the constraint against using implicit comparison in a crisp judgment context by modifying the scalar predicate *t'íːyeliʔ* 'big' with the modifier *wéwši*, which is typically translated as 'almost' or 'slightly'.[8]

(306) a. Context: comparing two pinecones that differ minimally in size.

  b. *wíːdiʔ behéziŋaš* *lák'aʔ wíːdiʔ t'íːyeliʔ wéwši*
   wiːdiʔ beheziŋ-aʔ-š lak'aʔ wiːdiʔ t'iːyeliʔ wewš-i
   this small-AOR-SR one this big almost-IPFV

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 8. Note that implicit comparisons in English can also be 'repaired' in this way in crisp judgment contexts; cf. *Compared to Bill, Joe is sort of tall*, and the English translation of (306).

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'This one is bigger than that one.'

'This one is small, that one is almost big.'

Thus the addition of modifiers has the effect of enabling speakers to make finer distinctions in such contexts than the unmodified positive form allows.

5.4.1.2 Absolute standard predicates

Recall that implicit comparison is expected to be infelicitous with absolute-standard predicates since their standards are not context-dependent. Meanwhile, explicit comparison is predicted to be felicitous because the comparative operator simply requires two distinct degrees of bend or moisture. As shown in (307), conjoined comparisons in Washo pattern like implicit comparisons.

(307)   a. Context: comparing two bent rods, one more bent than the other (though not a crisp judgment context)

      b. # *wíːdiʔ ʔilkʼúnkʼuniʔaš*   *wíːdiʔ ʔilšíːšibiʔi*
          wiːdiʔ ʔil-kʼunkʼun-iʔ-aʔ-š   wiːdiʔ ʔil-šiːšib-iʔ-i
          this   ATTR-bent-ATTR-AOR-SR this   ATTR-straight-ATTR-IPFV
          Intended: 'This one is more bent than that one.'

          (lit: 'This one is bent, that one is straight.')

Washo conjoined comparison behaves like the English *compared to* construction with respect to this test, though the reason for their failure is slightly different. According to Kennedy (2007a), the infelicity of the *compared to* construction derives from the fact that narrowing the context has no semantic effect on the interpretation of minimum-standard predicates in contrast with context-dependent ones. By contrast, the form of conjoined comparisons requires the speaker to assert that a property holds of one object, and that an antonymous property holds of the other object. In the case of (307), it is simply false to assert that one rod is straight, since the context provides that both rods have some degree of bend.

As with the crisp judgment contexts, conjoined comparisons with minimum standard predicates become acceptable with the addition of modifiers. In (308), the speaker hedges by claiming that one rod is bent while the other is 'almost straight'. In (309), the speaker asserts that one rod is bent, while the other is 'not very bent'.

(308) a. Context: same as (307)

b. *wíːdiʔ ʔilkʼúnkʼuniʔaš*   *wíːdiʔ ʔilšíːšibiʔ*   *wéwši*
    wiːdiʔ ʔil-kʼunkʼun-iʔ-aʔ-š wiːdiʔ ʔil-šiːšib-iʔ   wewš-i
    this   ATTR-bent-ATTR-AOR-SR this   ATTR-straight-ATTR almost-IPFV
    'This one is more bent than that one.'

    'This one is bent, that one is almost straight.'

(309) a. Context: same as (307)

b. *wíːdiʔ ʔilkʼúnkʼuniʔaš*   *wíːdiʔ ʔilkʼúnkʼuniʔ*   *šemuyéːsaʔ*
    wiːdiʔ ʔil-kʼunkʼun-iʔ-aʔ-š wiːdiʔ ʔil-kʼunkʼun-iʔ   šemu-eːs-aʔ
    this   ATTR-bent-ATTR-AOR-SR this   ATTR-bent-ATTR   very-NEG-AOR
    'This one is more bent than that one.'

    'This one is bent, that one is not very bent.'

Once again, the addition of modifiers allows speakers to make distinctions that are not possible with the positive form alone. Such evidence reveals that the unmarked positive form shows the semantic behavior of the English positive form, even in comparison contexts.

In sum, based on Kennedy's tests, conjoined comparison in Washo is implicit comparison. This means that there is no evidence even for a covert comparative morpheme at work in these constructions.

5.4.2   The semantics of conjoined comparisons

The tests in the previous section showed that conjoined comparisons in Washo are infelicitous in crisp judgment contexts, and with absolute standard predicates. I argue that these properties are in fact special cases of a more general property of conjoined comparisons: they always receive

a norm-related interpretation. That is, the subject of each scalar predicate must hold the relevant property in an absolute sense in order for the comparison to be felicitously uttered. This property is not present in English *-er/more* comparatives. Upon hearing an utterance of the sentence in (310), we do not draw any inference that either the standard or target of comparison count as tall in an absolute sense.

(310)   John is taller than Bill.

      a.   ↛ Bill is tall.

      b.   ↛ John is tall.

On the standard degree-based analysis of English comparatives (Cresswell, 1976; von Stechow, 1984; Kennedy, 1997, among others), the lack of entailment to the positive form is captured by the fact that the comparative morpheme and a null degree operator that contributes the absolute interpretation (POS) are in complementary distribution. When the degree argument of the gradable predicate is not bound by the comparative or other degree morphology, the null morpheme POS enters the derivation, binding the open degree argument and contributing the absolute semantics. The semantics of POS in (312) ensures that the degree d to which x holds the relevant property G exceeds a standard for G, abbreviated here as s_G.

(311) $[\![\ tall\ ]\!] = \lambda d \lambda x.\textbf{height}(x) \succ d$

(312) $[\![\ \text{POS}\ ]\!] = \lambda G_{\langle d,\langle e,t\rangle\rangle} \lambda x \exists d[d \succ s_G \wedge G(d)(x)]$

Under this analysis, POS and the comparative morpheme are both members of a paradigm of degree morphemes that target the degree argument position of the gradable predicate, and cannot co-occur. Since it is POS that is responsible for the norm-related interpretation, and it is not present in comparatives like (310), we correctly predict a lack of entailments to the positive form.

I claim, however, that conjoined comparisons in Washo are obligatorily norm-related. That is, the predicates in both clauses receive norm-related interpretations. I informally model the truth conditions of the conjoined comparison (313) as in (314).

(313) *t'é:liwhu delkáykayiʔ*   *k'éʔi*   *šáwlamhu delkáyayiʔé:s*
       t'e:liwhu de-ʔil-kaykay-i?   k'-eʔ-i   šawlamhu de-ʔil-kaykay-iʔ-e:s
       man   NMLZ-ATTR-tall-ATTR 3-COP-IPFV girl   NMLZ-ATTR-tall-ATTR-NEG

       k'áʔaš
       k'-eʔ-aʔ-š
       3-COP-AOR-SR

       'The man is taller than the girl.'

       'The man is tall, the girl is not tall.'

(314) The man counts as tall, and the girl does not count as tall in the context of utterance.

This analysis captures the fact that there is no evidence for a comparative morpheme in con-
joined comparisons. The truth conditions of (313) are simply the conjunction of those of the two
conjoined clauses. Note that these truth conditions entail that the man is taller than the girl, thanks
to Consistency Constraint 1 (Klein, 1980; Kennedy, 2011), repeated in (315) from chapter 2.

(315) For any positive form gradable predicate g and object x, y and for any context c, if g holds
       of x but not of y in c, then x exceeds y relative to the scalar concept encoded by g.

That is, if the speaker is committed to the truth of *t'é:liwhu delkáykayiʔ k'éʔi* 'the man is tall', and
to the truth of *šáwlamhu delkáykayiʔé:s kéʔi* 'the girl is not tall', then it follows from (315) that
the speaker is also committed to the proposition that the man exceeds the girl in height.

The analysis in (314) is supported by the fact that conjoined comparisons in Washo are in-
felicitous in contexts where the positive form is false. A case in point is (316), which is judged
unacceptable in the described context, where both individuals clearly do not count as tall.

(316) a. Context: comparing a man who is five feet tall and a woman who is four and a half
           feet tall (i.e., both clearly fall under the negative extension of *tall*).

       b. # *t'é:liwhu delkáykayiʔ*   *k'éʔi*   *daʔmóʔmoʔ*
             t'e:liwhu de-ʔil-kaykay-i?   k'-eʔ-i   daʔmoʔmoʔ
             man   NMLZ-ATTR-tall-ATTR 3-COP-IPFV woman
             delkáykayiʔé:s   *k'áʔaš*
             de-ʔil-kaykay-i?-e:s   k'-eʔ-aʔ-š
             NMLZ-ATTR-tall-ATTR-NEG 3-COP-AOR-SR

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Intended: 'The man is taller than the woman.'

(lit: 'The man is tall, the woman is not tall.')

Under the hypothesis that conjoined comparisons always receive a norm-related interpretation, (316) is unacceptable in the given context because it is simply false.

A speaker can, however, circumvent this restriction by using a strategy that should by now be familiar, namely modification of the predicate. Two such examples are given in (317) and (318).

(317)   a. Context: comparing two small pinecones; both are clearly not big

       b. *wíːdiʔ behéziŋaš   lákʼaʔ wíːdiʔ tʼíːyeliʔ wéwši*
           wiːdiʔ beheziŋ-aʔ-š   lakʼaʔ wiːdiʔ tʼiːyeliʔ wewš-i
           this   small-AOR-SR one   this   big   almost-IPFV
           'This one is small, that one is a little bit big.'

(318)   a. Context: comparing two medium-sized pinecones, neither are big nor small

       b. *wíːdiʔ dewdíʔiš yáːkʼaʔ wíːdiʔ tʼíːyeliʔ šémuyéːs lákʼaʔ deltétebiʔ*
           wiːdiʔ dewdiʔiš yaːkʼaʔ wiːdiʔ tʼiːyeliʔ šemu-eːs lakʼaʔ de-ʔil-teteb-iʔ
           this   tree   cone   this   big   very-NEG one   NMLZ-ATTR-fat-ATTR
           wéwɨš
           wewš
           almost
           'This pinecone, this one is not very big, this one is sort of fat.'

At this point, there are two analytical possibilities for compositionally deriving the truth conditions of conjoined comparisons along with their norm-related entailments. First, we could assume that the standard analysis for deriving the positive form of adjectives in English (and likewise for adjectives in Luganda) carries over to scalar predicates in Washo as well. Under such an analysis, a scalar stem like *-kaykay-* 'tall' would denote a relation between degrees and individuals, and combines with the degree morpheme POS, which contributes the norm-related interpretation, and their properties with respect to vagueness. Since there is no comparative morpheme in such sentences, POS is necessary under this analysis in order to bind the open degree argument.

A second possibility would be to claim that, contra the standard analysis for English, scalar predicates in Washo directly lexicalize vague predicates. That is, a stem like *-kaykay-* 'tall' is

simply an $\langle e,t \rangle$ predicate that is true of an individual if it 'stands out' in height in the context of utterance.

I will eventually adopt the second position in the following chapter, after examining more evidence that points towards a vague predicate analysis for Washo scalar predicates. For now, I simply maintain that the truth conditions of conjoined comparisons should be modeled as in (314), with no comparative semantics directly encoded, and carrying a norm-related interpretation.

I close this section by noting that there appears to be variation in implicit comparisons with respect to the norm-related interpretation. While Washo conjoined comparisons necessarily carry a norm-related interpretation, implicit comparisons in English like (319) do not.

(319)   Compared to Bill, John is tall.

In fact, as pointed out by Sawada (2009), comparisons like (319) in English (and Japanese) actually carry the implicature that the two individuals are *not* tall (either short, or at least borderline cases). According to Sawada, this implicature is derived from a principle of economy. The idea is that if the target of comparison, in this case John, is already considered tall in the discourse context (relative to the set of adults), the use of (319) does not change the truth value of *John is tall*. The use of (319) then generates a relevance implicature that John is not tall with respect to the global comparison class (and likewise that Bill is even shorter).

The picture that emerges is that English *compared to* comparisons carry the implicature that neither individual holds the relevant property in the discourse context. By contrast, Washo conjoined comparisons are simply infelicitous in such contexts. We therefore observe cross-linguistic variation in the landscape of implicit comparisons based on whether they can manipulate the context of evaluation of the positive form. I tentatively suggest that this difference may be derived from the fact that English *compared to* comparisons are mono-clausal, while Washo conjoined comparisons are bi-clausal, the idea being that the calculation of the relevant comparison class happens once for each independent clause. Support for this view comes from analogous conjoined structures in English like (320), which entails that John is taller than Bill, but (at least according

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to my intuitions) can only be used if John counts as tall and Bill counts as short in the discourse context. That is, we do not observe the same context-narrowing effects in (320) that were observed with the *compared to* comparison in (319), in support of the view that the number of clauses at issue is relevant for restricting comparison classes.

(320)   John is tall, Bill is short.

However, a possible counter-example to this claim comes to us from Samoan, another language that makes use of conjoined comparison (Stassen, 1985).[9] For speakers that accept conjoined comparisons, these structures may be used even if the context is such that both individuals hold the property in question. For instance, (321) is a comparison of two large ships, while (322) is from a context where Alofa is 6'4", and Sulu is 6'2", both definitely tall.[10]

(321)   *Ua tele le   Queen Mary, ua la'itiiti le   Aquitania.*
         is   big the Queen Mary is small   the Aquitania
         'The *Queen Mary* is bigger than the *Aquitania*.'   (Marsack, 1975, p. 66)

(322)   a. Context: The tallest family members I have are my aunt Sulu and my brother Alofa.
             Both are quite tall. Sulu's height is 6'2", and Alofa is even 6'4".

         b. ? *E   maualuga Alofa, e   puupuu Sulu.*
             TAP high   Alofa TAP small Sulu
             'Alofa is taller than Sulu.'   (Hohaus, 2011, p. 7)

However, Hohaus (2011) argues that the positive form in Samoan has a slightly different interpretation than the positive form in English. Specifically, she argues that the positive has a comparative or superlative interpretation in all contexts. Accordingly, a literal translation of (322) might be

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9. Hohaus (2011), however, notes that conjoined comparison is not the primary means of comparison in Samoan, especially among younger speakers and Samoan émigrés, who prefer a type of explicit comparison.

10. The ? judgment for (322) comes from the original work, in which Hohaus intends to indicate that this sentence is odd for Samoan speakers who do not accept conjoined comparisons in any context. For all those speakers consulted who do accept conjoined comparisons, (322) is perfectly acceptable in the context described (Vera Hohaus, p.c.).

something along the lines of 'Alofa is taller, Sulu is smaller.' Thus, the variation observed between Washo and Samoan conjoined comparisons is likely derived from variation in the semantics of the positive form, rather than variation in whether a comparison class standard is calculated for each independent clause. In any case, the data from English, Washo, and Samoan reveal that there is much diversity in the typology of implicit comparisons. Further research is required to flesh out the sources and limits of this variation in implicit comparisons, both within and across languages.

5.5   The analysis of locative comparisons

In this section we turn to the analysis of locative comparison constructions in Washo. The results of applying Kennedy's (2007a) tests for explicit and implicit comparison are somewhat less straight-forward than in the case of conjoined comparisons. Nevertheless, I argue that locative comparisons should be analyzed as implicit comparisons. I provide an analysis whereby the comparison inter-pretation is derived as a conversational implicature, alongside which a coerced type-shift allows a gradable predicate to combine with a locative modifier. I also suggest that such an analysis may shed light on the typological frequency of locative comparisons, and their grammaticalization path.

5.5.1   *Locative comparisons are implicit comparisons*

Evidence for the status of locative comparisons as explicit or implicit comparison is mixed. According to the first test, only explicit comparison is felicitous in crisp judgment contexts. The comparisons in (323)-(324) were elicited in a context of comparing two ladders, with only a small difference in height between them. The only difference between (323) and (324) is the locative expression used: *lelew* 'beside' in (323), and *dulel* 'beyond' in (324). Both speakers accept (323) in this context, though there is speaker variation on whether (324) is acceptable.

(323)   a. Context: comparing two ladders, with only a small difference in height between them.

b. *wí:diʔ delkáykayiʔ   k'éʔi   wí:diʔ lélew*
wi:diʔ de-ʔil-kaykay-iʔ   k'-eʔ-i   wi:diʔ lelew
this   NMLZ-ATTR-tall-ATTR 3-COP-IPFV this   beside
'This one is taller than that one.'

(324)   a. Context: comparing two ladders, with only a small difference in height between them.

      b. ?? *wí:diʔ delkáykayiʔ   k'éʔi   wí:diʔ dúlel   hé:šiʔ*
        wi:diʔ de-ʔil-kaykay-iʔ   k'-eʔ-i   wi:diʔ dulel he:ši?
        this   NMLZ-ATTR-tall-ATTR 3-COP-IPFV this   beyond amount
        'This one is taller than that one.'

As we saw with conjoined comparisons, when speakers are asked to make comparisons in crisp judgment contexts, the comparisons offered involve adding hedges, as shown in (325)-(326) for a variety of locative morphemes.

(325)   a. Context: Comparing two ladders, with only a small difference in height between them.

      b. *wí:diʔ t'é:weʔ dewgíʔiš k'éʔi   wí:diʔ dúlel   hé:šiʔ   wéwɨš*
        wi:diʔ t'e:weʔ dewgiʔiš k'-eʔ-i   wi:diʔ dulel   he:ši? wewš
        this   much   height 3-COP-IPFV this   beyond amount almost
        'This one is tall, slightly beyond that one.'

(326)   a. Context: Comparing two small pinecones, one only slightly bigger than the other.

      b. *ʔí:yel wéwši   behézin lélew*
        ʔ-i:yel wewš-i   beheziŋ lelew
        3-big almost-IPFV small   beside
        'That one is almost big beside the small one.'

      c. *t'í:yeliʔ wéwɨš behéziŋa*
        t'i:yeliʔ wewš beheziŋ-a
        big   almost small-LOC
        'That one is almost big, by the small one.'

The second test is whether the comparison is acceptable with predicates with absolute standards. Here again, evidence is mixed. The comparison in (327) with *ʔilk'unk'uniʔ* 'bent' is judged acceptable with *lelew* 'beside', while the comparison with *lelew* with another absolute standard predicate *mi:p'il* 'full' in (328) is accepted by one speaker and judged unacceptable by another.

Meanwhile, (329) is judged unacceptable by both speakers, where the locative expression used is changed to *dulel* 'beyond'.

(327)   a. Context: comparing two nails, one more bent than the other (though both are bent)

        b. *wíːdiʔ ʔilkʼúnkʼuniʔi*   *wíːdiʔ lélew*
           wiːdiʔ ʔil-kʼunkʼun-iʔ-i   wiːdiʔ lelew
           this   ATTR-bent-ATTR-IPFV this   beside
           'This one is more bent than that one.'

(328)   a. Context: comparing two jars, one more full than the other (though neither are completely full)

        b. ?? *lákʼaʔ míːpʼili*   *lákʼaʔ lélew*
           lakʼaʔ miːpʼil-i   lakʼaʔ lelew
           one   full-IPFV one   beside
           'This one is more full than that one.'

(329)   a. Context: comparing two jars, one more full than the other (though neither are completely full)

        b. # *lákʼaʔ míːpʼili*   *lákʼaʔ dúlel*   *heši ʔ*
           lakʼaʔ miːpʼil-i   lakʼaʔ dulel   hešiʔ
           one   full-IPFV one   beyond amount
           Intended: 'This one is more full than that one.'

(330)   a. Context: comparing two jars, one more full than the other (though neither are completely full)

        b. # *wíːdiʔ kʼétep míːpʼili*   *wíːdiʔ ʔíwiʔ*
           wiːdiʔ kʼetep miːpʼil-i   wiːdiʔ ʔiwiʔ
           this   jar   full-IPFV this   over
           Intended: 'This jar is more full than that one.'

In sum, judgments on locative comparisons in the test cases for explicit versus implicit comparison seem to be somewhat mixed. In at least some cases, locative comparisons (especially those with *lelew* 'beside'), seem to behave like explicit comparison in certain respects, although the judgments are not as clear-cut as they are with conjoined comparisons. We may be tempted, therefore,

to hypothesize that locative markers may be lexicalizations of explicit comparison morphemes in Washo.

However, there is reason to believe that these locative markers are not really comparative morphemes after all. First, the existence of multiple (non-suppletive) comparison markers in a single language is highly unusual. To my knowledge, there are no languages that lexicalize multiple comparative morphemes.[11] There are indeed languages that distinguish different standard markers (see Pancheva 2006 for Slavic, and Merchant 2009, 2012 for Greek), but these cases track differences in the syntactic structure of the standard phrase and encode no semantic distinction.[12] However, there do not appear to be any syntactic differences between the types of standards selected by locative markers in Washo. They all select individual-denoting NPs, as would be expected from their use as locative and spatial adpositions more generally.

Second, as we have already observed in section 5.3.2, there is evidence that locative postpositions still retain their locative semantics even in comparison contexts. For instance, (331) is infelicitous in a context of comparing two ladders standing next to each other. The minimal pairs in (332) and (333), along with a speaker's volunteered comments, also show that the spatial configuration of the objects remains part of the interpretation of locative comparisons.

(331)   a.   Context: comparing two ladders standing next to each other

      b.   # *wíːdiʔ t'éweʔ dewgúliweʔ k'éʔi*   *wíːdiʔ ʔíwiʔ*
             wiːdiʔ t'eweʔ dewguliweʔ k'-eʔ-i   wiːdiʔ ʔiwiʔ
             this   much   height   3-COP-IPFV this   over

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11. The English comparative morphemes *-er/more* are taken to be allomorphs of a single underlying morpheme, and thus not an exception to this typological claim; see Embick (2007) for discussion, and an analysis of the alternation within the framework of Distributed Morphology.

12. Putting it this way is a bit too simplistic. For Pancheva, the distinction has a semantic reflex in that the two standard markers are assigned different semantics (the identity function, or a type-shifter). But this distinction has to do with her particular assumptions about the meaning of the comparative morpheme and its syntax. I will not go into the details of her analysis here. See further discussion on issues related to the semantics of standard markers in chapter 2.

Intended: 'This one is taller than that one.'

Speaker's comment: "You would only say that... if this tall ladder was maybe laying on top of this little short one."

(332) a. Context: comparing the lengths of a rope and a table, where the rope is lying beside the table

b. *bec'ílši? t'é:we? dewgí?iš té:bɨl lélew / #?íwi?*
bec'ilši? t'e:we? dewgi?iš te:bɨl lelew / ?iwi?
rope   much length   table beside / over
'The rope is longer than the table.'

Speaker's comment: "Maybe you put the rope across here . . . so it would be *by* the table . . . on the side."

(333) a. Context: comparing the lengths of a rope and a table, where the rope is lying on top of the table

b. *bec'ílši? t'é:we? dewgí?iš té:bɨl ?íwi? / #lélew*
bec'ilši? t'e:we? dewgi?iš te:bɨl ?iwi? / lelew
rope   much length   table over / beside
'The rope is longer than the table.'

Speaker's comment: "That means up on top of here." (points to the top of the table)

I therefore argue that these types of sentences are not ambiguous between comparative and locative uses. That is, these locative markers do not have distinct locative and comparative semantics. Rather, they are primarily locatives that encode a certain spatial relation between individuals, and a comparison between two objects may be inferred in certain contexts. I propose that the locative markers have only a spatial semantics in their lexical entries, and that the interpretation of these sentences as comparisons is an implicature. I claim that the observed variability in acceptability of certain locative comparisons is derived from the fact that the comparison interpretation is an implicature, which a speaker can fail to calculate. The consequence of this claim is that locative comparisons in Washo are nevertheless instances of implicit comparison, despite the varied

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results from applying Kennedy's tests. In the following section, I present an analysis of locative comparisons as pragmatically derived from a purely locative semantics.

5.5.2 *Locative comparison via pragmatic implicature*

As stated in the previous subsection, I want to argue that the comparison interpretation of locative constructions in Washo is derived by pragmatic implicature, and not by a comparative morpheme. The main idea is the following: the PPs that introduce the standard of comparison have a purely locative semantics, but this meaning is incompatible with stative predicates like *ʔilkaykayiʔ* 'tall', leading discourse participants to derive an implicature of comparison. The combination of a stative predicate and locative modifier also coerces a type-shift in the stative predicate, which allows composition to proceed. I argue that such an operation may be the basis of a cross-linguistically common path of grammaticalization from locative adposition to comparative standard marker.

5.5.2.1 The basis for deriving a comparison implicature

Intuitively, the semantic contribution of a locative PP is the encoding of some sort of spatial relation between two individuals (e.g. Kratzer, 1995; Zwarts, 1997; Zwarts & Winter, 2000; Maienborn, 2001). Under this assumption, the truth conditions of a sentence like (334) could informally be stated as in (335):

(334) *t'éːliwhu ʔilkáykayiʔi   šáwlamhu lélew*
       t'eːliwhu ʔil-kaykay-iʔ-i   šawlamhu lelew
       man   ATTR-tall-ATTR-IPFV girl   beside
       'The man is tall, beside the girl.'

(335) ⟦ (334) ⟧^{c} = 1 iff *tall*(man) in c & *beside*(man, girl) in c

Truth conditions in (335) state that (334) is true just in case the man counts as tall, and is beside the girl.

This picture, however, is too simple. The main problem comes to us from an observation in the literature that stative predicates generally resist locative modification (Kratzer, 1995; Maienborn, 2001). The reason is that stative predicates name properties that are spatio-temporally stable. Since such predicates hold across times and locations, locative modification is generally redundant and infelicitous. Nevertheless, Washo speakers produce sentences like (334) as a strategy for making a comparison between two individuals. Assuming that speakers do not offer ungrammatical or infelicitous sentences in elicitation (cf. Matthewson 2004 and the methodology section of chapter 1), what needs to be explained is why locative PPs can modify stative predicates, and why the resulting interpretation is one of comparison.

I propose that the use of a locative modifier with a state description gives rise to an invited pragmatic inference, which can be modeled in terms of a Gricean conversational implicature (Grice, 1975). The derivation of this implicature is as follows. The hearer observes that the speaker is making a claim about an individual x using a stative predicate Q, with the added restriction imposed by the locative modifier. Since Q is a spatio-temporally stable predicate, the truth of $Q(x)$ does not change across locations, rendering locative modification redundant (i.e., violating the maxim of Relation).[13] Since the hearer assumes that the speaker must be behaving cooperatively, s/he infers that the speaker intends that the assertion of the spatial configuration of the two individuals is somehow relevant. The inference then arises that $Q(x)$ only holds when considering x in a particular spatial relation to y. That is, the use of the spatial/locative modifier acts as a context-setter for the evaluation of the stative predicate: the hearer is invited to evaluate the truth of $Q(x)$ with respect to the special context containing x and y in a particular spatial relation.

Support for this view of implicature calculation with locative modifiers of statives comes from recent work by Ernst (2011). Ernst proposes that locative modification of statives can be licensed in a particular utterance context if some other communicative function is at issue rather than simply asserting that a state only holds in some particular location. He explains cases of felicitous uses of

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13. Grice also considers the possibility that redundancy (i.e., being over-informative) is a violation of Quantity.

locatives modifying statives as in (336) as cases of domain restriction and/or contrast.

(336)   a. Her eyes are green right next to the house (but more grayish out in the open).

   b. The cupcakes were really big at a coffee shop I stopped at this morning!

Whereas locative modification of statives is typically infelicitous due to being redundant, Ernst argues that in cases like (336) the locative modifier is used as a "frame-setting" modifier in the sense of Maienborn (2001), restricting the contexts for evaluating the predicate. The felicity of locative modification of statives thus rests on an extra pragmatic licensing mechanism, not unlike what I propose for Washo locative comparisons.

The question remains, however, as to why such extra pragmatic reasoning should give rise to an interpretation of comparison. I suggest that this is because the object of the locative marker can readily be interpreted as a standard of comparison. In locative statements, the object of the adposition names the reference object of the locative relation (Zwarts, 1997). From this point, it is a small step to interpret the object of the adposition as a standard of comparison for evaluating a scalar predicate, especially when both individuals in the sentence form a plausible comparison class.

The upshot of the implicature-based analysis of locative comparisons is that it can account for the variability in speaker judgments that we observed in section 5.5.1. Since implicature calculation is not a deterministic algorithm, the hearer can fail to draw the relevant inference even if it is intended by the speaker.

5.5.2.2   Coercing a type shift

The analysis of Washo locative comparisons argued for here relies on a pragmatic inference to derive the comparison interpretation from sentences containing stative predicates with locative modifiers. Specifically, the implicature arises because locative modification of stative predicates is otherwise redundant. However, semantic analyses of locative modification typically attribute

the anomaly of locative modifiers with stative predicates as a type-theoretical problem of semantic composition, rather than simply a pragmatic infelicity.

This restriction can be cached out formally by the hypothesis that stative predicates lack eventuality arguments. Under this view, locative modification of statives is anomalous since locative PPs specify something about a predicate's eventuality argument, which is lacking in stative predicates (Kratzer, 1995; Maienborn, 2001). The simplified schema for locative modification in (337) is adapted from Maienborn (2001), where LOC stands in for some locative relation. The operation of locative modification cannot apply to a stative predicate like *tall*, since it has no eventuality argument.[14]

(337)   Semantic template for (external) locative modifiers

   a. $[\![\,\text{VP}\,]\!] = \lambda e.event.type(e)\ \&\ \ldots$

   b. $[\![\,\text{PP}_{loc}\,]\!] = \lambda e.\text{LOC}(e,location)$

   c. $[\![\,[_{VP}\,\text{PP}_{loc}\,[_{VP}\,\ldots\,]\,]\,]\!] = \lambda e.event.type(e)\ \&\ \ldots\ \&\ \text{LOC}(e,location)$
        (via Predicate Modification)

Thus, the problem for combining stative predicates and locative PPs runs deeper than pragmatic infelicity. There is also a genuinely semantic problem: the derivation of such structures crashes since stative predicates are not the right type to be modified by locative PPs. For sentences like (334) to be interpretable at all, this type clash must be fixed.

Two options are in principle available for fixing the semantic composition problem: type-shifting the PP, or type-shifting the stative predicate. In pursuing the first option, one way of fixing the type mismatch would be to shift the PP from an event predicate meaning as in (337b) to one of a propositional modifier, along the lines of (338):

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14. The schema in (337) is highly simplified, abstracting away from Maienborn's distinction between internal and external modifiers. However, since both types of modifiers depend on an eventuality argument to operate over, the combinatorial problem arises in both cases.

(338) $\text{PP}_{loc} : \langle \varepsilon, t \rangle \rightsquigarrow \langle st, st \rangle$

Such an analysis is essentially what Beck et al. (2004) propose for the interpretation of comparisons in Japanese, where the standard of comparison is introduced by the postposition *yori*, as in (339). This postposition historically had a wider use as a source postposition, though in Modern Japanese is only used for comparison (Sawada, 2008b).[15] Beck et al. argue that the function of the *yori* phrase does not contribute to the semantic composition of the comparative, but rather serves the pragmatic function of narrowing down the comparison class relative to which Tokyo's warmth is evaluated. The comparison interpretation of the sentence is derived as shown in (340)-(342):

(339) *Tokyo-wa   Sapporo-yori atatakai.*
       Tokyo-TOP Sapporo-from warm
       'It is warmer in Tokyo than in Sapporo.'

(340) $[\![\textit{Tokyo-wa atatakai}]\!] = \lambda w. \exists d [\text{Tokyo is } d\text{-warm in } w \ \& \ d > c]$

$\qquad\qquad\qquad$ (where c is a free variable derived from context)

(341) $[\![\textit{Sapporo-yori}]\!] = \lambda p_{\langle s,t \rangle} \lambda w. p(w) \wedge \exists c [c = \text{a contextually determined degree associated}$
       with Sapporo $\approx$ Sapporo's warmth]

(342) $[\![(339)]\!] = \lambda w. \exists d \exists c [\text{Tokyo is } d\text{-warm in } w \ \& \ d > c]$ (where c = a contextually determined
       degree associated with Sapporo $\approx$ Sapporo's warmth)

Kennedy (2007a), however, forcefully argues against such an analysis for Japanese *yori* comparatives, precisely because it wrongly predicts that these structures should behave like implicit comparisons. Kennedy shows that *yori* comparisons do in fact behave like explicit comparisons, and therefore argues for an analysis with a comparative operator that semantically introduces the standard, which must be individual-denoting. However, since I argue that locative comparisons in

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15. Thus, Beck et al. (2004) do not propose a type-shift for *yori*-phrases in Modern Japanese, but rather claim that synchronically PPs headed by *yori* always operate at the propositional level.

Washo are in fact implicit comparisons, an analysis along the lines of (340)-(342) is plausible for these structures, provided we are willing to treat the locative PPs as propositional modifiers.

The second option to resolve the compositional problem of locative modifiers of stative predicates would be to shift the meaning of the stative predicate to one that allows it to accept locative modification. Specifically, this would involve shifting the meaning of stative predicates to include an eventuality argument, as in (343):

(343) $\text{VP}_{stative} : \langle e,t \rangle \rightsquigarrow \langle e, \langle \varepsilon, t \rangle \rangle$

Under this analysis, the stative predicate receives an eventuality argument, which can now be targeted for locative modification. The truth conditions for the locative comparison in (334), repeated below in (344), can now be derived as in (345)-(347):

(344)   *t'é:liwhu ʔilkáykayiʔi*   *šáwlamhu lélew*
       t'e:liwhu ʔil-kaykay-iʔ-i   šawlamhu lelew
       man   ATTR-tall-ATTR-IPFV girl   beside
       'The man is tall, beside the girl.'

(345) $[\![$ *ʔilkaykayiʔ*$_{shifted}$ $]\!] = \lambda x \lambda e.x$ counts as *tall* in e

(346) $[\![$ *šawlamhu lelew* $]\!] = \lambda e.beside.the.girl(e)$

(347) $[\![$ (344) $]\!] =$ the man counts as *tall* in e & *beside.the.girl*(e)

One argument for preferring the type-shift in (343) over the one in (338) is the fact that shifting the meaning of the predicate means that the meaning of the PP stays constant in both comparison and non-comparison contexts. This accords better with the Washo facts presented in this section, whereby the locative relation is required to hold between the individuals, even under the comparison interpretation. Furthermore, the type shift in (343) in some sense seems more plausible than the one in (338). In (343), the speaker need only add an extra argument in order for the semantic composition to proceed. By contrast, the shift in (338) requires the speaker to reanalyze the PP as a completely different semantic type (from event modifier to propositional modifier). Perhaps this

shift is not so far-fetched, but in any case, the interpretation of Washo locative comparisons seems to favor (343) over (338).

Interestingly, the analysis of shifting stative predicates to incorporate an eventuality argument converges on two recent analyses of gradable predicates and comparison, whereby gradable predicates denote relations between individuals and eventualities, rather than degrees. The first comes from Erlewine's (2007) analysis of Mandarin *bi* comparatives. Erlewine argues that the comparative morpheme *bi* in Mandarin has a verbal syntax (specifically that of a *v* head), and correspondingly gives *bi* comparatives in a "verby" semantics as well, namely incorporating eventuality arguments. Under this analysis, gradable predicates are type $\langle e, \langle \varepsilon, t \rangle \rangle$, and *bi* comparatives are analyzed as comparing "event intensity" rather than degrees. A strikingly similar approach to gradable predicates is advanced by Anderson & Morzycki (To appear), who argue that the notion of degrees can be reduced to state kinds, and render the semantic type of gradable predicates as $\langle e, \langle \varepsilon_{state}, t \rangle \rangle$. Their arguments are based on the observation that it is quite common for languages to display manner-degree homophony (e.g. the English question word *how* can be used for both manner and degree questions). They propose a unified analysis for these cases by claiming that manners are (non-stative) event kinds, while degrees are state kinds.

These analyses therefore offer some independent plausibility of the type shift proposed here for Washo locative comparisons. However, whereas under Erlewine's and Anderson & Morzycki's analyses the eventuality argument is grammaticalized as part of the conventional meaning of gradable predicates, I maintain that this is not the case for Washo and that the coerced type-shift is desirable in this case. The main argument comes from the fact that Erlewine's and Anderson & Morzycki's analyses are meant to replace a degree-based analysis of comparatives and gradable predicates, and specifically they are intended to capture the fact that comparisons in the languages they consider are always explicit comparisons in Kennedy's sense. Since this is not the case for Washo locative comparisons, I maintain that gradable predicates in this language do not lexicalize the eventuality argument, but rather it must be coerced to allow locative modification "on the fly."

This accounts for the observed variability of speaker judgments regarding locative comparisons, since it requires extra work on the part of the hearer to interpret locative modification of stative predicates as a comparison.

A third possibility for accounting for the double duty of locative PPs in comparisons and as true locative expressions would be to consider an analysis within the framework of Vector Space Semantics (VSS; Zwarts 1997; Zwarts & Winter 2000). This framework was originally developed to account for the semantics of spatial and locative PPs, and has since been adopted for the analysis of gradable predicates and comparatives (Faller, 2000; Winter, 2005; Schwarzschild, 2012b). The basic idea is this: under this framework, PPs denote sets of vectors of a certain orientation (e.g. pointing away from the house in the PP *outside of the house*). Gradable predicates are then analyzed as sets of vectors along some dimension (e.g. height). Whereas Faller (2000) and Winter (2005) adopt a VSS analysis for English comparatives, Schwarzschild (2012b) capitalizes on the fact that it is typologically quite common for languages to use one and the same adposition for both location and comparison, and shows how the VSS analysis can be adopted quite fruitfully for locative comparison languages like Navajo, Hindi, and Japanese.

However, there are two main reasons why I do not pursue such an analysis here. First, one of the main benefits of adopting a VSS analysis for gradable predicates as well is the fact that it can account for measure phrase modification in both domains (cf. *10 feet outside/*near the house*, *5 feet tall/*short*). Namely, measure phrases can only combine with sets of vectors that are both upward and downward monotone (Winter, 2005). However, as we will see in the following chapter, Washo has no true measure phrases, so it is difficult to test the predictions of the VSS analysis in this language. Second, and more importantly, the VSS analysis of comparatives is essentially a degree analysis under a different guise, and is designed to account for explicit comparisons. While it may be possible to extend the VSS analysis to account for implicit comparisons as well (and it should, since implicit comparisons exist in English as well), I leave further exploration of this possibility to future research.

To summarize, locative comparisons in Washo are implicit comparisons whose interpretations are derived pragmatically and through a coerced type-shifting mechanism. Whereas the comparison interpretation is a pragmatic inference derived from a violation of the maxim of Relation, the semantic composition of this construction requires a coerced type shift to allow a locative PP to combine with a stative predicate. In the following subsection, I speculate that this operation may serve as the basis for the grammaticalization of comparative morphemes derived from spatial and locative elements, accounting for cross-linguistic pervasiveness of this pattern.

5.5.2.3 The basis for a semantic change

I speculate that we may be witnessing the beginning stages of the grammaticalization of an explicit comparative construction in Washo. While there has been relatively little research on the historical development of comparative morphemes, the observation that locative comparison makes up the largest class of comparative constructions in Stassen's (1985) typology is certainly suggestive. As Sawada (2008b) has shown, Japanese *yori* was historically a postposition with various spatial/locative uses, and is today a full-fledged comparative morpheme. Another particularly interesting case is that of Samoan, which is reported by Stassen to be a conjoined comparison language. Marsack (1975) and Hohaus (2011), however, observe that conjoined comparison is only used by older generations, while younger speakers find such constructions antiquated. In fact, many Samoan speakers now prefer to express comparison using a directional particle *atu*, which is ambiguous between comparative and directional uses (Hohaus, 2011).

The implicature-based account of locative comparisons accords well with the idea that this is an instance of grammaticalization in progress. According to Hopper & Traugott (2003) and Eckardt (2006), diachronic semantic change takes place in the following steps:

(348) a. A linguistic item L possesses coded meaning M_1

      b. *L* begins to be used in utterances that give rise to invited pragmatic inferences

      c. Speakers begin to exploit these invited inferences in novel situations

d. The invited inference begins to be conventionally associated with the use of *L*

e. The conventionalized inference becomes part of the coded meaning of *L*, resulting in an ambiguity between meaning M_1 and new meaning M_2

Under this view, Washo would be at stage (348b), where locative markers come to be used in utterances that invite interlocutors to draw an implicature. Meanwhile, Japanese would be a language where this cycle has been completed, whereby *yori* has completed the entire semantic change from locative postposition to comparative standard marker. There is also some evidence that Washo may be at the beginning of stage (348c), where the inference of comparison is invited in novel situations. This evidence comes from comparisons not involving stative predicates, as shown in (349). These comparisons are subject to much variation in acceptability between and within speakers, which suggests that the comparison inference is still not conventionalized, lending further support for the pragmatic account advocated for in this chapter. However, to the extent that such sentences are acceptable as comparisons, it shows that speakers are beginning to generalize the invited implicatures, expanding the use of locatives to non-stative predicates with the intention of expressing comparison.

(349) ?? *tulí:ši? lí:pgiši*   *géwe* **ʔíwiʔ**
        tuli:ši? lïp-giš-i   gewe   ʔiwiʔ
        wolf   run-AUX-IPFV   coyote over
        'The wolf is running faster than the coyote.'

Of course, drawing any definitive conclusions about language change in progress in this case must remain highly speculative, at best. Given the fact that Washo is highly endangered, and that there is no documentation of comparison constructions for previous time slices of the language, the hypothesis that we may be witnessing a change in progress unfortunately cannot be tested. I simply remark that the inference-based analysis of locative comparisons given in this section, taken together with a pragmatic account of semantic change in (348) and the typological facts certainly suggest that there may be a relevant connection here.

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5.6   A look ahead

In this chapter, we have examined the semantics of two comparison constructions in Washo: conjoined comparisons; and locative comparisons. I argued that both types of comparison are implicit comparisons, i.e., there is no dedicated comparative morpheme that contributes a semantics of comparison in either of these constructions. In the case of conjoined comparisons, a comparative interpretation of these sentences falls out from general principles of the interpretation of the positive form of gradable predicates. In the case of locative comparisons, the comparison interpretation is an invited inference derived from the apparent flouting of the Gricean maxim of Relation, accompanied by a coerced type-shift to allow a locative modifier to operate over an eventuality argument of the scalar predicate.

We have thus arrived at a situation where we seem to have no evidence for a comparative morpheme in Washo at all. This echoes the conclusion of Beck et al. (2009), who claim that Motu, an Austronesian language that also uses conjoined comparison, does not make use of a comparative morpheme. Just like we observed for conjoined comparisons in Washo, those in Motu are also unacceptable in crisp-judgment contexts. Beck et al. also claim that Motu also lacks other morphemes that correspond to degree morphology in a language like English.[16] They propose that the reason for the lack of degree morphemes in Motu is that gradable predicates in this language do not lexicalize degree arguments, but rather are simply vague predicates of type $\langle e,t \rangle$. Their proposal is formalized as a parameter on whether languages lexicalize degree arguments in gradable predicates or not:

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16. However, in the appendix of their paper, Beck et al. give the following Motu sentence, which contains a differential measure phrase, and the word *hanaia*, which is glossed as 'exceed' (p. 49).

(1) *Mary na   2cm ai Frank ena lata   e   hanaia.*
     Mary TOP 2cm by Frank his height 3.SG.SUBJ exceed
     'Mary is 2 cm taller than Frank.'   (Motu; Beck et al. 2009, p. 49)

.

(350) Degree Semantics Parameter:

A language {does/does not} have gradable predicates (type $\langle d, \langle e,t \rangle \rangle$ and related), i.e. lexical items that introduce degree arguments.   (Beck et al., 2009, p. 19)

Given the hypothesis that degree morphology like the comparative targets the degree argument position, a lack of degree arguments entails a lack of degree morphology. That is, according to the hypothesis in (350), the lack of comparative morphology in Motu is not simply an accidental gap in the inventory of functional degree morphology; rather, it is a systematic gap due to variation in the lexical semantics of gradable predicates.

The methodology of Beck et al. involved a medium-depth survey of a medium-sized pool of languages, at 14. Their investigation consisted of going through a questionnaire with native speakers of a variety of languages, rather than conducting sustained fieldwork on any particular language over a longer period of time. Furthermore, Motu was the only apparent outlier among the 14 languages investigated in their survey, and which formed the basis for positing the Degree Semantics Parameter. Therefore, it is legitimate to question whether (350), or something like it, is really an active parameter in natural language to account for cross-linguistic variation.

Given that Washo is a language that also lacks comparative morphology, and that detailed, sustained fieldwork *has* been carried out in this domain for this language, we are in the perfect position to test the parameter proposed in (350). I take up this challenge in the next chapter by investigating other putative degree constructions in Washo. It will be shown that Washo indeed lacks other degree constructions, including measure phrases, degree adverbs, equatives, and superlatives. The Washo data therefore give cross-linguistic support to the idea that languages may not lexicalize degree arguments in gradable predicates, and that this lexical variation is the source of the observed variation in degree morphology across languages.

Chapter 6

DEGREE-LESS GRADABLE PREDICATES IN WASHO

6.1   Introduction

In the previous chapter, I argued that Washo has no comparative morpheme. The comparative inter-
pretations of conjoined and locative comparisons are instead derived via inferences. We therefore
found a point of variation in degree constructions across languages, specifically in the inventory of
functional degree morphology. Of course, the inventory of functional categories is a place where
we often find variation, as much work in typology and, more recently, cross-linguistic semantics
has shown (e.g., tenses, determiners, evidentials, etc.; cf. discussion in chapter 1).

However, at the end of chapter 5, I suggested that we pursue a hypothesis whereby the observed
variation in Washo comparison constructions is not treated as an accidental gap, but rather due to
variation in the lexical semantics of gradable predicates. Specifically, whereas gradable predicates
in English (and Luganda, and many other languages) denote relations between individuals and
degrees as in (351), those in Washo are simply context-sensitive vague predicates, as in (352):

(351) $[\![tall_{English}]\!] = \lambda d \lambda x. \textbf{height}(x) \succeq d$

(352) $[\![tall_{Washo}]\!]^c = \lambda x. x$ counts as tall in c

This hypothesis is inspired by Beck et al. (2009), who propose that gradable predicates in
Motu are also of the type in (352). Like Washo, Motu also uses conjoined comparison, and Beck
et al. argue that there is no comparative morpheme in Motu either. However, treating the lexical
semantic differences between English and Washo in this way makes even stronger predictions
about degree morphology in the two languages. Namely, there is a prediction that there should
be no true degree morphemes in languages like Washo, that is, morphology whose function is
to specify something about the degree argument of a gradable predicate like (351). This would
include measure phrases, degree adverbs, and superlative and equative morphemes. Recall as well

from chapter 2 that In the case where there is no overt degree morphology present, a silent degree morpheme POS must apply to (351) to bind the degree variable and contribute the norm-related interpretation. Under the analysis in (352), however, no recourse to POS is necessary: the meaning in (352) essentially lexicalizes the meaning of gradable adjectives in languages like English after they have combined with POS. This means that the aspects of meaning of the positive form of gradable adjectives in English that derive from POS, including reference to comparison classes, different types of standards, and norm-relatedness, are already lexicalized directly into gradable predicates in Washo.

In this chapter, I pursue the hypothesis that gradable predicates in Washo have the lexical semantics in (352), and test the prediction that all other degree morphology should be absent in this language. It will be shown that Washo not only lacks a comparative morpheme, but all other degree morphology as well, lending support to the hypothesis that gradable predicates in this language lack a degree argument. In sections 6.2-6.4 I discuss measure phrases, degree modifiers, equatives, and superlatives in turn. Then in section 6.5 I examine preliminary evidence from degree achievement verbs that also lends support to this hypothesis. In section 6.6 I present two alternative hypotheses to account for the data, and show why these alternatives are theoretically and empirically inadequate. Section 6.7 concludes.

6.2   No measure phrases

Measure phrases like *five feet* in *five feet tall* are members of the class of degree morphemes in a language like English. In Kennedy & McNally's (2005) account, measure phrases denote functions from gradable adjective meanings to predicates of individuals by binding the degree argument and placing a restriction on the value that degree. Elsewhere in the literature, they are taken to denote degrees or sets of degrees or intervals (von Stechow, 1984; Heim, 2001; Schwarzschild, 2002, 2005; Svenonius & Kennedy, 2006). In any case, a key component of this style of analysis is that the measure phrase targets a degree position associated with the gradable predicate. It

follows, then, that if gradable predicates in a language do not lexicalize degree arguments, then their combination with measure phrases will not be licensed. This prediction is upheld in Washo.

It is of course well-known that the inventory and behavior of measure phrases cross-linguistically is quite idiosyncratic (Schwarzschild, 2005, among others). Thus, testing for and detecting measure phrases in a field situation can be quite difficult. In my investigations, the only example of anything measure phrase-like are phrases that name a number of years, an example of which is in (353):

(353) *hélmeʔ múʔc'im dewgálisiʔ*   *k'éʔi*
     helmeʔ muʔc'im de-w-galis-iʔ   k'-eʔ-i
     three   ten   NMLZ-STATIC-winter-ATTR 3.SBJ-COP-IPFV
     'He is thirty years old.'

In this example, a putative measure phrase *helmeʔ muʔc'im dewgalisiʔ* 'thirty years' occurs in a copula construction, and there is no gradable predicate present in the sentence. Attempts to elicit measure phrases in combination with gradable predicates results in ungrammaticality, as shown in (354).

(354)   * *hélmeʔ múʔc'im dewgálisiʔ*   *Míleyi*
     helmeʔ muʔc'im de-w-galis-iʔ   Mile-i
     three   ten   NMLZ-STATIC-winter-ATTR old-IPFV
     Intended: 'He is thirty years old.'

Given that Washo does have numerals, perhaps a more accurate and enlightening generalization is that Washo does not lexicalize units of measurement. That is, Washo does not have any items such as *foot*, *meter*, *pound*, etc., that lexicalize conventionalized units of measurement along a dimension. To get around this lexical restriction, Washo speakers can use a verb *wgiʔiš-*, which takes a numeral as a direct object, but does not specify a particular dimension upon which a measurement is based. I tentatively gloss this verb as 'measure'. This verb can be used whenever some particular dimension is made salient in the context, as shown in (355)-(357).

(355)   a. Context: talking about people's heights

b. *dubáldiʔ wewgíʔiši*
dubaldiʔ w-wgiʔiš-i
five   STATIC-measure-IPFV
'He is five feet tall.'

Possibly: "He measures five."

(356)   a.   Context: talking about a heavy bag

      b.   *lák'aʔ múʔc'im wewgíʔiši*
lak'aʔ muʔc'im w-wgiʔiš-i
one   ten   STATIC-measure-IPFV
'It weighs ten pounds.'

Possibly: "It measures ten."

(357)   a.   Context: talking about the weather

      b.   *hélmeʔ múʔc'im wewgíʔiši*
helmeʔ muʔc'im w-wgiʔiš-i
three   ten   STATIC-measure-IPFV
'It's thirty degrees.'

Possibly: "It measures thirty."

Additionally, we also find this verb appearing with the quantifier *t'éːweʔ* 'much/a lot', as in (358), where the verb is also in a nominalized form:

(358)   *téːbɨl t'éːweʔ dewgíʔiš*   *k'éʔi*
teːbɨl t'eːweʔ de-wgiʔiš   k'-eʔ-i
table much   NMLZ-measure   3-COP-IPFV
'The table is long.'

I tentatively analyze *wgiʔiš-* as a relation between individuals and numerals or amounts, but which is underspecified for a dimension of measurement, as in (359):

(359)   ⟦ *wgiʔiš-* ⟧^{c} = $\lambda n \lambda x.x$ measures n units on a salient dimension in c

More investigation is required to determine whether this is the correct analysis of this verb, or whether it has a more general meaning referring to cardinalities or amounts. Of course, the tricky

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part here is pinning down what exactly it means to say that '*x* measures *n* units'. One possibility is that this verb has to do with cardinalities more generally, though the following example suggests that this is not quite on the right track, where the intended measurement is simply based on quantity:

(360) a. Context: I see a group of people and ask you how many people are there. You respond:

    b.   # *lák'aʔ múʔc'im wewgíʔiši*
         lak'aʔ muʔc'im w-wgiʔiš-i
         one   ten   STATIC-measure-IPFV
         Intended: 'There are ten.' / 'They measure ten.'

    c. *lák'aʔ múʔc'im dáː   ʔéʔi*
        lak'aʔ muʔc'im daː   ʔ-eʔ-i
        one   ten   there 3-COP-IPFV
        'There are ten there.'

Perhaps, though, (360b) is simply blocked by the fact that one can just say (360c) instead.

Another issue has to do with the semantic type of numerals. Kennedy (2013) has recently argued that numerals are in fact degree expressions. If this is the case, then the semantics in (359) is remarkably parallel to that of gradable predicates in languages like English, cf. (351). We would then have evidence for degree arguments being lexicalized in some natural language expressions in Washo. The claim, then, would not be that Washo lacks reference to degrees entirely, but simply that gradable predicates in this languages do not have degree arguments.

There is at least one other verb that seems to behave parallel with *wgiʔiš-*, which is *wgohad-*. This verb, as shown in (361), also appears with *t'éːweʔ* 'much', and is typically used for describing widths.

(361)   *ʔitgéːgel   t'éːweʔ wewgóːhadi*
        ʔit-geːgel   t'eːweʔ w-wgohad-i
        INS.NMLZ-sit much   STATIC-wide-IPFV
        'The couch is wide.'

The verbs that behave this way seem to be quite limited in Washo. These are the only two I am

aware of. Even if further fieldwork uncovers more examples, I suspect these would remain a closed class.

In sum, the combination of measure phrases with gradable predicates in Washo is ungrammatical, and in fact true measure phrases seem not to exist at all in the language. This fact is consistent with, and expected under, the hypothesis that gradable predicates in Washo do not have degree arguments.

Before moving on, two more comments on measure phrases is in order. The first is that it is typologically common that languages disallow measure phrases in combination with the absolute form of gradable predicates, but nevertheless allow measure phrases with (explicit) comparatives, where they receive a differential interpretation (Schwarzschild, 2005; Grano & Kennedy, 2012). Since Washo lacks explicit comparisons, it follows that differential measure phrases are also not found in this language. Second, measure phrases are also commonly found with certain prepositional phrases (Zwarts, 1997; Zwarts & Winter, 2000). Attempts to elicit such structures in Washo, even with nonce measure phrases (e.g. *Beverly is three people ahead of me in line*), have met with some difficulty, and more thorough investigation must be left to future research.

6.3   Distribution of modifiers

The distribution of degree modifiers is sensitive to scale structure, i.e., the set of degrees associated with a scalar predicate, and the type of standard encoded (Rotstein & Winter, 2004; Kennedy & McNally, 2005, see discussion in chapter 2). For instance in English, the degree modifier *very* modifies scalar predicates with relative standards, which usually coincides with a scale structure lacking maximum and minimum elements.[1] Meanwhile, the degree modifier *completely* only modifies predicates with maximum standards, whose set of degrees includes a maximum value. That is, scale structure is responsible for the distributional differences between these two modifiers, as

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1. Modulo relative uses of maximum and minimum standard predicates; see Kennedy & McNally (2005) for discussion.

observed in (362)-(363).

(362)   The bottle is very tall/#closed.

(363)   The bottle is completely closed/#tall.

If gradable predicates in Washo do not make use of degrees, we expect putative 'degree' modifiers not to show this type of sensitivity to scale structure, since scale structure by hypothesis consists of a set of degrees. This is precisely what is observed. Following Beltrama & Bochnak (To appear), I argue that a wide distribution and somewhat variable interpretation across uses are the hallmarks of non-degree modification. Rather, such modifiers operate over $\langle e,t \rangle$ predicates, vague and precise alike, and do not make any reference to degrees. In this section I present a case study of the modifier *šemu*, which is often translated as 'very', but has a much wider distribution and somewhat variable interpretation across its uses.[2]

6.3.1   The distribution and interpretation of *šemu*

First, we observe in (364)-(366) that *šemu* can be used as an apparent intensifier for scalar predicates of all scale types, no matter whether they encode relative or absolute standards. Its distribution is not limited to relative-standard predicates the way English *very* is. When *šemu* combines with non-relative standard predicates, a more appropriate translation is 'really', which in English has a much wider distribution that *very*.

(364)   *delkáykayiʔ*   *šému*
        de-ʔil-kaykay-iʔ   šemu
        NMLZ-ATTR-tall-ATTR ŠEMU
        'very tall'   (relative standard predicate)

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2. Another modifiers in Washo that shows a similar distributional pattern and variable interpretations across uses is *wewš*, which is usually translated as 'slightly' or 'almost'. A detailed analysis other modifiers is left to another occasion. However, a promising starting point may find its roots in recent work by Anderson (2013), who aims to capture the cross-categoriality of the English modifier *sorta*, which is used as a hedge and combines with gradable and non-gradable predicates alike.

(365) ʔilšíːšibiʔ   šému
      ʔil-šiːšib-iʔ   šemu
      ATTR-straight-ATTR ŠEMU
      'really straight'   (maximum standard predicate)

(366) ʔilk'únk'uniʔ   šému
      ʔil-k'unk'un-iʔ   šemu
      ATTR-bent-ATTR ŠEMU
      'really bent'   (minimum standard predicate)

As we just observed in (362)-(363), degree adverbs typically have a more restricted distribution with gradable predicates, depending on the type of standard. In this respect, *šemu* seems to behave quite differently.

Second, *šemu* can be used as a modifier of verbs and nouns generally, and can even modify numerals. Such behavior would be surprising if *šemu* were a true degree modifier, assuming that verbs and nouns generally do not have degree arguments.

(367) *lák'aʔ láːdu   yáha šémuyi*
      lak'aʔ le-aːdu   yaha šemu-i
      one   1.POSS-hand hurt ŠEMU-IPFV
      'One of my hands really hurts.'

(368) *t'éːliwhu dókto šému k'éʔi*
      t'eːliwhu dokto šemu k'-eʔ-i
      man   doctor ŠEMU 3-COP-IPFV
      'The man is a real doctor.'

      Speaker's comment: "It means he's not a quack!"

(369) *lélim šému*
      lelim šemu
      night ŠEMU
      'middle of the night' or 'really dark'

(370) *dubáldiʔ šému héːš ʔíʔwi*
      dubaldiʔ šemu heːš ʔ-iʔiw-i
      five   ŠEMU Q   3-eat-IPFV
      'Did he eat exactly five (apples)?'

While it might be plausible to claim that a verb like *yaha* 'hurt' lexicalizes a scale of intensity that can be targeted in degree constructions (cf. English *My left hand hurts more than my right one*, *My left hand hurts a lot*), such an explanation cannot be extended to account for all of these examples. In a language like English that has a wider range of degree morphology at its disposal, such predicates typically resist combination with degree morphology, as shown in (371)-(373). This is taken to indicate that empirically these elements cannot be considered gradable along the lines of gradable adjectives.

(371)   a.   *The man is very/completely doctor.

        b.   *Joe is more doctor than Mary. (cf. Joe is more *of a* doctor than Mary.)

(372)   a.   *At midnight it's very/completely night.

        b.   *Midnight is more night than 2am.

(373)   a.   *This group is very/completely five.

        b.   *This group is more five than that group.

A more radical solution would be to say that in fact *šemu* is a degree modifier after all, and that contrary to the English facts in (371)-(373), the expressions that *šemu* modifies in (367)-(370) are gradable predicates in Washo, i.e., they are endowed with a degree argument. After all, I have proposed that the lexical semantics of predicates across language can vary on this very point: whether or not they have degree arguments. This would mean that my claim that gradable predicates in Washo lack degrees is incorrect, and furthermore, that Washo lexicalizes degree arguments in an even wider variety of predicates than just the 'canonical' gradable predicates. However, such a solution seems rather unmotivated, given that Washo lacks other degree constructions more generally. What I will propose in this section instead is that *šemu* is not a true degree modifier, and give it a more general semantics that accounts for its cross-categorial nature.

Before moving on to the analysis, I first point out another property of *šemu* that makes it different from more familiar degree modifiers. In addition to the wide distribution of *šemu*, we

also observe in these examples that the semantic effect of the modifier varies somewhat depending on the predicate modified. First, *šemu* intuitively has a standard-boosting intensification effect with minimum and relative standard predicates, as in (364), (366), and (367). Second, it seems to have a precisification effect, acting as a slack regulator (in the sense of Lasersohn, 1999) for predicates that readily allow imprecision in many contexts (365, 370). Third, as seen in (368)-(369), *šemu* seems to be used to identify a prototypical or special instance of a predicate. Such behavior is not typical of true degree modifiers, which have a uniform interpretation across uses. For instance, *very* has a consistent meaning of boosting the standard for evaluating the predicate it applies to, while *completely* has a consistent maximizing interpretation (i.e., identifying the maximum value on the relevant scale).

The wide distribution and somewhat variable semantic effects provide evidence for treating *šemu* as a modifier that does not operate over degrees, in contrast with true degree modifiers such as *very* and *completely*, which have very restricted distributions and consistent semantic effects across uses. To account for this behavior, I follow the analysis for *šemu* of Beltrama & Bochnak (To appear), building on the ideas of Bochnak (2012). The basic idea is that *šemu* operates over the contextual parameter settings that affect the interpretation of the predicates it modifies, and in particular universally quantifies over them. This general idea bears similarities to supervaluation-ist theories of comparatives (e.g. Klein 1980; and more recently Doetjes et al. 2009; van Rooij 2011). Under such analyses, comparatives existentially quantify over the contextually-provided comparison classes that are used in the interpretation of relative gradable predicates. Specifically, the sentence *John is taller than Bill* is true only if there is a context in which the domain can be partitioned in such a way that John counts as tall in that context and Bill does not (see discussion in chapter 2). The approach taken here is similar in that it involves quantification over contextual parameters such as comparison classes. However, the mechanism proposed here is somewhat more general in the sense that comparison classes are not the only contextual parameters that may be targeted *šemu*.

I implement the analysis in the following way: *šemu* applies to a context-sensitive predicate P_c, and universally quantifies over the contextual parameters that contribute to the interpretation of P_c. In the case of relative-standard gradable adjectives, the relevant contextual parameter is the relevant comparison class to derive the standard; in the case of absolute-standard and other precise predicates, the relevant parameter is the amount of "pragmatic slack" allowed by the context. I represent the context-sensitivity of the relevant predicates using the notation P_c, where c is a free variable whose value must be fixed contextually.

I follow Beltrama & Bochnak (To appear), where we represent this idea formally by introducing c as a parameter on the interpretation function. Assuming that the interpretation of linguistic expressions is also relativized to (at least) a world w and an assignment function g (Heim & Kratzer, 1998), the template for deriving the meanings of context-sensitive predicates can be modeled as in (374).

(374) $[\![P_c]\!]^{w,g,c} = \lambda x.P(x)$ in c

I propose that *šemu* universally quantify over possible values of c, and state that P_c must hold under all possible values of the contextual parameters. As such, an individual must count as instantiating P_c even under the most restrictive context, leading to the intensified interpretation. Specifically, P_c holds for all c' that bear a relation R to c. The relation R holds between c and c' if c' is just like c, except possibly for the values they assign to the relevant contextual parameter that affects the interpretation of P_c. The semantics of *šemu* is then modeled as in (375):[3]

(375) $[\![$ *šemu* $]\!]^{w,g,c} = \lambda P_c \lambda x. \forall c'[cRc' \rightarrow P(x)$ in $c']$

Under this analysis, an utterance of the proposition *šemu*$(P_c)(x)$ means that x falls under the extension of P_c under all assignments for c. This means that $P_c(x)$ must hold in even under the strictest contexts under consideration, leading to the intensification effect. I assume that R must be reflexive

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3. Going forward, I will suppress w and g as parameters of the interpretation function when reference to them is not relevant.

to ensure that $P_c(x)$ holds in the actual context as well (i.e., that *x is tall* is true in addition to *x is tall*-mod).

The proposed analysis involving universal quantification over contexts is quite similar in spirit to the analyses offered by Williamson (1999) and Barker (2002) for the English modifier *definitely*, and McNabb (2012a) for Hebrew *mamaš* 'really'. For Williamson, *definitely* applies to a proposition (set of worlds), and returns a proposition that is true in all worlds accessible from the actual world, according to some accessibility relation R. I do not borrow this implementation wholesale for our analysis for three reasons. First, the morphosyntactic facts do not appear to support an analysis of *šemu* as a propositional modifier. Rather, we would like to capture the fact that *šemu* modifies and affects the interpretation of predicates. Second, we would like to keep world variables separate from contextual variables in the semantics of these predicates. There is reason to believe that we need to distinguish between modal verbs and propositional attitude verbs which bind world variables, and the modifiers we discuss here which operate over contextual variables. While comparing the specific behaviors of world versus contextual variables will be left for future research, examples such as (376) provides some initial evidence that world and contextual variables should be kept separate where *šemu* occurs embedded under the verb *hamu-* 'think'.

(376)   a. Context: The tribal chief has taken a leave of absence and John has been named the acting chief. Tim comes to Dresslerville and meets John, and thinks he's the real chief.

      b. *Tim hádigi t'éːliwhu detúmu* **šému** *k'-áʔ-aʔ   hámu-yaʔ   ʔišŋa detúmu*
      Tim that   man   leader ŠEMU 3-COP-AOR 3.think-AOR but.SR leader
      šému-yéːs k'-éʔ-i
      ŠEMU-NEG 3-COP-IPFV
      'Tim thinks that man is the real chief, but he's not the real chief.'

Third, the definition of the accessibility relation R is left rather vague on Williamson's account. Depending on the choice of R, though, the interpretation of *definitely* could vary wildly. For instance, if R is a doxastic accessibility relation, the interpretation of *definitely* ends up essentially being equivalent to that of *believe*, which seems too weak.

Barker gets around this problem by dispensing with the accessibility relation. He uses quantification over candidate worlds within a dynamic framework. In his approach, *John is definitely tall* is true in a world $c \in C$ (a member of the context set C) if John counts as tall in c and there is no other $c' \in C$ in which John's height is the same but he does not count as tall c'. Similarly, McNabb (2012a) proposes that the Hebrew modifier *mamaš* 'really' applies to a property and states that the property holds of an individual in all relevant contexts of evaluation.[4] This is exactly the intuition we would like to capture for the semantic contribution of *šemu*. The approach, though, should be even more general than Barker's, since he only considers *definitely* in contexts where it modifies gradable adjectives in English, and consequently his analysis is degree-based. However, even Barker's analysis for English should be made more general, given that *definitely* regularly modifies other predicates as well (e.g. *It's definitely raining*, *He is definitely a doctor/a champion/Italian*), which makes *definitely* look a lot like *šemu* with respect to cross-categorial modification.

Before continuing, I want to briefly specify more about the sorts of things that our c affects in the interpretation of predicates, and those things that it does not. First, we want to keep c separate from the assignment function g, which assigns values to free variables such as pronouns. While I sometimes describe the contribution of c as assigning a value to a variable, the function of c is different from that of assignment functions as they are normally conceived. Rather, c affects the interpretation of predicates, which are constants in the model, as opposed to open variables such as pronouns. Likewise, the parameter c as conceived here does not affect the parameters related to context-sensitivity observed in indexical expressions, as in Schlenker (2003) and Anand & Nevins (2004). Thus, c is only intended to apply to contextual parameters such as comparison classes and amount of precision tolerated, and only affects the interpretation of predicates that are subject to context-sensitivity along those parameters.

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4. McNabb's notion of 'relevant' contexts is left somewhat vague. I try to avoid this issue by specifying in more detail the characteristics of a relation R between contexts (see below). However, some notion of domain restriction will still be necessary to rule out 'pathological' assignments.

As I now briefly show, this analysis is general enough to capture the wide distribution of *šemu*, as well as its apparently variable semantic contribution. First, considering the modification of *delkaykayiʔ* 'tall' by *šemu* as in (364), we can see how the intensification effects arise. By hypothesis, predicates like *delkaykayiʔ* are context-sensitive vague predicates, as modeled in (377).

(377) $[\![\ delkaykayi\textit{ʔ}\ ]\!]^c = \lambda x . x$ counts as tall in c

Here, c is a free variable that must receive its value from context, according to some comparison class available in the context. However, *šemu* requires that x count as tall under any value of the contextual parameter.[5] For example, if *delkaykayiʔ šemu* is true of Bill, then Bill must count as tall not only in a typical assignment of the contextual parameter (e.g. a comparison class of adult males), but under stricter assignments as well (e.g. a comparison class of professional basketball players). It can therefore be inferred that x must be well above the cut-off for counting as tall, since x must count as tall under even the strictest of assignments, i.e., in all contexts.

In the case of precise predicates, as observed by Lasersohn (1999) and Kennedy & McNally (2005), these are often subject to imprecise. That is, a glass may not be full to the brim to be considered full in most contexts. The level of imprecision tolerated, however, is context-dependent. Lasersohn terms this effect as 'pragmatic slack' and treats certain elements like *exactly* as pragmatic slack regulators. That is, there are certain linguistic expressions whose function is to affect the level of precision tolerated in a context. He models this formally in terms of pragmatic halos. The pragmatic halo of an expression is a set of objects of the same type as its denotation, which differ in ways that are 'pragmatically ignorable'. The size of the halo may vary from context to context, and depending on the pragmatic needs of the situation, we may be in a context where more or less precision is necessary. If we model this context-sensitivity in a similar way as we did for vague predicates (i.e., as a contextual variable that must receive its value from the assignment function), then effect of *šemu* on precise predicates is clear. The predicate must be true of an individual

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5. As indicated above, some sort of domain restriction on possible contextual values is necessary to prevent unwanted assignments, e.g., admitting comparison classes that the individual x could not conceivably be a part of.

x under any assignment of the contextual parameter, even the strictest ones where we are required to be as precise as possible. This means that even the highest standard of precision must be met, leading to the precisification effect of *šemu* with precise predicates.[6] For this analysis of these predicates to go through, we must say that the interpretation of predicates subject to imprecision are context-sensitive, rather than having strict truth conditions that can pragmatically be subject to imprecision along the lines of Lasersohn (1999) or Kennedy & McNally (2005). I suggest that this can be achieved by hard-wiring in the semantics of pragmatic halos directly into the semantics of these predicates, though I do not formalize this here.

Finally, this analysis captures the cases where *šemu* is used to make reference to a prototype or special instance of a noun. The analysis here is essentially only a slight variant of the halo-based analysis above. I will illustrate using the example where *šemu* modifies *dokto* 'doctor' as in (368). What counts as a member of the set of doctors can vary across contexts (e.g. PhDs may be considered doctors in some contexts but not in others). I therefore assume that the interpretation of these expressions are also subject to a contextual parameter that is fixed by the assignment function. That is, the use of *šemu* means that an individual must count as a doctor under any assignment of this parameter. If this is the case, then the individual must be a good exemplar of a doctor, since it counts as a doctor in any context. Thus, the prototypicality effects can also be derived under this analysis of *šemu*. Again, for this analysis to work, nouns like *dokto* must be analyzed as being context-sensitive in the same way as precise gradable predicates as indicated above. Likewise, numerals in Washo must be considered context-sensitive in order to account for cases like (370).

To sum up, the wide distribution and variable semantic effect of *šemu* provide evidence that it does not target degrees, in contrast with true degree modifiers like those found in English. This behavior of modifiers is entirely expected in a language where the distinction between true degree

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6. An alternative formalization of imprecision is offered by Morzycki (2011). His analysis also contains a free variable that regulates the contextual level of precision. Thus, the proposal here can equally be couched within Morzycki's framework by allowing the assignment function to operate over this contextual parameter.

predicates and non-degree predicates is neutralized. To the extent that modifiers in degree-less languages do show distributional sensitivities, the distinctions at work that contribute to those sensitivities will not be based on scale structure, or on whether a predicate lexicalizes a degree argument or not.

6.3.2   *Capturing scale structure effects*

I have argued here that the modifier *šemu* is not a true degree modifier, and in particular it does not track scale structural differences between gradable predicates. One of the merits of the degree analysis of gradable predicates is that it can easily capture the behavior of relative versus absolute (maximum and minimum standard) predicates by analyzing scale structure as consisting, in part, of a set of degrees (Kennedy & McNally, 2005; Kennedy, 2007c). The distribution of degree modifiers can then be accounted for by making reference to scale structure. For example, *completely* only modifies those adjectives whose scale consists of a set of degrees that includes a maximum value, ruling out **completely tall*, while ruling in *completely full*.

Under a vague predicate analysis like Kamp (1975) or Klein (1980), such facts are much more difficult to account for. To be fair, these authors did not have the relative/absolute distinction in mind, and assumed that all gradable adjectives are vague. In any case, it seems a desirable conclusion of the vague predicate analysis for Washo proposed in this chapter that there should be no scale structure effects with respect to modifier selection.

However, in the previous chapter, we did in fact observe apparent scale structure effects with conjoined comparisons. Recall that one of the tests for explicit versus implicit comparison involved whether comparisons formed with absolute-standard predicates are felicitous. It was shown that conjoined comparisons in Washo with absolute-standard predicates are indeed infelicitous. An example with the minimum-standard predicate *ʔilk'únk'uniʔ* 'bent', and maximum-standard predicate *ʔilší:šibiʔ* 'straight' is repeated here in (378):

(378)   a. Context: comparing two bent rods, one more bent than the other (though not a crisp

judgment context)

b. # *wíːdiʔ ʔilkʼúnkʼuniʔaš*   *wíːdiʔ ʔilšíːšibiʔi*
    wiːdiʔ ʔil-kʼunkʼun-iʔ-aʔ-š   wiːdiʔ ʔil-šiːšib-iʔ-i
    this   ATTR-bent-ATTR-AOR-SR this   ATTR-straight-ATTR-IPFV
    Intended: 'This one is more bent than that one.'

    (lit: 'This one is bent, that one is straight.')

Therefore we do observe some apparent scale structure effects here, which results in the infelicitous (378). What we need then is to find a way to account for such effects without resorting to degrees in order to maintain the vague predicate analysis proposed in this chapter.

An obvious solution would be to claim that the difference between relative and absolute-standard predicates in Washo derives from the fact that only the former are vague and have interpretations that are dependent on comparison classes. Indeed, absolute-standard predicates do not support sorites inferences, and are not subject to the similarity constraint for their interpretation (Kennedy, 2007c, 2011). However, recent literature has questioned the apparent lack of comparison class-based vagueness in even absolute predicates. First, McNabb (2012b) shows through experimental evidence that the interpretation of minimum-standard predicates, particularly in combination with degree modifiers, does still make reference to comparison classes. Whereas the experimental results showed no effect of comparison class on the interpretation of unmodified minimum-standard predicates, there was a significant effect of comparison class for the interpretation of minimum-standard predicates modified by *very*. Second, Burnett (2011) that absolute gradable predicates can still be considered vague in that they still give rise to borderline cases. She bases her claims on examples like (379), where overt contradictions are possible with absolute-standard predicates, just like they are with relative-standard predicates:

(379)   a. Mary is both small and not small. (hard to tell whether she counts as small or not; a borderline case)

      b. These pants about both dirty and not dirty. (They have some dirt on them, but I don't need to wash them yet.)   (Burnett, 2011)

In sum, the claim that absolute-standard predicates are simply not vague and not related to comparison classes has been subject to recent scrutiny, and attempting to derive apparent scale structure effects from such a claim is problematic.

A second option for modeling the relative-absolute distinction in the absence of degrees comes from a proposal by McNally (2011) that the distinction tracks two different classification strategies associated with these predicates. She proposes that relative predicates are based on classification by similarity, whereas absolute predicates are based on classification by rule. She borrows these terms from Hahn & Chater (1998), who claim that similarity-based versus rule-based reasoning are two distinct cognitive strategies for categorization and classification. In short, similarity-based classification involves comparing an individual and how it instantiates a property with other individuals and how they instantiate that property. For an object to count as *tall*, it needs to be compared to other individuals, and be close enough to exemplars that also count as *tall* in a context. Crucially, this process only requires a partial match between representations, which accounts for why we observe sorites effects and the similarity constraint with relative-standard predicates. By contrast, rule-based classification involves comparing an individual to an abstract representation of what counts as instantiating the relevant property. For example, to decide whether an object counts as *full*, we only need to know how much of its volume is occupied, and whether that amount is total or not. In contrast with similarity-based classification, rule-based classification requires a strict matching between representations, which accounts for the absolute interpretations of such predicates, and why they do not give rise to the sorites paradox.

Under this account, the relative-absolute distinction is derived by an independently-motivated underlying cognitive classification system, without any reference to degrees. A language may choose to hardwire this information into the semantics of gradable predicates through scale structure, at which point the distinction can have greater linguistic significance, e.g., it can be tracked by modifier selection. Importantly, this account allows us to maintain a degree-less analysis of gradable predicates in Washo, while at the same time accounting for the distinctions between relative

and absolute predicates that were observed in conjoined comparisons.

6.4   No equatives or superlatives

Just as explicit comparative morphemes do not exist in Washo, we also expect not to find equative or superlative morphemes if gradable predicates in this language do not introduce degree variables. Typological work has shown there is a one-way implication such that there appear to be no languages that we know of that have dedicated equative or superlative morphemes, but lack a comparative morpheme (Bobaljik, 2012; Stassen, 1985). By contrast, there are many languages that do have explicit comparative constructions but nevertheless lack equative and superlative morphemes. If we discovered that Washo had an equative or superlative morpheme, this would raise red flags about the claim that gradable predicates do not have degree arguments, and especially the claim that this language lacks a comparative morpheme.

Fortunately, the prediction that Washo does not have true equatives or superlatives appears to be correct. The sentence in (380) is an example of a translation offered for an English equative construction.

(380)   *t'éːliwhuhak'a šáwlamhu t'éːk'eʔ wewgíʔišiʔi*
        t'eːliwhu-hak'a šawlamhu t'eːk'eʔ w-wgiʔiš-iʔ-i
        man-with   girl   much   STATIC-measure-ATTR-IPFV
        'The man and the girl are heavy.' / 'The man and the girl measure a lot.'

        Prompt: 'The man is as heavy as the girl.'

We note that there is no special equative morphology in (380); it is simply a statement that the same property holds of two individuals, and the comitative suffix *-hak'a* is used on one of the NPs. This morphology is often translated as 'with' as in (381), but is also more generally for NP coordination, as in (382).

(381)   *méːhu šáwlamhuhak'a wagayáyʔi*
        meːhu šawlamhu-hak'a wagayayʔ-i
        boy   girl-with   talk-IPFV

'The boy is talking with the girl.'

(382) *ʔuŋábihak'a demubá:bɨl*
ʔuŋabi-hak'a demuba:bɨl
salt-with   pepper
'salt and pepper'

In addition to the fact that there is no dedicated equative morphology present on the surface, such sentences also do not require that the two individuals hold the relevant property to the same degree. A case in point is (383), where the two individuals being compared with respect to age are 10 years apart.

(383)   a. Context: talking about a man who is 85 years old and a woman who is 75 years old, i.e., both share the property of being old

   b. *t'é:liwhuhak'a da͡ʔmó͡ʔmoʔ t'é:k'eʔ dewgális   k'é͡ʔi*
      t'e:liwhu-hak'a da͡ʔmo͡ʔmoʔ t'e:k'eʔ de-w-galis   k'-e͡ʔ-i
      man-with   woman   many   NMLZ-STATIC-winter 3-COP-IPFV
      'The man and the woman are old.'

We thus have evidence that no true equative morpheme is present in (380) and (383). I conclude that there is no equative morphology in the language, consistent with the hypothesis that gradable predicates in Washo do not introduce degree arguments, and lacks functional degree morphology.

Similarly, we expect to find no superlative morpheme. Preliminary evidence suggests that this is also the case. The sentence in (384) is a conjoined structure, where the subject of the second clause is *mi͡ʔlew* 'everyone', while (385) shows that locative comparison constructions can also be used with the standard of comparison *mi͡ʔleʔ* 'everything' to achieve a superlative interpretation.

(384) *diŋám   ʔilkáykayi͡ʔi   mí͡ʔlew   ʔilkáykayi͡ʔé:si*
      di-ŋam   ʔil-kaykay-i͡ʔ-i   mi͡ʔle͡ʔ-w   ʔil-kaykay-i͡ʔ-e:s-i
      1.POSS-son ATTR-tall-ATTR-IPFV everything-HUM.PL ATTR-tall-ATTR-NEG-IPFV
      'My son is tall, everyone is not tall.'

      Prompt: 'My son is the tallest (in his class).'

(385) *t'éːliwhu t'éːk'eʔ dewgíʔiš k'éʔi   míʔleʔa*
      t'eːliwhu t'eːk'eʔ dewgiʔiš k'-eʔ-i   miʔleʔ-a
      man   much   height   3-COP-IPFV everything-LOC
      'The man is tall next to everything.'

      Prompt: 'The man is the tallest.'

No dedicated superlative morphology is used, as expected in the degree-less analysis. This strategy of achieving a superlative interpretation by using a lexical item meaning 'everything' or 'all' as the standard of comparison is quite common for languages that lack a dedicated superlative construction (Bobaljik, 2012). The Washo sentence in (384) is just like any other conjoined comparison structure. Likewise, with other locative comparisons, an utterance of the sentence in (385) can give rise to an implicature that a comparison is to be drawn between the subject and the referent of the NP marked by the locative morpheme. In this case, the man is being compared to 'everything' (in the relevant context), so if the invited implicature is drawn, (385) can be used to indicate that the man is the tallest in that context without making use of a dedicated superlative morpheme that operates over degrees.

To summarize, Washo lacks dedicated equative and superlative constructions. While this state of affairs is common in the world's languages, even among those that have explicit comparatives, this fact is unsurprising in Washo given that it lacks a comparative morpheme, and is furthermore consistent with the hypothesis that gradable predicates in this language do not introduce degree variables.

6.5   The behavior of 'degree' achievements

Taking stock so far, I have argued that Washo lacks a comparative morpheme, which led to the hypothesis that gradable predicates in this language do not lexicalize a degree argument. This hypothesis in turn led to the prediction that the language lacks all other functional degree morphology, and the present chapter has shown this prediction is indeed borne out. I now briefly discuss another phenomenon that has been linked to degree semantics, and specifically the semantics of gradable

adjectives, namely aspectual composition, especially of so-called degree achievement verbs Dowty (1979), which are derived from gradable adjectives.

Based on the success of degree analyses of comparison and gradability in languages like English, many semanticists have recently begun to adopt degree analyses of other phenomena as well. One line of research where degree arguments have come to play an important role is in aspectual composition, particularly in analyses of variable telicity of degree achievements and incremental theme predicates (Hay et al., 1999; Piñón, 2005, 2008; Kennedy & Levin, 2008; Stensrud, 2009, among others). In particular, Kennedy & Levin (2008) have shown that degree achievement verbs in English show strikingly similar properties to gradability in the adjectival domain, and offer a degree analysis of these verbs that make use of measure of change functions derived from the measure functions encoded in gradable adjectives. A degree achievement like *widen* in (386) encodes a measure of change function that takes an individual x and an event e as arguments, and returns the degree to which x changes along the dimension of width as a result of participating in e (where *init* and *fin* are functions that return the initial and final temporal intervals of an event).

(386) $[\![\, widen \,]\!] = \lambda x \lambda e.\mathbf{wide}^{\uparrow}_{\mathbf{wide}(x)(init(e))}(x)(fin(e))$

This measure of change function combines with a version of the POS morpheme for verbs and returns a predicate of individuals and events which is true if the degree to which x changes with respect to width is above a contextual standard. Kennedy & Levin argue that measure of change functions always encode at least a minimum standard, which means that degree achievements in English can always have a 'comparative' interpretation. That is, a sentence like *The gap widened* is atelic (i.e., does not entail a particular end state has been reached), and furthermore does not entail *The gap became wide*, but rather only entails that the gap underwent a non-zero increase in width. The analysis also predicts that degree achievements like *straighten*, which are based on maximum-standard predicates, have a default telic reading where the affected object reaches the maximum degree of straightness (i.e., the absolute interpretation of *straight* holds), but also an atelic reading which entails only a non-zero increase in straightness.

Kennedy & Levin claim that this account is superior to non-degree accounts like Dowty (1979) and Abusch (1986), where degree achievements are built from a vague predicate *P* that combines with the BECOME operator, as in (387):[7]

(387)   BECOME$(P)(x)(e) = 1$ iff $P(x)(init(e)) = 0$ & $P(x)(fin(e)) = 1$

Under this account, the (a)telicity effects derive from whether the contextual parameter of the vague predicate is fixed by the context of utterance (yielding a telic interpretation) or bound by an existential quantifier (yielding an atelic interpretation). Kennedy & Levin argue that such an account does not rule out telic interpretations for verbs like *widen*, and that this account cannot handle cases where degree achievements combine with measure phrases (e.g. *The gap widened (by) two inches*).

If the hypothesis that scalar predicates in Washo are vague predicates rather than gradable predicates that lexicalize measure functions, then we would expect degree achievement verbs in Washo to behave along the lines of the degree-less Dowty/Abusch analysis rather than the degree-based analysis of Kennedy & Levin. Preliminary evidence suggests that this is indeed the case. Translations of degree achievements into Washo typically result in a sentence like (388), where a scalar predicate is marked by the suffix *-etiʔ*, which is glossed as 'inchoative' by Jacobsen (1964):

(388)   *góːbeʔ métuʔetiʔi*
         goːbeʔ metuʔ-etiʔ-i
         coffee cold-INCH-IPFV
         Prompt: 'The coffee cooled.'

Since I claim that scalar predicates in Washo are vague predicates, such cases could readily be analyzed under the Dowty/Abusch account by analyzing the suffix *-etiʔ* as a lexicalization of the BECOME operator. If this is correct, then we would predict that sentences with such verbs should always entail the positive form. This prediction appears to be correct, as shown in (389):

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7. This summary of the Dowty/Abusch analysis is highly over-simplified; see Kennedy & Levin (2008) for a more detailed exposition and critique of this style of analysis for degree achievements in English.

(389) a. Context: describing a situation where a bent nail becomes straighter, but is not completely straight at the end of the event

b. # *ʔilšíːšibiʔetiʔi*
ʔil-šiːšib-iʔ-etiʔ-i
ATTR-straight-ATTR-INCH-IPFV
Intended: 'It straightened.'

Additionally, such an analysis would predict that sentences with such verbs should make reference to telic eventualities only, since the BECOME operator requires that an end state be reached. Once again, this prediction appears to be upheld. A test for telicity in Washo is the (un)acceptability with the adverb *haliŋa* 'for a long time', which is only compatible with atelic eventualities. This adverb is acceptable with activity verbs, as shown in (390), but incompatible with accomplishments, as shown in (391).

(390) *halíŋa   léːši diwgayáyʔi*
halíŋa   leː-ši di-wagayayʔ-i
long.time 1-DU   1-talk-IPFV
'We were talking for a long time.'

(391) # *dáŋal   halíŋa   dóːdamámaʔi*
d-aŋal   halíŋa   doːda-mamaʔ-i
D.POSS-house long.time build-finish-IPFV
Intended: 'It took a long time to finish building the house.'

As shown in (392), verbs with the suffix *-etiʔ* are incompatible with this adverb, indicating that they make reference to telic eventualities only.

(392) a. Context: The coffee has been sitting on the counter cooling down for a long time.

b. # *góːbeʔ halíŋa   métuʔetiʔi*
goːbeʔ haliŋa   metuʔ-etiʔ-i
coffee long.time cold-INCH-IPFV
Intended: 'The coffee cooled for a long time.'

A full account of these verbs in Washo requires more research on temporal reference and the aspectual properties of verbs in this language, especially with respect to telicity, which is left for

future work. But based on cases like (389) and (392), we have preliminary evidence that 'degree' achievements in Washo are derived from a vague predicate plus the BECOME operator, wearing the degree-less Dowty/Abusch analysis on its sleeve.[8]

6.6 Two alternative hypotheses

Before concluding this chapter, I consider two possible alternative hypotheses to account for the Washo data, and the cross-linguistic variation observed. I argue that both alternatives lead to undesirable consequences, and that the right way to account for the Washo facts is to posit variation in the semantic type of scalar predicates across languages.

6.6.1 Hypothesis 1: Washo makes reference to degrees

The first alternative hypothesis would be to say that Washo lexicalizes a degree argument in scalar predicates after all, and simply lacks most of the corresponding functional morphology found in English. Specifically, we could claim that scalar predicates in Washo are type $\langle d, \langle e, t \rangle \rangle$, but that the only functional morphology available to Washo is the POS morpheme, realized as the 'attributive' morphology *ʔil-...-iʔ* that flanks many gradable predicates, and which I so far have ignored, and implicitly assumed to be semantically vacuous. Like POS, the function of the attributive morphology would be to close off the open degree argument position, and contribute the norm-related interpretation of the positive form. The composition of the scalar predicate *ʔil-kaykay-iʔ* 'tall' would be derived as in (395) by combining *-kaykay-*, a scalar predicate lexicalizing a degree argument as in (393), with the attributive morphology contributing the semantics of POS, as in (394):

(393) $[\![$ *-kaykay-* $]\!] = \lambda d \lambda x.\mathbf{height}(x) \succeq d$

(394) $[\![$ *ʔil-...-iʔ* $]\!] = \lambda G \lambda x.\exists d[d \succ s_G \wedge G(d)(x)]$

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8. Of course, Kennedy & Levin's criticism that the Dowty/Abusch analysis can't handle measure phrases is not an issue in this case since Washo lacks measure phrases.

(395) $[\![\ ?il\text{-}kaykay\text{-}i? \ ]\!] = \lambda x.\exists d[d \succ s_{tall} \land \textbf{height}(x) \succeq d]$

Such a hypothesis is attractive since we would be able to maintain a universal semantic type for gradable predicates across languages, and posit variation instead in the inventory of functional degree morphemes. In other semantic domains such as tense or evidentiality, we observe variation in the number of functional elements a given language lexicalizes, so it seems natural that languages would vary along this dimension in the domain of degree semantics as well. And indeed, languages do vary in the number of functional degree morphemes at their disposal, with many lacking measure phrases, and/or superlative and equative morphology.

Under this proposal, Washo would be a remarkable language from the point of view of degree semantics for at least two reasons. First, it would provide us with an example of a language that has a single-membered set of degree morphemes at its disposal, in contrast to languages like English that have many more. Second, Washo would be a language that has an overt reflex of the POS morpheme, addressing a long-standing worry of the opponents of the degree analysis that the overt manifestation of this morpheme is absent cross-linguistically. I maintain, however, that this alternative analysis of Washo is both conceptually and empirically undesirable.

From a conceptual point of view, this analysis of Washo is undesirable, since the only degree morpheme in the language would be one that is only hypothesized for languages like English as a technical fix to bind the degree argument in the absence of some other degree morpheme. Appealing to null morphology to complete a morphological paradigm does not have to be conceptually costly. However, Washo lacks all other morphology that makes up the relevant paradigm in English. Therefore, proposing a decompositional semantics for gradable predicates in Washo along the lines of English leaves us with an analysis that misses the most interesting point of the Washo data, namely that this language lacks *all* the overt degree morphemes of the corresponding English paradigm.[9] Furthermore, the evidence used by von Stechow (1984) and Kennedy (2011) to argue

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9. A similar argument is made by Tonhauser (2011) against a null tense analysis for Paraguayan Guaraní, where she argues that an appeal to a null tense is undesirable given that there are no overt tenses in the language.

for the decompositional analysis (and specifically degree-based analysis in the case of von Ste-chow) for English does not even arise in Washo. Recall from chapter 2 that they used arguments based on differential measure phrases and crisp judgement context to argue for a decompositional degree-based analysis of gradable predicates in languages like English. Washo, however, lacks measure phrases altogether, and does not show crisp judgement effects in comparative sentences, so von Stechow and Kennedy's arguments against the vague predicate analysis for English do not carry over to Washo. I maintain that the most parsimonious analysis for Washo treats scalar predi-cates as degree-less vague predicates without introducing the "unjustified complexity" of degrees.

There are also empirical reasons for rejecting this sort of analysis for Washo. First, there are many verbal stems that do not compose with the attributive morphology, and nevertheless receive a norm-related interpretation, for instance *miːpʼil* 'full', *yakʼaš* 'warm', *mucʼucʼu* 'sweet', among many others. Rather, these verb stems compose directly with verbal morphology without first combining with the attributive affixes. The set of gradable predicates that do not require attribu-tive morphology appears to be random, and not determined by some semantic parameter, e.g., relative versus absolute standard predicates, or dimensional versus non-dimensional predicates. Thus, under this account, it would simply have to be stipulated that some gradable predicates do not combine with POS, or combine with a null version of POS that contributes the norm-related semantics.

Even if we accept this stipulation, there is evidence that even the gradable predicates that do combine with attributive morphology lexicalize a norm-related interpretation in environments where the attributive morphology is not present. An environment where the attributive morphology does not occur with scalar roots is in bipartite verb stem constructions, which are formed by the concatenation of two bound morphemes to form a complex verbal stem (Jacobsen 1980; Bochnak & Rhomieux 2013). Scalar roots can appear as the second element of a bipartite stem, as in (396). In its predicative use, such a scalar root appears in a partially reduplicated form, flanked by the attributive morphemes in a manner which should by now be familiar, as in (397).

(396) *tugílp'ili*
       tug-ilp'il-i
       eye-blue-IPFV
       'He has blue eyes.' / 'He is blue-eyed.'   (Jacobsen, 1964, p. 109)

(397) *ʔilp'ílp'iliʔi*
       ʔil-p'ilp'il-iʔ-i
       ATTR-blue-ATTR-IPFV
       'It is blue.'

The semantics of the individual roots that make up bipartite stems can be difficult to test, since many bipartite stems have somewhat idiomatic meanings that are not fully compositional. However, an example relevant for our purposes comes from the bipartite verb form in (398), where the bipartite verb means 'to iron', and includes the root *-išib-* 'straight' (compare with (399), where this root appears with attributive morphology).

(398) *didéːšibi*
       di-de-išib-i
       1-with.instrument-straight-IPFV
       'I'm ironing it.'

(399) *ʔilšíšibiʔi*
       ʔil-šiːšib-iʔ-i
       ATTR-straight-ATTR-IPFV
       'It is straight.'

Evidence that the verb in (398) contains the norm-related interpretation of the root *-išib-* 'straight' comes from the unacceptability of cases like (400). If the root *-išib-* has a norm-related semantics, then a denial that the scalar predicate holds should lead to a contradiction. Speakers do in fact judge such cases unacceptable, which is shown in (400).[10]

(400) a. Context: I was ironing my clothes, but I couldn't get all the wrinkles out. The clothes just aren't getting straight.

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10. Recall from section 6.5 that clauses containing a verb with the inchoative suffix *-etiʔ* entail that the positive form of the gradable predicate from which the inchoative verb is derived holds.

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b. # *ʔitwáʔ didéːšibi*   *ʔišŋa*
    ʔitwaʔ di-de-išib-i   ʔišŋa
    clothes 1-with.instrument-straight-IPFV but
    ʔilšíːšibiʔetiʔéːsi
    ʔil-šiːšib-iʔ-etiʔ-eːs-i
    ATTR-straight-ATTR-INCH-NEG-IPFV

    Intended: 'I ironed the clothes, but they're not straight.'

Thus, there is at least some evidence that the norm-relatedness is encoded directly in the roots of gradable predicates, and is not a contribution of the attributive morphology. I therefore suggest that the attributive morphology is semantically vacuous, and appears with scalar roots that for morpho-syntactic reasons cannot function as verbal stems on their own. Such scalar roots must combine with some other morphology, either an initial element of a bipartite stem or the attributive morphology, to appear in a verbal construction. In either case, the scalar root lexically encodes the norm-related semantics.

An alternative proposal for the contribution of the attributive morphology could be couched within the analysis of Koontz-Garboden & Francez (2010) for possessed properties in Ulwa. They propose that scalar predicates are lexicalized as 'primitive properties' of logical type p, a sub-type of individuals. Under their system, the lexical entry of *-kaykay-* 'tall' would be rendered as in (401), where capital letters represent a primitive property. Such an element must undergo a type shift to be used as a predicate. For Koontz-Garboden & Francez, possessive morphology in Ulwa performs this function, relating the primitive property to an individual via the possessive relation π. Applying this analysis to Washo, the attributive morphology would have the interpretation in (402).[11]

(401)   ⟦ *-kaykay-* ⟧ = TALL

(402)   ⟦ *ʔil-...-iʔ* ⟧ = $\lambda \Pi_p \lambda x[\pi(x, \Pi)]$

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11. Francez & Koontz-Garboden (2012) implement a somewhat different analysis of property-denoting roots and the way in which they combine with possessive morphology in Ulwa to derive gradable predicate meanings. The difficulties of applying such an analysis to Washo remain the same.

While this account has the appeal of being able to assign an interpretation to the morphology that I have claimed is vacuous, Koontz-Garboden & Francez's analysis cannot be adopted to Washo. First, this analysis for Ulwa accounts for why possessive morphology appears both on scalar property terms and on other nominal elements. In Washo, however, there does not seem to be any connection between attributive and possessive morphology, so a semantics of possession for the attributive morphology in Washo seems less natural than the corresponding case in Ulwa. Second, Koontz-Garboden & Francez argue that scalar roots that combine with possessive morphology are essentially nominal in nature. While it is difficult to test the category-hood of these roots in Washo since they never appear in isolation, the fact that they can appear as the second element in bipartite verb stem constructions means that if anything, they are more verb-like in nature.[12]

Before concluding this section, I briefly outline one more hypothesis regarding how degrees might be incorporated in gradable predicates in Washo after all. Sassoon (2010, 2013) argues that there are different sorts of degrees that languages make use of, based on insights from measurement theory.[13] The sort of degrees that English makes use of in degree constructions are of a type that support difference comparisons (*two meters taller than*) and ratio comparisons (*twice as tall as*). Meanwhile, English also makes use of so-called ordinal degrees that are simply used for classification purposes, and measuring notions like prototypicality. Degrees of this type, she argues, are implicated in nominal predicates, and are responsible for our knowledge that robins are more prototypical instances of birds than ostriches are. Under this view, we could analyze Washo as making use of degrees in gradable predicates, but only the more impoverished ordinal degrees, rather than English-like degrees that support difference and ratio judgments. However, it is unclear how positing different sub-types of degrees is any different from the hypothesis that gradable predicates in Washo just don't introduce degree arguments at all. The different ontological properties

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12. Nominal-like elements may appear as the first element of a bipartite stem in Washo (Jacobsen 1980; Bochnak & Rhomieux 2013).

13. Sassoon cites Stevens (1946) and Krantz et al. (1971) as the background sources on measurement theory.

of these sub-types of degrees still predicts that if Washo makes use of ordinal degrees only, then it should not have any of the other degree morphology, since ordinal degrees cannot be manipulated by true 'degree' morphology. I therefore conclude that the measurement theory-based account of ordinal degrees essentially reduces to the claim that degrees (as they are traditionally conceived in the literature) are in fact absent in Washo.

In sum, we must reject the hypothesis that gradable predicates in Washo encode a degree argument position, and more generally that a decompositional analysis is possible, both on conceptual and empirical grounds.

6.6.2   Hypothesis 2: scalar predicates in English are vague predicates

There is a second alternative hypothesis to the one argued for here that would maintain a uniform semantic type for scalar predicates cross-linguistically. Specifically, scalar predicates are universally vague predicates, and Washo and English vary in the inventory of 'degree' morphology that can combine with these predicates. That is, in all languages gradable predicates are lexicalized as $\langle e,t \rangle$ predicates, but languages like English have a mechanism at their disposal to allow gradable predicates to combine with degree morphology. Once again, such an analysis has the appeal that we can maintain a uniform semantic type for scalar predicates across languages, and relegate cross-linguistic variation to the inventory of functional morphemes.

However, this type of analysis also runs into problems. First, it was observed in chapter 2 that the vague predicate analysis confronts problems for English with respect to accounting for differential measure phrases and crisp judgment effects, leading to the conclusion that a degree analysis, or at the very least a decompositional analysis, is necessary to account for the English data. Second, under the Kamp-Klein vague predicate analysis, 'degree' morphemes like the comparative and modifiers like *very* are characterized as operations on contextual parameters and comparison classes.[14] If such an analysis for English is correct, then variation with respect to whether or not

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14. See Doetjes et al. (2009), van Rooij (2011), and Burnett (To appear) for recent implementations of this idea.

gradable predicates introduce degree variables is not an issue.

We are then left with the question of how to explain the variation observed between English and Washo, which I have attributed to a difference in semantic types. Proponents of this analysis would then have to say that Washo lacks certain operations over contextual parameters, and does not lexicalize any morphemes that correspond to these operations. This analysis seems unlikely to turn out correct for Washo. First, it seems highly unlikely that we would find cross-linguistic variation in contextual parameter settings of this sort. Gradable predicates in Washo still rely on comparison classes for their interpretation. It is simply not the case that in evaluating whether an adult male counts as *ʔilkáykayiʔ* 'tall' that speakers consider his height against trees, mountains, or other objects that have a much greater absolute height. Similarly, implicit contextual domain restriction of quantifiers in Washo appears to behave exactly like it does in English. For instance, the universal quantifier in (403) is interpreted as quantifying over party guests, and not over all humans.

(403)   a. Context: You are telling me about a party you attended last night, and what food was served and eaten.

   b. *míʔlewšek*   *zí:gin*   *ʔíʔwayʔgi*
      miʔleʔ-w-šeg   zi:gin   ʔ-iʔiw-ayʔ-i
      every-HUMAN.PL-almost chicken 3-eat-INT.PST-IPFV
      'Almost everyone ate chicken.'

Second, I have proposed in section 6.3 that the modifier *šemu* in fact *does* have a meaning that manipulates contextual parameters along the lines proposed by Klein (1980) and others for degree morphology in English. The main difference between the sort of analysis I give for *šemu* and a Klein-style analysis for degree morphology lies in the fact that *šemu* applies to a larger set of predicates.

Third, this analysis does not provide a good explanation for why Washo doesn't have *any* English-like degree morphemes at all. While we might still expect a certain amount of cross-linguistic variation in the inventory of functional degree morphology under such an account, the

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complete lack of degree morphemes would simply be accidental, which does not seem like a satisfying account of the facts.

Thus, this second alternative hypothesis should also not be adopted, as it has difficulty accounting for the cross-linguistic facts discussed in this chapter and the previous one. This means that the best way to capture the cross-linguistic facts is to propose variation in the type of gradable predicates across languages: those in English(-like languages) introduce degree variables; those in Washo(-like languages) do not. In fact, I argue that the Washo data discussed here in fact provide an indirect argument in favor of the degree analysis for English-like languages. Specifically, there are empirical differences between languages that use only contextual restriction for the interpretation of gradable predicates and comparisons, and languages that use degree variables. Washo instantiates the former type, whereby the interpretation of comparisons and intensification are essentially pragmatic. Adding degrees into the mix like in English essentially grammaticalizes these operations, and allows for the manipulation of degree variables directly in the semantics, with degree morphemes lexically encoding such operations.

A version of this hypothesis that circumvents many of the criticisms presented here would be to say that gradable predicates in English and Washo are vague predicates, but English makes use of a functional 'degree applicative' morpheme that transforms vague predicates into a degree relation, which can then be targeted by degree morphemes in the familiar way. This might be implemented along the lines of (404), where **m** is a function that applies to a predicate and an individual and returns a degree to which that individual holds the predicate (compare Kennedy, 2007b).

(404) $[\![\text{DEG}]\!] = \lambda P_{\langle e,t \rangle} \lambda d \lambda x. \mathbf{m}(P)(x) \succeq d$

Such an analysis circumvents many of the criticisms against the vague predicate approach to English outlined above and in chapter 2. It furthermore eliminates the need to posit a null POS morpheme, since the positive form of gradable predicates is an $\langle e,t \rangle$ predicate, and recourse to null functional morphology is only posited where we have overt degree morphology (e.g. the comparative morpheme, degree adverbs, measure phrases). The challenge, of course, becomes

the characterization of **m** and constraining the sorts of predicates that DEG in (404) applies to. In particular, DEG must only apply to a subset of $\langle e,t \rangle$ predicates, namely those that are grammatically gradable in English. Thus, is seems the distribution of DEG must track a semantic distinction between those predicates that are gradable, like *tall*, and those that are not, like *dead* or *tree*. But positing such a difference in the semantics of predicates in English is essentially tantamount to the analysis I propose in this chapter, namely that there are lexical semantic differences between scalar predicates in English and Washo that allow them to combine with degree morphology in the former but not in the latter.

A proponent of (404) could argue that no such lexical distinction is necessary in the two languages, and that Washo simply lacks DEG, while it freely applies in English. After all, many putatively non-gradable predicates can be coerced into appearing in comparatives, for example (cf. *?I feel more dead today than yesterday because of the looming dissertation deadline*). The reason why certain predicates like *tall* more easily accept degree morphology would be that the inherent vagueness and ordering relation associated with this predicate makes it relatively easy to find a function **m** to track this ordering. For apparently non-gradable predicates, it is more difficult to find a suitable **m**, but not impossible, as coercion shows. What exactly those relevant features for determining a suitable **m** might be is a difficult question, though recent work by Sassoon (2013) and Burnett (To appear) may be a step in this direction.

To summarize, I maintain that the best way to account for the variation observed between English and Washo lies in the lexical semantics of gradable predicates in the two languages. Those in English introduce degree variables, and those in Washo do not. Alternative hypotheses that seek a unified lexical semantics for gradable predicates across languages run into both conceptual and empirical problems and cannot be maintained.

6.7   Conclusion

In this chapter, I have argued that gradable predicates in Washo do not lexicalize a degree argument, in contrast with the standard analysis for English. This difference in semantic type between gradable predicates in Washo and English made the prediction that Washo lacks any functional morphology targeting degree variables, and this prediction was shown to be correct. Washo lacks not only a comparative morpheme, as shown in the previous chapter, but also the entire gamut of functional degree morphemes such as measure phrases, degree adverbs, and equative and superlatives. The cross-linguistic variation observed in this domain was therefore attributed not to accidental gaps in the functional morphology of Washo, but rather to the systematic absence of degree variables in gradable predicates in this language. I argued that this hypothesis is superior to those that try to maintain uniformity in the semantics of gradable predicates across languages, either by mapping Washo onto the standard English-style analysis, or by mapping English onto a Washo-style analysis with an extra operation of introducing degree arguments some other way. This conclusion lends support to Beck et al.'s (2009) suggestion that languages could vary along this very dimension, which was made on the basis of less in-depth study of one language in their cross-linguistic survey. I furthermore argued that analyzing Washo in this way lends indirect support for the degree-based analysis of English, since it highlights the empirical differences between languages that only manipulate contextual parameters for the interpretation of gradable predicates, comparisons, and related constructions, versus those that manipulate specialized semantic variables for those purposes.

This analysis of Washo raises several questions for further research, especially with respect to the manifestation of gradability in other domains in this language. First, as discussed in section 6.5, gradability and comparison has been shown to play an important role in aspectual composition, especially for degree-achievement verbs. Preliminary evidence suggests that the parameter of cross-linguistic variation proposed here may have repercussions in the aspectual properties of degree achievement verbs as well, though a more thorough investigation is left for future research.

Second, despite lacking degree variables in gradable predicates, Washo nevertheless has a fully articulated numeral system, as well as nominal quantifiers such as *míʔleʔ* 'every', and *t'éːk'eʔ* 'many'. Kennedy (2013) has recently argued for a degree-based analysis of numerals, at least for English. Such an analysis, coupled with the degree-less analysis for Washo proposed here, either predicts that we should find differences in the behavior of numerals in the two languages, or that the manifestation of a degree-based semantics for numerals is independent of gradability in the 'adjectival' domain. Third, Washo differs from English in an interesting and possibly relevant way in terms of their temporal reference systems. Whereas English makes only a two-way distinction between past and non-past reference, Washo has morphemes that distinguish grades of remoteness relative to utterance time. For instance, in the past time reference paradigm, the verbal suffix *-leg* indicates 'recent past', is used for reference times earlier in the same day as the utterance; *-ayʔ* 'intermediate past' is used for reference times earlier than the same day as the utterance, but not in the distant past; and *-lul* 'distant past' for reference times before the speaker's lifetime (Jacobsen, 1964). Clauses with these suffixes are typically translated by speakers using the English past tense, as shown in (405)-(407):

(405) *háʔašlegi*
       haʔaš-**leg**-i
       rain-**REC.PST**-IPFV
       'It was raining.'   (Jacobsen, 1964, p. 633)

(406) *midámaléːsayʔgi*
       mi-damal-eːs-**ayʔ**-i
       1SBJ.2OBJ-hear-NEG-**INT.PST**-IPFV
       'I didn't hear you.'   (Jacobsen, 1964, p. 636)

(407) *yéʔšuweʔluliʔišgi*
       ye-iʔiš-uweʔ-**lul**-iʔ-i-šgi
       fly-along-away-**DIST.PST**-ATTR-IPFV-SBJ.REL
       'He flew away long ago.'   (Jacobsen, 1964, p. 636)

Notions like 'recent', 'intermediate' and 'distant' are clearly scalar in nature, and gradable. Therefore, the existence of such a system in Washo raises questions on the nature of the connections

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between the encoding of scales and gradability in different conceptual domains. Specifically, what are the similarities and differences between gradability in the temporal domain, and in gradable predicates like *tall* (in English or Washo)? This question is particularly intriguing given the variation we have observed in the grammar of comparison and gradable predicates in Washo and English.

Chapter 7

TAKING STOCK ON CROSS-LINGUISTIC VARIATION

7.1   Summary of results

The empirical focus of this dissertation was constructions that are used to convey comparison in Luganda and Washo. In Luganda, exceed and cleft constructions were described and analyzed, and in Washo, conjoined and locative comparisons were the topic of investigation. The present study is among the first detailed descriptions and analyses of these constructions in any language from a formal semantic perspective.

For Luganda, exceed comparisons were shown to behave like explicit comparisons, while cleft constructions were shown to be implicit comparisons, according to the diagnostics of Kennedy (2007a). This means that Luganda exceed constructions make use of a dedicated comparative morpheme that introduces the comparative relation as part of its conventional meaning. I analyzed the exceed verb *-singa* as this element, and assigned it a comparative semantics. I furthermore argued that standard phrases in Luganda are always syntactically phrasal (i.e., they are always DPs). However, it was shown that the two-place versus three-place distinction, which is typically taken to track the clausal versus phrasal distinction, in fact cross-cuts this distinction. Specifically, Luganda makes use of a two-place comparative operator that compares two degrees, although syntactically it is two DPs that denote degrees that are the target and standard of comparison. By contrast, cleft comparisons do not contain such a morpheme, and the comparative interpretation of such structures is derived by inference, based on the general properties of vague predicates and the Consistency Constraints on their use (Klein, 1980, 1991; Kennedy, 2011).

In the case of Washo, both conjoined and locative comparisons were argued to be implicit comparisons, meaning that neither make use of a dedicated comparative morpheme. In both cases, the comparison interpretation arises pragmatically. In the case of conjoined comparisons, the comparison interpretation follows from the Consistency Constraints of vague predicates. For locative

comparisons, the comparison interpretation was taken to be a Gricean inference that arises due to the locative modification of stative predicates, which would otherwise be redundant. I also argued that locative modification of statives also requires a coerced type shift in the stative predicate that adds an eventuality argument that can be targeted by the locative. I suggested that such an operation may provide the basis for a semantic change leading to the development of locative comparisons cross-linguistically. The observation that Washo lacks a comparative morpheme led to the hypothesis that gradable predicates in Washo do not introduce degree variables that can be targeted by degree morphology. This predicted that Washo would lack degree constructions altogether, not just comparatives, which was shown to in fact be the case. Therefore, a major point of cross-linguistic variation lies in the lexical semantics of gradable predicates, specifically in whether they introduce degree arguments of not, in support of the hypothesis of Beck et al. (2009).

In the remainder of this chapter, I revisit the picture of cross-linguistic variation in semantics that began this dissertation, in view of the results from Luganda and Washo.

7.2   Formal research and typology

As I have shown throughout this dissertation, the No Variation view of cross-linguistic variation is not correct, both for variation at the syntax-semantics interface and at the lexical level. We do in fact find important differences in these languages with respect to the expression of comparison and gradability. This conclusion, however, should not be taken as an argument against taking No Variation as the null hypothesis for investigating cross-linguistic semantics, following Matthewson (2001, 2013) and von Fintel & Matthewson (2008). At the same time, we find important underlying similarities between languages, despite variation in surface syntactic forms. This means that a purely surfacist typological approach should not be used as a methodology for making claims about cross-linguistic semantic variation. I maintain that an investigation into cross-linguistic semantics must begin with a strong null hypothesis, followed by rigorous testing that is informed by formal research, and it is only after this has taken place that semantic typologies can be developed.

The worry of Evans & Levinson (2009) that formal research predisposes one to an English-style analysis of other languages is clearly unfounded. Despite taking a formal semantic approach in this dissertation, several points of variation were discovered, and necessitated making adjustments to existing analyses for these phenomena from English. That is, by directly testing the relevant linguistic structures based on the results of formal research, we discovered several places where there are indeed important points of semantic variation. Additionally, investigating these phenomena from a formal perspective allowed us to also discover interesting points of non-variation across languages, which might have otherwise been overlooked by simply inspecting surface forms. For instance, we found evidence that the compositional mechanisms at work for deriving three-place phrasal comparatives in Luganda is strikingly similar to what has been proposed for other languages. Both the argument structure of the comparative and its scope-taking possibilities were shown to be the same as what has been proposed by Bhatt & Takahashi (2007, 2011) for Hindi, and by Merchant (2009) for Greek. Discovering these similarities required positing a certain level of abstractness in the analysis of these languages, which proponents of the purely surfacist version of the Transparent-Mapping hypothesis argue against.

This approach to cross-linguistic research therefore allows us to both discover *variation* where it exists, but also *non-variation* where we may not otherwise expect it. The discovery of variation under this view also comes about in a more principled way. Specifically, we test the null hypothesis by targeting specific aspects of the semantics of the relevant constructions that have been shown to hold in other languages, for example the explicit/implicit comparison distinction. When we discover a point of variation, we are then able to constrain our theorizing about its source since we are using diagnostics that target certain aspects of the semantic interpretation. By contrast, taking a purely surfacist view forced the researcher to take that surface variation at face value. When variation is discovered in this case, we have no principled way of pinpointing its source, since we do not expect to find principled connections between languages that display different surface structures.

As a thought experiment, let us consider an alternative analysis of Washo, had the empirical facts turned out to be different. The surface form of Washo conjoined comparisons leads us to believe that there is no comparative morpheme present. The Transparent-Mapping hypothesis comes to this conclusion simply be inspecting surface forms. We indeed reached this conclusion in chapter 5, but only after probing conjoined comparisons for specific properties of their interpretation (e.g. their behavior in crisp judgment contexts, and with absolute-standard predicates). In this case, it seems that taking either No-Variation or Transparent-Mapping as the starting point would have yielded the same results. However, we could imagine that things could have turned out differently. For instance, imagine that we were investigating comparisons in Washo′, a language whose surface forms are identical to Washo, but where conjoined comparisons behave exactly like English *-er/more* comparatives in crisp judgment contexts and with absolute-standard predicates. In this scenario, Washo′ and English look much more similar than we would have otherwise expected, given the differences in their surface forms. But we would not have discovered these similarities between the two languages had we taken surface forms at face value. It was only after a rigorous investigation based on the results of previous formal research that we discovered a surprising lack of variation between Washo′ and English.

In sum, I reject a purely surfacist version of Transparent-Mapping as the starting point of an investigation into cross-linguistic semantics, and maintain that cross-linguistic research in semantics is best conducted by testing a strong null hypothesis such as No-Variation or a supplemented version of Transparent Mapping that allows for abstract analyses of linguistic data. We then subject the relevant linguistic forms to testing based on the results of past formal research in order to discover points of variation and non-variation. Once this type of investigation of particular constructions has been completed for several languages, we can begin to make informed cross-linguistic comparisons and formulate formal semantic typologies.

7.3 Locating variation

Having proposed in chapter 1 that there are two main types of semantic variation, I now review the points of variation discovered in this dissertation in terms of this split between variation at the lexical semantic level, and at the syntax-semantic interface. As we have already seen, these two categories are not mutually exclusive, and in particular aspects of variation at the syntax-semantics interface can be conditioned in part by variation at the lexical level.

7.3.1 Aspects of lexical variation

Let us first consider the comparative morpheme in Luganda. I proposed that there is no variation between English and Luganda in terms of amount of lexicalization. That is, both the exceed verb *-singa* and the comparative *-er/more* in English introduce a comparative relation between two degrees. The difference between the two languages instead has to do with the location of lexicalization. Whereas the comparative relation in English is lexicalized as an affix (or adverb), it is lexicalized in a verb in Luganda. This fact, however, has an important consequence for the syntax-semantics interface as well. Probably the most striking difference has to do with the fact that the comparative morpheme (exceed verb) in Luganda can appear as a matrix verb, or in a subordinate form. Given its status as a verb, this is not surprising: verbs in general can appear as matrix predicates or be subordinate to other predicates. However, what may seem surprising is that despite this, the interpretation and semantic argument structure of comparative morphemes in English and Luganda are strikingly uniform.

Another point related to location of lexicalization has to do with the division of labor between comparative morphology and standard-marking morphology across languages. As discussed in chapter 2, it is standard to assume that all the comparative semantics is localized in the comparative morpheme, and to analyze the standard morphology as semantically vacuous. This view has recently been challenged by work by Alrenga et al. (2012) and Schwarzschild (2012a). In particular, Alrenga et al. argue that the semantic burden is split between comparative morphology and

standard markers, and they suggest that in languages that only have overt standard marking and no comparative morphology, that the standard morphology carries all the comparative semantics. But in Luganda, the distinction between the comparative morpheme and the standard marker is neutralized, and there is only one element that effectively performs both functions: it lexicalizes the comparative semantics, and its direct object is the standard.

Finally, we observed variation in the lexicalization of gradable predicates in Luganda, which can be adjectives, verbs or nouns. I proposed that the ones lexicalized as adjectives in verbs have the same lexical semantics as gradable adjectives in English: they encode measure functions and denote relations between individuals and degrees. By contrasts, the ones lexicalized as nouns do not directly encode measure functions, and that the relation between degrees and individuals must be derived. Thus, the amount and location of lexicalization varies among expressions that name gradable properties within a single language. This fact also has consequences for the syntax-semantics interface. Specifically, those properties that are lexicalized as nouns must combine with possessive morphology in order to be used as gradable predicates, following Koontz-Garboden & Francez (2010) and Francez & Koontz-Garboden (2012) on Ulwa.

As for Washo, the most important point of variation discovered was that gradable predicates in this language do not introduce degree variables. This represents a point of variation in the amount of lexicalization. Since this language does not seem to make use of degree variables at all, the question of their location of lexicalization does not arise. But once again, this point of lexical variation has direct consequences for the syntax-semantics interface. Namely, Washo does not have any degree constructions. To put it another way, Washo seems to lack the syntactic category Deg. Given that Washo also lacks a separate syntactic category of adjectives, we may wonder whether these two facts are related. The answer, I believe, is no. For instance, in Luganda we see that gradable predicates that are lexicalized as adjectives, verbs, or nouns all participate in comparative constructions in the same way, modulo the syntactic features specific to that category (e.g. possessive morphology with nouns; differences in agreement and tense marking on adjectives

and verbs). A similar conclusion has been reached for other languages that seem to lack a syntactic category of adjectives, e.g. Howell (2013) and Vanderelst (2010) for Yorùbá; and Baglini (2012) for Wolof. Thus, the presence of Deg does not seem to be dependent on the presence of adjectives in a particular language.

As we have seen, the aspects of lexical variation that we have encountered all seem to have some reflexes on the syntax-semantics interface as well. This raises the question of whether there are in fact any aspects of lexical variation that do not have repercussions for the syntax-semantics interface. I suggest the following generalization: variation in the lexicalization of functional meanings has an effect on the syntax-semantics interface. All the lexical variation we examined has to do with functional meanings: introducing degree variables in Washo; encoding of measure functions in Luganda; and going back to the discussion from chapter 1 on nominal reference by Chierchia (1998), atomicity. By contrast, I predict that variation in non-functional meaning will not necessarily lead to variation at the syntax-semantics interface. For example, the difference between *cat* and *dog* across languages should not have the same syntactic repercussions as whether gradable predicates introduce degree variables or not. Although these lexical items might belong to different inflectional paradigms in a language, we would not expect to find differences in their external syntax that would be traced back to the lexical features of those expressions. This hypothesis should be subject to further study in future research on semantic variation.

7.3.2 *Aspects of variation at the syntax-semantics interface*

We also encountered plenty of variation at the syntax-semantics interface. In addition to the ones we have already reviewed, standards in Luganda exceed comparisons were argued to be uniformly phrasal. This is cast as a syntactic generalization: the exceed verb *-singa* only selects for DPs. Additionally, (un-)availability of certain readings and ambiguities in exceed constructions was traced to constraints on syntactic or LF movement operations.

However, in contrast with what we observed with variation at the lexical level, it seems that

variation at the syntax-semantics interface does not necessarily entail any lexical variation. For instance, while Luganda exceed comparisons always have phrasal standards, this fact does not constrain the semantic type of the standard (it was shown to be either type *e* or *d*), nor the availability of a two-place comparative operator in this language. What this leads us to conclude is that certain syntactic facts have semantic underpinnings, while others do not. For instance, the availability of the category Deg depends on whether the language makes use of degree variables or not. Likewise, the presence of possessive morphology with nouns that name gradable properties comes from the fact that they do not have a semantics that allows them to be used as predicates of individuals directly. Meanwhile, the phrasal-clausal distinction a purely syntactic distinction, and is not a reflex of some underlying lexical semantic distinction. Once again, I submit that these observations must be admitted for further scrutiny in future research on cross-linguistic variation, both on comparatives and other aspects of grammar.

7.4   Making comparisons vs. comparative constructions

Now that we have examined in detail several constructions that are used to make comparisons across languages, I would like to return to Stassen's (1985) definition of comparative constructions, which I repeat here.

(408)   A construction in a natural language counts as a comparative construction … if that construction has the semantic function of assigning a graded (i.e. non-identical) position on a predicative scale to two (possibly complex) objects.

In chapter 1, I took this definition as the starting point of the investigation, in order to identify the sorts of constructions that would be admitted for study. This meant that in Luganda we looked at both exceed and cleft comparisons, and in Washo both conjoined and locative comparisons. All these constructions fall under the definition of a comparative construction in (408). I claimed that a virtue of the definition in (408) was that it is purely semantic, and as such does not limit the scope

of our investigation based on morphosyntactic facts.

However, as we have seen in this dissertation, there are important semantic facts that distinguish the different constructions used for expressing comparison. In particular, only exceed constructions in Luganda were shown to involve a morpheme that directly encodes the comparative relation. All the other constructions considered here do not involve a dedicated comparative morpheme, and consequently display different semantic behaviors compared to English *-er/more* comparatives and Luganda exceed comparatives. Thus, (408) picks out a class that is too heterogeneous, and cannot be used as a basis for drawing conclusions about the semantic behavior of particular constructions used to make comparisons across languages. I have argued in this dissertation that distinctions such as explicit versus implicit comparison, which are based on formal research, are relevant for a complete investigation and analysis of such constructions. Unfortunately, this sort of information is typically absent from reference grammars upon which typological work such as Stassen's are based. Worse, Stassen explicitly rejects the contribution of formal semantic research in comparatives in well-studied languages such as Cresswell (1976) and von Stechow (1984) in pursuing his typological goals (Stassen, 1985, p. 199). It should go without saying at this point that I do not agree with this point of view at all. It is only through detailed formal research on individual languages that we discover interesting points of (non-)variation, and can begin to develop semantic typologies.

I therefore argue that using the definition in (408) to identify *comparative constructions* is problematic, and propose the following terminological revisions for the purposes of developing formal semantic typologies in this domain. Specifically, I propose that (408) be used to identify constructions that are used to make comparisons in a particular language, and that these should be called *comparison constructions*. Meanwhile, the term *comparative construction* should be reserved for comparison constructions that are found to make use of comparison constructions that make use of a dedicated morpheme (i.e., Kennedy's explicit comparisons). As such, the use of the term *comparative construction* becomes more specialized, and can now be used to identify a subset

of *comparison constructions*. An immediate consequence of this re-definition is that there are languages that lack *comparative constructions* in the sense intended here. In particular, Washo is such a language. Furthermore, this means that if we want to study *comparative constructions* across languages, we know we are investigating constructions that have a certain semantic equivalence. Once this initial distinction is made, we can then proceed to study further divisions within the class of comparative constructions, or within the class of implicit comparisons. It is my hope that grammar writers pay attention to formal semantic research, such as the study presented here, and incorporate some of the relevant tests in their fieldwork, in order to provide language descriptions that are more useful to researchers in formal semantics.

7.5   Closing remarks

In this dissertation I hope to have made a contribution on at least three points: the description and formal analysis of understudied constructions for making comparisons in two understudied languages; our understanding of the nature of cross-linguistic variation in the meaning component of grammar; and the methodological aspects of discovering such variation in the first place. It is my hope that this work can serve as a model not only for investigating gradability and comparison in under-studied languages, but also as a guide for discovering cross-linguistic variation through the methodologies advocated for here. Given the high rates of language endangerment, this type of detailed semantic investigation in understudied languages is crucial for our theorizing on the range and limits of cross-linguistic variation, and understanding of the nature of the human language faculty.

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