

Chapter 22

Two-place exceed comparatives in Luganda

M. Ryan Bochnak

University of Konstanz

Research on comparative constructions recognizes the need for both a 3-place (“phrasal”) comparative operator, alongside a 2-place (“clausal”) operator (e.g., Heim 1985; Bhatt & Takahashi 2011). Recent cross-linguistic work on comparatives has argued that exceed comparative constructions are phrasal comparatives, making use of a 3-place operator (e.g., Beck et al. 2009; Howell 2013 for Yorùbá). While certain exceed constructions in Luganda can indeed be analyzed in this way, I argue here for the idea that others involve a 2-place operator that compares two degrees directly. I treat nominalized adjectives as measure functions in the sense of Bartsch & Vennemann 1972 and Kennedy 1997: they map an individual to its maximal degree on a scale. This allows us to model possessed adjective nominalizations similar to Barker’s (1995) analysis of relational nouns, although whereas for Barker a possessive DP denotes a predicate of individuals, in this case the resulting DP denotes a degree.

1 Introduction

Formal research on comparatives distinguishes between PHRASAL COMPARATIVES (1) and CLAUSAL COMPARATIVES (2), depending on the syntactic category of the standard phrase (complement of *than*; angled brackets represent ellipsis).

- | | |
|--|---------|
| (1) Kim is taller than [DPLee]. | PHRASAL |
| (2) Kim is taller than [CPLee is <tall>]. | CLAUSAL |

Along with their different syntax, phrasal and clausal comparatives are taken to have different semantic representations (Bhatt & Takahashi 2011; Heim 1985; Kennedy 1997: among others). While phrasal comparatives involve an operator with three argument positions, clausal comparatives involve an operator with two argument positions (see (3); the standard semantic analyses of these will be unpacked in §2).

- (3) a. phrasal comparison ↔ 3-place comparative operator
b. clausal comparison ↔ 2-place comparative operator



In this paper, I challenge the assumption that the syntax-semantics mapping in comparatives is necessarily as in (3), based on a study of *exceed*-comparison in Luganda (Bantu; JE15). Recent work has argued that *exceed*-comparatives are strictly phrasal and therefore make use of a 3-place comparative operator (Beck et al. 2009; Howell 2013 for Yorùbá). I too will argue that *exceed* comparatives in Luganda are syntactically phrasal comparatives, and that most *exceed* constructions can be analyzed as involving a 3-place operator. *Exceed* constructions in Luganda come in two varieties: the verb *okusinga* ‘to exceed’ can appear as the main verb as in (4), or in a subordinate (infinitive) form as in (5). In main verb *exceed* constructions, the gradable predicate appears in a nominalized form (with the noun class 14 prefix *bu-*), while in subordinate *exceed* constructions, the gradable predicate appears as the main predicate of the sentence (showing noun class agreement with the subject).

- (4) 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
- (5) 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

However, I will argue that “subcomparatives” in Luganda are syntactically phrasal but make use of a 2-place “clausal”-like comparative operator. An example of this construction is given in (6), where the two arguments of *exceed* are delineated by square brackets, and are both DPs headed by nominalized gradable predicates. (A licit subcomparative in English is given in the translation line of (6).)

- (6) [Obuwanyu 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 order for this idea to go through, I will also need to provide an analysis of nominalized (NC14 *bu*-marked) adjectives in Luganda. To do this, I will build on the intuitions of Moltmann (2009) and Nicolas (2004) that nominalizations of gradable adjectives are relational, as well as on the standard degree-based analysis of gradable adjectives (Cresswell 1976; Kennedy & McNally 2005; von Stechow 1984: among others).

The consequences of this analysis are the following: (i) there is novel evidence for two-place comparatives for *exceed* languages, which has not previously been adduced; and (ii) at least some syntactically phrasal comparatives can receive a two-place comparative analysis, contra the mappings in (3). This paper proceeds as follows: §2 provides an

overview of the phrasal vs. clausal distinction; §3 outlines a three-place operator analysis of phrasal comparatives in Luganda; in §4 I argue for the existence of a two-place operator in Luganda based on evidence from subcomparatives, and I consider two types of analyses for nominalized gradable predicates; §5 concludes.

2 The composition of comparatives

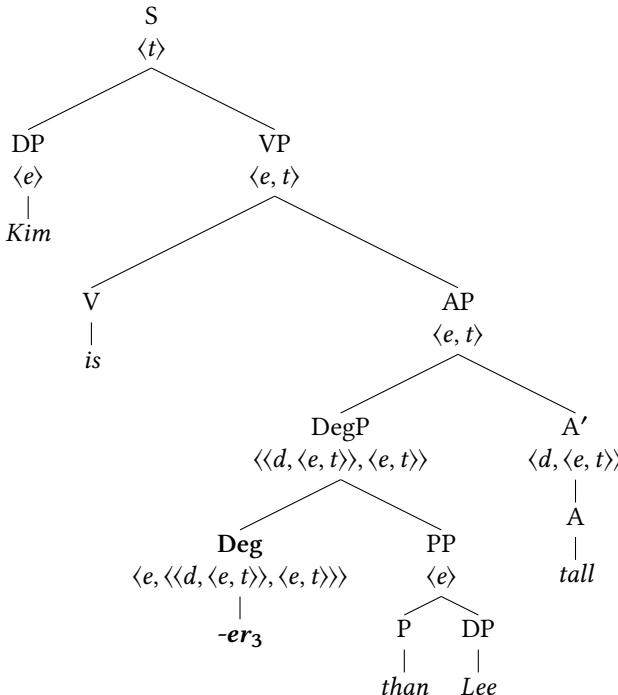
2.1 Phrasal comparatives

A phrasal comparative like (7) in English can be analyzed as involving the 3-place comparative operator in (8). The arguments of the operator are two individual arguments (the standard and target of comparison), and the gradable predicate that provides the scale for comparison. A gradable predicate is taken to denote a relation between an individual and a degree, as in (9).

- (7) Kim is taller than [DP Lee].
- (8) 3-place *-er* for phrasal comparatives:
 $\llbracket \text{-}er_3 \rrbracket = \lambda x \in D_e \lambda G \in D_{\langle d, \langle e, t \rangle \rangle} \lambda y \in D_e \max(\lambda d. G(d)(y)) > \max(\lambda d'. G(d')(x))$
- (9) $\llbracket \text{tall} \rrbracket = \lambda d \lambda x. \text{height}(x) \geq d$ (Cresswell 1976; Kennedy & McNally 2005)

A sample derivation of (7) is given in (10)-(11), assuming that DegP is the sister of A' (Heim 2001), *than* is semantically vacuous, and the *than* phrase extraposes at PF.

(10)



- (11) a. $\llbracket \text{Deg} \rrbracket = \llbracket \text{-er}_3 \rrbracket = \lambda x_{\langle e \rangle} \lambda G_{\langle d, \langle e, t \rangle \rangle} \lambda y_{\langle e \rangle} \max(\lambda d. G(d)(y)) > \max(\lambda d'. G(d')(x))$
 b. $\llbracket \text{PP} \rrbracket = l$
 c. $\llbracket A' \rrbracket = \llbracket \text{tall} \rrbracket = \lambda d \lambda x. \text{height}(x) \geq d$
 d. $\llbracket \text{DegP} \rrbracket = \llbracket \text{Deg} \rrbracket (\llbracket \text{PP} \rrbracket) = \lambda G \lambda y. \max(\lambda d. G(d)(y)) > \max(\lambda d'. G(d')(l))$
 e. $\llbracket \text{VP} \rrbracket = \llbracket \text{AP} \rrbracket = \llbracket \text{DegP} \rrbracket (\llbracket \text{AP} \rrbracket) = \lambda y. \max(\lambda d. \text{height}(y) \geq d) >$
 $\max(\lambda d'. \text{height}(l) \geq d')$
 f. $\llbracket S \rrbracket = \llbracket \text{VP} \rrbracket (\llbracket \text{DP} \rrbracket) = 1 \text{ iff } \max(\lambda d. \text{height}(k) \geq d) > \max(\lambda d'. \text{height}(l) \geq d')$

The truth conditions for the sentence can be paraphrased as “the maximal degree to which Kim is tall is greater than the maximal degree to which Lee is tall.”

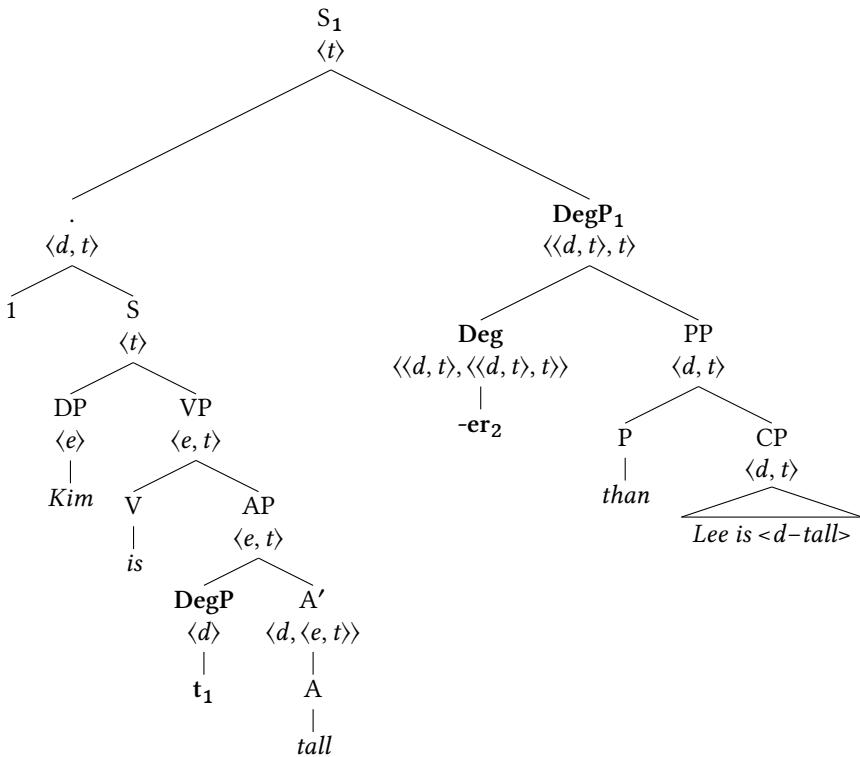
2.2 Clausal comparatives

Meanwhile, clausal comparatives like (12) are analyzed in terms of the two-place comparative operator in (13). The two arguments of two-place *-er* are both sets of degrees (type $\langle d, t \rangle$ functions), which are derived in syntax by movement.

- (12) Kim is taller than [CP Lee is <tall>].
 (13) **2-place *-er* for clausal comparatives:**
 $\llbracket \text{-er}_2 \rrbracket = \lambda D_1 \in D_{\langle d, t \rangle} \lambda D_2 \in D_{\langle d, t \rangle} \max(D_2) > \max(D_1)$

A sample derivation of (12) is given in (14), assuming null operator movement within *than* phrase to derive a $\langle d, t \rangle$ function (this step not shown here; see Chomsky 1977), movement of DegP to derive another $\langle d, t \rangle$ function, and ellipsis within the *than* phrase.

(14)



- (15) a. $\llbracket \text{PP} \rrbracket = \lambda d'. \text{height}(l) \geq d'$
 b. $\llbracket \text{-er}_2 \rrbracket = \lambda D_1 \in D_{\langle d, t \rangle} \lambda D_2 \in D_{\langle d, t \rangle}. \max(D_2) > \max(D_1)$
 c. $\llbracket \text{DegP} \rrbracket = \llbracket \text{-er}_2 \rrbracket(\llbracket \text{PP} \rrbracket) = \lambda D_2. \max(D_2) > \max(\lambda d'. \text{height}(l) \geq d')$
 d. $\llbracket \text{A}' \rrbracket = \llbracket \text{tall} \rrbracket = \lambda d \lambda x. \text{height}(x) \geq d$
 e. $\llbracket \text{VP} \rrbracket = \llbracket \text{AP} \rrbracket = \lambda x. \text{height}(x) \geq d$
 f. $\llbracket \text{S} \rrbracket = \text{height}(k) \geq d$
 g. $\llbracket \cdot \rrbracket = \lambda d. \text{height}(k) \geq d$
 h. $\llbracket \text{S}_1 \rrbracket = \llbracket \text{DegP} \rrbracket(\llbracket \cdot \rrbracket) = \max(\lambda d. \text{height}(k) \geq d) > \max(\lambda d'. \text{height}(l) \geq d')$

Note that the exact same truth conditions are derived for 3-place and 2-place comparatives (compare (11f) and (15h)). With this background in place, we now turn to the analysis of *exceed* comparatives in Luganda.

3 A 3-place comparative operator in Luganda

Reviewing what we have already seen, comparatives in Luganda are formed using the verb *(oku)singa* ‘exceed’, where the direct object of *(oku)singa* is a DP naming the standard of comparison. *Exceed* comparatives in Luganda come in two varieties. In (16), the

exceed verb is the main verb, with a gradable predicate in nominalized form with the NC14 *bu*-prefix. In (17), the *exceed* verb phrase is in a subordinate (infinitive) form marked with the NC15 *ku*-prefix, while the gradable predicate is the main predicate.

- (16) 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
- (17) 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

Comparatives with (*oku*)*singa* can be used in quality comparisons (above), as well as amount comparisons, as shown in (18)-(19).¹

- (18) Charlotte **yasinga** Rita okuwandiika 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.’
- MAIN VERB EXCEED
- (19) 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.’
- SUBORDINATE EXCEED

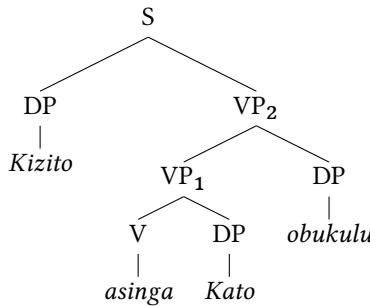
Given that the object of (*oku*)*singa* is a DP, this looks like phrasal comparison. Let us propose that (*oku*)*singa* has the semantics of three-place comparative *-er*₃ as in (20), where the direct object of (*oku*)*singa* (i.e., the standard of comparison) is an individual-denoting DP. Evidence for a degree-based analysis for Luganda comes from the fact that both the main verb and subordinate *exceed* constructions pass Kennedy’s (2007a) tests for explicit comparison, including acceptability in crisp judgment contexts, and the ability to be formed with absolute-standard gradable predicates (see Bochnak 2013 for these tests). This proposal thus makes Luganda similar to other *exceed* languages, such as Yorùbá, which has also been argued to use a 3-place operator (Beck et al. 2009; Howell 2013).

- (20) $\llbracket(\text{oku})\text{singa}_3\rrbracket = \llbracket-\text{er}_3\rrbracket =$
 $\lambda x \in D_e \lambda G \in D_{\langle d, \langle e, t \rangle \rangle} \lambda y \in D_e. \max(\lambda d. G(d)(y)) > \max(\lambda d'. G(d')(x))$

¹I assume a covert adjective *ma-ngi* ‘many’ is present in (18)-(19) to derive the amount comparison reading. The adjective may also appear overtly, but not shown here due to space. See Bochnak 2013.

The proposed structure and derivation of the main verb *exceed* comparative in (16) is given in (21)-(22).²

- (21) *Kizito asinga Kato obukulu.*
 ‘Kizito exceeds Kato in oldness.’



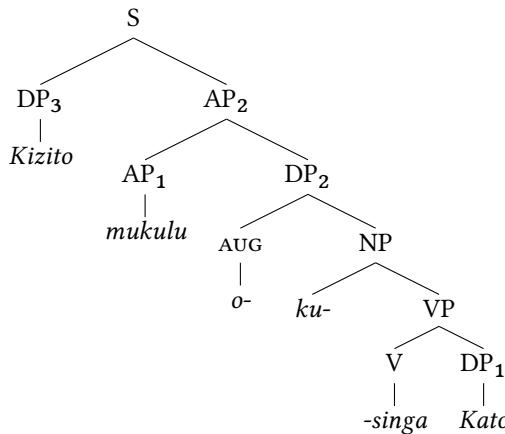
- (22)
- a. $\llbracket \text{asinga} \rrbracket = \lambda x \lambda G \lambda y. \max(\lambda d. G(d)(y)) > \max(\lambda d'. G(d')(x))$
 - b. $\llbracket \text{obukulu} \rrbracket = \lambda d \lambda x. \text{old}(x) \geq d$
 - c. $\llbracket \text{VP}_1 \rrbracket = \lambda G \lambda y. \max(\lambda d. G(d)(y)) > \max(\lambda d'. G(d')(Kato))$
 - d. $\llbracket \text{VP}_2 \rrbracket = \lambda y. \max(\lambda d. \text{old}(y) \geq d) > \max(\lambda d'. \text{old}(Kato) \geq d')$
 - e. $\boxed{\llbracket \text{S} \rrbracket = 1 \text{ iff } \max(\lambda d. \text{old}(Kizito) \geq d) > \max(\lambda d'. \text{old}(Kato) \geq d')}$

This analysis derives the intuitively correct truth conditions for the comparative: (16) is true if and only if the maximal degree to which Kizito is old is greater than the maximal degree to which Kato is old. It thus provides a straightforward derivation of main verb *exceed* constructions parallel to English phrasal comparatives. However, note that I have assigned a semantics for nominalized *bu-kulu* ‘NC14-old’ identical to that of gradable adjectives in English (cf. 9). If the underlying semantics of the gradable adjective stem *-kulu* ‘old’ is the same as gradable adjectives in English, this means that the nominalization morphology *bu-* is semantically vacuous. This assumption will be revised later on in §4, but for now it allows us to straightforwardly derive the truth conditions for the comparative with the semantic tools familiar from English.

For subordinate *exceed* constructions, let us assume the same three-place comparative operator semantics for *(oku)singa* in (20). Given the (simplified) structure for (17) as in (23), the semantic derivation proceeds as in (24).

- (23) *Kizito mukulu okusinga Kato.*
 ‘Kizito is old, exceeding Kato.’

²See Bochnak 2013 for arguments for the syntax proposed here.



- (24) a. $\llbracket \text{-singa} \rrbracket = \lambda x \lambda G \lambda y. \max(\lambda d. G(d)(y)) > \max(\lambda d'. G(d')(x))$
 b. $\llbracket \text{DP}_2 \rrbracket = \lambda G \lambda y. \max(\lambda d. G(d)(y)) > \max(\lambda d'. G(d')(Kato))$
 c. $\llbracket \text{mukulu} \rrbracket = \lambda d \lambda x. \text{old}(x) \geq d$
 d. $\llbracket \text{AP}_2 \rrbracket = \lambda y. \max(\lambda d. \text{old}(y) \geq d) > \max(\lambda d'. \text{old}(Kato) \geq d')$
 e. $\boxed{\llbracket \text{S} \rrbracket = 1 \text{ iff } \max(\lambda d. \text{old}(Kizito) \geq d) > \max(\lambda d'. \text{old}(Kato) \geq d')}$

Parallel truth conditions are thus derived for (16) and (17), and indeed these constructions appear to have the same truth conditions.³ Note once again the assumption that nominalization morphology (this time *ku-* on the verb phrase) is semantically vacuous.

In sum, both main verb and subordinate *exceed* comparatives in Luganda receive a straightforward analysis as three-place phrasal comparatives by borrowing the familiar tools from English and other better-studied languages. This seems like a nice result, given that other *exceed* languages have also been analyzed in this way.⁴ Furthermore, it has been noted for other languages that only three-place comparatives exist (e.g., Bhatt & Takahashi 2011 on Hindi/Urdu). That is, there is no reason to expect that a language necessarily uses both 3-place and 2-place comparison. However, in the next section I present evidence for the existence of two-place comparatives in Luganda, and propose an analysis involving a two-place version of the *exceed* verb.

³ Again, they are both acceptable in crisp judgment contexts and are productive will gradable predicates of all scale structures (Bochnak 2013). However, my consultants seem to have a preference for subordinate *exceed* constructions, in that they are almost always offered first as translations of English. The corresponding main verb versions are nevertheless always accepted by speakers when offered by the researcher. I have no explanation for this apparent preference.

⁴ In an LFG-based analysis, Beermann et al. (2005) likewise propose a common semantics for comparison between English and Luganda, despite their different syntactic structures.

4 A 2-place comparative operator in Luganda

One of the tests for diagnosing clausal (2-place) comparatives is the availability of multiple standards of comparison (Lechner 2001; Merchant 2009; Bhatt & Takahashi 2011). For instance, (25) contains three standards of comparison following *than*. The idea is this: the apparent phrasal surface form of comparatives like *Kim is taller than Lee* is the result of ellipsis applying to an underlyingly clausal complement of *than*, where the standard has moved out of the ellipsis site. Multiple standards can appear after *than* so long as they have all moved out of the ellipsis site.⁵

- (25) Kim read more books on Tuesday than Lee magazines on Thursday.

Multiple standards in Luganda, however, are not licensed, either in main verb (26) or subordinate (27) *exceed* constructions.⁶

- (26) * [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

- (27) * 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] [ku lw'okubiri].
 Rita ku lw'okubiri
 Rita LOC Tuesday
- Intended: ‘Charlotte wrote more letters on Monday than Rita wrote
 on Tuesday.’

SUBORDINATE

A second test for the availability of clausal comparatives comes from SUBCOMPARATIVES: comparisons based on two different dimensions. An English example is given in (28). In this case, the complement of *than* has overt clausal syntax.

- (28) The table is longer than it is wide.

⁵See Lin (2009) for arguments that comparatives with multiple standards in Chinese are still phrasal in nature, and not the result of ellipsis from a clausal source. In other words, the ability to have multiple standards does not necessarily entail that there is an underlying clausal source, so this test does not provide strong evidence for diagnosing clausal comparatives.

⁶(26)-(27) contain the adjective *ma-ngi* ‘many’; cf. footnote 1 and (18)-(19). Its presence/absence does not affect the grammaticality of these sentences.

Versions of these types of comparisons are possible using the Luganda main verb *exceed* construction, as shown in (30). However, the constituents forming the comparison are not full clauses. Rather, the subject and object of *okusinga* are headed by nominalized gradable adjectives (bolded in 30), which name the two dimensions of comparison. These nominalizations appear in a possessive construction, the general form of which is given in (29), where GEN is the genitive particle.⁷

- (29) possessed adjective nominalizations = [bu-adj + GEN + possessor]
- (30) **Obuwanyu 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.’

I suggest that this is a case of 2-place comparison in Luganda, despite the fact that these are not syntactically clausal comparatives (i.e., no clausal syntax in the standard). To see how this would work, we need an analysis of possessed nominalized adjectives. I consider two styles of analysis here, which both deliver the desired result.

The first style of analysis I will call the RELATIONAL ANALYSIS, following the intuitions of Moltmann (2009) and Nicolas (2004) that nominalized properties like *length* are inherently relational. That is, a nominalized adjective like *bu-wanvu* ('NC14-long' ≈ 'length'/'longness') relates an individual to its length. Given that gradable adjectives are also standardly taken to denote relations between individuals and degrees (Cresswell 1976; Heim 2001; Kennedy & McNally 2005), it seems at first blush that the assumption we made in §3 that nominalization is vacuous is a reasonable one. However, rather than assuming that nominalizing *bu-* is vacuous, I propose it has the function of reversing the argument relations of a gradable adjective; the difference between the gradable adjective and its nominalized form is thus given in (31)-(32).

- (31) $\llbracket \text{-wanvu} \rrbracket = \llbracket \text{long} \rrbracket = \lambda d \lambda x. \text{length}(x) \geq d$ $\langle d, \langle e, t \rangle \rangle$
- (32) $\llbracket \text{bu-wanvu} \rrbracket = \lambda x \lambda d. \text{length}(x) \geq d$ $\langle e, \langle d, t \rangle \rangle$

This change of argument structure means that a nominalized adjective expects an individual as its first argument, which will be the possessor *x* of the property. After saturating the individual argument position, we are left with a set of degrees that *x*’s length is greater than or equal to. Thus, the DP *obuwanyu bw’emmeeza* (≈ ‘the length of the table’) denotes the set of degrees in (33).

- (33) $\llbracket \text{obuwanyu bw’emmeeza} \rrbracket = \lambda d. \text{length}(t) \geq d$

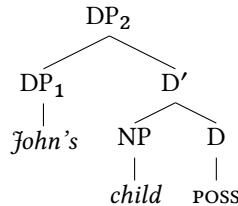
For a compositional analysis, I follow the syntax of possession proposed by Barker (1995). On Barker’s analysis, the possessive DP is headed by a possessive D head POSS, which is null in English. For non-relational nouns (e.g., *table*), POSS introduces the possessive relation π , as shown in (34). For inherently relational nouns, POSS is still present,

⁷Note that *bu-* on GEN,POSS, and *-singa* are inflectional prefixes for agreement with a NC14 noun.

but simply denotes the identity function ($\lambda R.R$). Barker's analysis of possessed relational nouns in English is outlined in (35)-(36).

$$(34) \quad [\text{POSS}] = \lambda P \lambda y \lambda z. \pi(y, z) \wedge P(z)$$

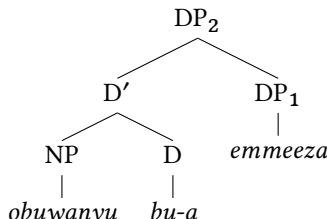
(35)



- (36) a. $[\text{child}] = \lambda x \lambda y. \text{child}(x, y)$
- b. $[\text{POSS}] = \lambda R.R$
- c. $[\text{John's child}] = \lambda y. \text{child}(j, y)$

I propose for Luganda that the genitive particle *-a* is the overt spell-out of Barker's poss. The analysis for the possessive nominalized adjective *obuwanvu bw'emmeeza* 'the length of the table' is thus given in (37)-(38), whereby the nominalized adjective denotes a relational noun, and the result of applying the possessor is a (characteristic function of a) set of degrees of length.

(37)

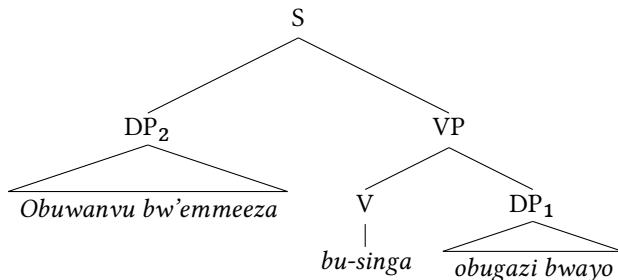


- (38) a. $[\text{obuwanvu}] = \lambda x \lambda d. \text{length}(x) \geq d$
- b. $[\text{-a}] = [\text{POSS}] = \lambda R.R$
- c. $[\text{obuwanvu bwa}] = \lambda x \lambda d. \text{length}(x) \geq d$
- d. $[\text{obuwanvu bw'emmeezza}] = \lambda d. \text{length}(t) \geq d$

Now let's return to the exceed comparative we want to analyze, namely (30). Under the analysis of possessed adjective nominalizations proposed here, the subject and object of *okusinga* 'exceed' both denote sets of degrees. But these are exactly the arguments that a 2-place comparative operator expects (cf. 13). If we submit that *okusinga* has a 2-place variant as in (39), the analysis of (30) can proceed straightforwardly as in (40)-(41).

$$(39) \quad [(oku)singa_2] = [-er_2] = \lambda D1 \in D_{\langle d, t \rangle} \lambda D2 \in D_{\langle d, t \rangle}. \max(D2) > \max(D1)$$

(40)



- (41) a. $\llbracket V \rrbracket = \llbracket (oku)singa_2 \rrbracket = \llbracket -er_2 \rrbracket = \lambda D1 \in D_{\langle d, t \rangle} \lambda D2 \in D_{\langle d, t \rangle}. \max(D2) > \max(D1)$
 b. $\llbracket DP_1 \rrbracket = \lambda d. \text{width}(t) \geq d$
 c. $\llbracket VP \rrbracket = \lambda D2. \max(D2) > \max(\lambda d. \text{width}(t) \geq d)$
 d. $\llbracket DP_2 \rrbracket = \lambda d. \text{length}(t) \geq d$
 e. $\boxed{\llbracket S \rrbracket = 1 \text{ iff } \max(\lambda d. \text{length}(t) \geq d) > \max(\lambda d. \text{width}(t) \geq d)}$
 = “the maximal degree to which the table is long is greater than the maximal degree to which it is wide”

I refer to the second style of analysis for adjective nominalizations as the MEASURE FUNCTION analysis. The idea is that instead of denoting relations, nominalized gradable adjectives instead denote measure functions directly, i.e., functions from individuals to the maximal degree to which they hold a property (Kennedy 2007b). Under this analysis, the denotation of *obuwanyu* ‘length’ would be modeled as in (42).

$$(42) \quad \llbracket obuwanyu \rrbracket = \lambda x. \text{length}(x) \quad \text{type } \langle e, d \rangle$$

Such an analysis has the following consequences. First, in the genitive construction, a possessed nominalized adjective denotes a degree (instead of a set of degrees), as in (43).

$$(43) \quad \llbracket obuwanyu bw'emmeezza \rrbracket = \text{length}(t)$$

Second, we require a modified lexical entry for 2-place *exceed*, reflecting this type difference. Under this analysis, *okusinga* compares two degrees directly, as in (44). The derivation in (40) proceeds in the same was as before; it’s only the type of the arguments of the comparative operator that are different. Also note that there are no maximality operators within the semantics of *oksuinga* under this analysis: maximality comes for free from the measure function itself.

$$(44) \quad \llbracket -singa_2 \rrbracket = \lambda d \in D_d \lambda d' \in D_d. d' > d$$

Third, if we continue to assume a relational (type $\langle d, \langle e, t \rangle \rangle$) analysis for gradable adjectives, then the nominalizing *bu-* morphology now has the function of turning the gradable adjective into the corresponding measure function, as in (45).⁸

- (45) $\llbracket bu-\rrbracket = \lambda G \in D_{\langle d, \langle e, t \rangle \rangle} \lambda x. m_G(x)$
where m_G is the measure function associated with a gradable predicate G

Finally, the measure function analysis allows for a more straightforward analysis of nominalized adjectives in argument position, an example of which is given in (46).

- (46) Obuwanyu 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.'

Intuitively, it is Lydia's maximal degree of height that is surprising, not any smaller degree of height. Once again, the measure function analysis of nominalized adjectives gets maximality for free, whereas the relational analysis must posit an ad hoc maximality operator to turn the $\langle d, t \rangle$ expression into a degree.⁹

Summarizing, I take evidence from subcomparatives to indicate that Luganda has a two-place version of the comparative operator, alongside a three-place variant. There are two plausible analyses of nominalized gradable adjectives that allow for a straightforward analysis of two-place *exceed* comparatives like (30). While I do not come down definitively in favor of either the relational or measure function analysis for nominalized gradable adjectives, examples like (46) may point towards the measure function analysis.

5 Conclusion

I have argued for the existence of (at least) two versions of (*oku*)*singa* qua comparative operator in Luganda, namely those in (47)-(48).¹⁰

- (47) 3-place comparative:
 $\llbracket (oku)singa_3 \rrbracket = \lambda x \lambda G \lambda y. \max(\lambda d. G(d)(y)) > \max(\lambda d'. G(d')(x))$

⁸Alternatively, if we take as a starting point a measure function analysis of gradable adjectives (Bartsch & Vennemann 1972; Kennedy 2007b), then we maintain that *bu-* is semantically vacuous:

(i) $\llbracket \neg wanvu_A \rrbracket = \llbracket obuwanyu_N \rrbracket = \lambda x. \text{length}(x)$

⁹Of course, this also involves making the non-trivial assumption that predicates like *wunyisa* 'surprise' can be predicates of degrees. See Castroviejo & Schwager (2008) and Molmann (2009) for discussion of related issues.

¹⁰Which version of the 2-place operator in (48) we choose depends on whether we adopt the relational or measure function analysis of nominalized gradable adjectives.

- (48) 2-place comparative:

$$[(oku)singa_2] = \lambda D1 \lambda D2. \max(D2) > \max(D1)$$

or

$$[(oku)singa_2] = \lambda d \lambda d'. d' > d$$

Significantly, Luganda has a 2-place *exceed* comparative despite having only syntactically “phrasal” standards. This results in an important consequence for theories of comparatives cross-linguistically, namely that having only syntactically phrasal standards does not necessarily entail the absence of 2-place comparatives. Meanwhile, the right analysis for nominalization depends on our starting assumptions about the underlying meaning of gradable adjectives and the semantic type of possessed adjective nominalizations.

Acknowledgments

I thank Kisuuule Magala Katende for his patience and enthusiasm for working with me on his language. I also thank Karlos Arregi, Chris Kennedy, Jason Merchant, two anonymous reviewers, as well as audiences at the University of Chicago, UC Berkeley, ACAL 45 at the University of Kansas, and the Semantics of African, Asian, and Austronesian Languages at the University of Tübingen for comments and criticisms. The usual disclaimers apply.

Abbreviations

AUG	augment	NC#	noun class
CLEFT	cleft	POSS	possessive
GEN	genitive marker	PST	past
LOC	locative		

References

- Barker, Chris. 1995. *Possessive descriptions*. Stanford, CA: CSLI Publications.
- Bartsch, Renate & Theo Vennemann. 1972. The grammar of relative adjectives and comparison. *Linguistische Berichte* 20. 19–32.
- Beck, Sigrid, Sveta Krasikova, Daniel Fleischer, Remus Gergel, Stefan Hofstetter, Christiane Savelsberg, John Vanderelst & Elisabeth Villalta. 2009. Crosslinguistic variation in comparative constructions. In Jeroen van Craenenbroeck & Johan Rooryck (eds.), *Linguistic Variation Yearbook*, vol. 9, 1–66. Philadelphia: John Benjamins. DOI:10.1075/livy.9.01bec
- Beermann, Dorothee, Jonathan Brindle, Lars Hellan, Solomon Telda, Janicke Furberg, Florence Bayiga & Yvonne Otoo. 2005. A comparison of comparatives. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of LFG05*, 42–53. Stanford, CA: CSLI Publications.

- Bhatt, Rajesh & Shoichi Takahashi. 2011. Reduced and unreduced phrasal comparatives. *Natural Language and Linguistic Theory* 29. 581–620.
- Bochnak, M. Ryan. 2013. *Cross-linguistic variation in the semantics of comparatives*. Chicago: University of Chicago dissertation.
- Castroviejo, Elena & Magdalena Schwager. 2008. Amazing DPs. In Tova Friedman & Satoshi Ito (eds.), *Proceedings of Semantics and Linguistic Theory (SALT) XVIII*, 176–193. Ithaca, NY: CLC Publications.
- Chomsky, Noam. 1977. On wh-movement. In Peter Culicover, Thomas Wasow & Adrian Akmajian (eds.), *Formal syntax*, 71–132. New York: Academic Press.
- Cresswell, Max J. 1976. The semantics of degree. In Barbara Partee (ed.), *Montague Grammar*, 261–292. New York: Academic Press.
- Heim, Irene. 1985. Notes on comparatives and related matters. Ms. University of Texas at Austin.
- Heim, Irene. 2001. Degree operators and scope. In Caroline Féry & Wolfgang Sternefeld (eds.), *Audiatur Vox Sapientiae*, 214–239. Berlin: Akademie-Verlag.
- Howell, Anna. 2013. Abstracting over degrees in Yoruba comparison constructions. In Emmanuel Chemla, Vincent Homer & Grégoire Winterstein (eds.), *Proceedings of Sinn und Bedeutung 17*, 271–288. Paris. Talk presented at Sinn und Bedeutung 17.
- Kennedy, Christopher. 1997. *Projecting the adjective: The syntax and semantics of gradability and comparison*. University of California, Santa Cruz dissertation.
- Kennedy, Christopher. 2007a. Modes of comparison. In Malcolm Elliott, James Kirby, Osamu Sawada, Eleni Staraki & Suwon Yoon (eds.), *Chicago Linguistic Society (CLS) 43*. Chicago: Chicago Linguistic Society.
- Kennedy, Christopher. 2007b. Vagueness and grammar: The semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy* 30(1). 1–45. DOI:10.1007/s10988-006-9008-0
- Kennedy, Christopher & Louise McNally. 2005. Scale structure, degree modification and the semantics of gradable predicates. *Language* 81(2). 345–381. DOI:10.1353/lan.2005.0071
- Lechner, Winfried. 2001. Reduced and phrasal comparatives. *Natural Language and Linguistic Theory* 19(4). 683–735.
- Lin, Jo-wang. 2009. Chinese comparatives and their implicational parameters. *Natural Language Semantics* 17. 1–27.
- Merchant, Jason. 2009. Phrasal and clausal comparatives in Greek and the abstractness of syntax. *Journal of Greek Linguistics* 9. 134–164.
- Moltmann, Friederike. 2009. Degree structure as trope structure: A trope-based analysis of positive and comparative adjectives. *Linguistics and Philosophy* 32. 51–94.
- Nicolas, David. 2004. The semantics of nouns derived from gradable adjectives. In Cécile Meier & Matthias Weisgerber (eds.), *Proceedings of Sinn und Bedeutung 8*, 197–207.
- von Stechow, Arnim. 1984. Comparing semantic theories of comparison. *Journal of Semantics* 3. 1–77. DOI:10.1093/jos/3.1-2.1

