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Property concepts in Basaá and the ontology of gradability across category*

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Abstract

Theories of gradability and comparison (e.g., Kamp 1975, Cresswell 1977 and many following) have been developed with data from familiar languages like English with adjectives at their core. In many languages, however, the main predicate in truth-conditionally equivalent constructions – henceforth the *property concept* (PC) (cf. Dixon 1982) – is of a different category: that of a nominal, which is predicated through possession cross-linguistically. Francez and Koontz-Garboden (2017) argue for a semantics for such nouns as mereologically and size-ordered sets of abstract portions, a treatment that keeps with their exhibition of mass noun behavior, with possessive predications and comparatives involving these nouns built on such a semantics. A semantics of this kind is not standardly assumed for adjectives and constructions built on them in familiar languages, however, raising the question whether the truth-conditional equivalence of the constructions with nouns in languages that have them and the constructions with adjectives in languages that have them should be model-theoretically represented, a position assumed by Menon and Pancheva (2014), or whether this equivalence should be captured in some other way. Based on data from modification, degree questions, subcomparatives, and equatives in Basaá (Bantu; Cameroon), we show that adjectives and the *have*+PC noun construction must in fact have a type-theoretically identical semantics.

Keywords: gradability, degree modification, degree questions, comparatives, Basaá

1 Introduction

As documented in the philosophical and linguistic literature (see e.g., Kennedy 2012 for an overview), there are classes of properties that hold of an individual to some

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degree, rather than absolutely. Predicates expressing such properties lie at the heart of comparative constructions, in which some individual is asserted to hold some property to a greater degree than does another individual, as exemplified in (1):

(1) a. Kim is *wiser* than Sandy.
b. Sandy is *taller* than Kim.
c. Kim is *happier* than Sandy.

In English and familiar languages, the canonical expression of such properties is with adjectives, and the formal literature on such properties has therefore unsurprisingly focused nearly exclusively on this particular lexical category (see e.g., Cresswell 1977; Klein 1980; von Stechow 1984; Heim 1985; Kennedy 1997; Barker 2002; Rett 2014; Burnett 2017; among others). There are many lesser studied languages, however, in which the descriptive content expressed by English adjectives is more often lexicalized by nouns or verbs, as discussed extensively in the typological literature (Dixon 1982; Thompson 1989; Hengeveld 1992; Bhat 1994; Wetzer 1996; Stassen 1997; Beck 2002; Baker 2003). Like Thompson (1989), we will henceforth call such words *property concept lexemes*, following terminology in the typological literature which recognizes the fact that lexemes expressing such meanings are not always adjectival. For instance, Hausa (Chadic) has a large set of nouns which are referred to in the descriptive literature as 'abstract nouns of sensory quality' (Parsons 1955), and which appear in possessive constructions in order to express the same kind of meaning that an English adjective does with copular predication:

(2) a. Mun**à** **dà** ƙarfī.
we.CONT with strength
'We are strong.' Newman (2000: 224)
b. Yārinyà tan**à** **dà** zōbè.
girl she.CONT with ring
'The girl has a ring.' Newman (2000: 222)

Such expressions have the same meaning as sentences in familiar languages with adjectival predicates, but the component parts are quite obviously different, and it is an open question how the meanings of nominal property concept lexemes (as common in Hausa) are related to adjectival ones (as common in English). This question becomes more pressing when one realizes that there are paraphrases internal to some languages using both patterns:

(3) a. Kim is wise.
b. Kim has wisdom.

On standard theories, (3a) has truth conditions that make reference to degrees (or something along those lines). There is much less work on expressions such as (3b), and although it has been assumed by some (Menon & Pancheva 2014) that sentences like (3a) and (3b) should have an identical meaning, no empirical arguments have been given, and it thus remains an outstanding question.

While hinting at what the precise meanings of (3a) and (3b) are, we will lay out an argument drawing on data from degree modification, degree questions, subcomparatives, and subequatives in English and Basaá (Bantu; Cameroon) that they must be the same, and, crucially, that this identity of meaning is *model-theoretic* in nature. Importantly, these arguments hold independently of the kind of semantics one assumes for the constructions.

The structure of this papers is as follows. Section 2 introduces possible alternatives to model-theoretic identity. Section 3 addresses differences in meaning between adjectives and pc nominals. Section 4 gives background on property concepts in Basáa. Section 5 proposes a unified analysis of adjectives and possessed pc nominals, which is corroborated by further data in Section 6. Section 7 addresses outstanding issues and concludes.

2 Translational equivalence and variation

In the context of pairs of sentences like those in (3), Francez & Koontz-Garboden (2017) consider what it means to 'mean the same thing', suggesting that, minimally, this notion requires truth-conditional identity (and possibly more; see Keenan 1978). But what does this mean for the compositional nature of these pairs?

It is often taken for granted that identity of truth conditions means model-theoretic identity. This seems unlikely to be true in the general case, however. That is to say, as Francez & Koontz-Garboden (2017: Chapter 1) argue, just because two sentences have the same truth conditions does *not* mean that their meaning is model-theoretically identical, i.e., that they restrict truth conditions in an identical model-theoretic fashion. For instance, in Ulwa (Misumalpan; Nicaragua), as illustrated by (4a), some human propensities are attributed to some body part of an individual (specifically the heart/liver) rather than directly to an individual: a kind of pattern found found crosslinguistically and called 'psychollocation' in the typological literature (Matisoff 1986; Bickel 2004: 86-87). This contrasts with the English mode of expressing the same proposition in (4b).

(4) a. Kim asung baraska.
Kim liver.3sg black
'Kim is evil.'

b. Kim is evil.

As far as we are aware, (4a) and (4b) are true in the same situations. Yet, the ways in which the sentences restrict models are not obviously the same; certainly the component parts have very different meanings, making it unclear whether the two should be assumed to restrict models in precisely the same way.[1] Although it is true that one way of having the same meaning is through model-theoretical identity, the above suggests that there are other ways that two sentences can have the same truth conditions, i.e., of getting people to agree on truth-conditional judgements in the same situations, without necessitating model-theoretic identity.

The situation is the same for expressions of certain property concepts by means of distinct predication strategies, as Francez & Koontz-Garboden (2017: 5–7) point out by comparison of the English and Spanish data in (5-6):

(5) a. I am hungry.

b. Tengo hambre.
have.1SG hunger
'I am hungry.'

(6) a. Kim is tired.

b. Kim tiene sueño.
Kim have.3SG sleep
'Kim is tired.'

The pairs of sentences in (5) and (6) have the same kind of meaning (i.e., Spanish and English speakers will judge them to be 'true' or 'false' in the same situations), but the question remains whether this is model-theoretically encoded. What would that entail for the meanings of adjectives/property concept nouns? In the next section we begin to explore this question by reviewing proposals for the meanings of adjectives and property concept nouns, focusing primarily on recent proposals for the latter put forward in Francez and Koontz-Garboden (2017).

3 The meanings of adjectives and PC nominals

A widely accepted theory of the semantics of adjectives is that they denote relations between individuals and degrees on a scale (Cresswell 1977; von Stechow 1984; Heim 1985; Kennedy 2007 among others), as e.g., for *tall*:

(7) $[\![\text{tall}]\!] = \lambda d \lambda x.x \textit{ is } d\textit{-tall}$

1 Francez & Koontz-Garboden (2017: 4) draw this same conclusion through consideration of the different ways in which a person's age is questioned crosslinguistically.

The degree argument is manipulated by degree morphology and morphosyntactic elements like measure phrases, comparative morphology, and the positive degree operator in order to yield the right truth conditions in the various constructions.

Francez & Koontz-Garboden (2017) argue that property concept nouns such as *hambre* 'hunger', *wisdom*, etc., on the other hand, differ from adjectives in that they denote *qualities*, where these are conceived of as sets of portions (a particular sort of individual), structured like masses as described by Link (1983) (see Francez and Koontz-Garboden 2015 for how these relate to Moltmann's 2009 tropes). They are therefore mereologically ordered. Additionally, however, they are ordered by a size relation, which accounts for the gradability of expressions in which quality-denoting nouns appear.[2] Qualities can then be related to ordinary individuals by a relation π, expressed cross-linguistically with possessive morphosyntax.

(8) **Quality possession**:
For any individual a and quality Q, a has Q iff $\exists p[p \in Q \ \& \ \pi(a,p)]$

This setup makes compositional sense of possessive-predicating property concept sentences: a quality portion must be possessed by some individual. On this analysis, the meaning of a sentence like (9) is then composed as in (10):[3]

(9) Kim has wisdom.

(10) a. $[\![\text{wisdom}]\!] = \lambda p.\mathbf{wisdom}'(p)$
b. $[\![\text{have}]\!] = \lambda P_{\langle pt \rangle} \lambda x \exists p[P(p) \ \& \ \pi(x,p)]$
c. $\exists p[\mathbf{wisdom}'(p) \ \& \ \pi(\text{Kim},p)]$

An alternative to this view is that such nouns denote *scales* – ordered sets of degrees of the kind that adjectives are generally believed to relate individuals to. As Francez & Koontz-Garboden (2015: 553) argue, there is only one substantive difference between scales and qualities: Scales are *ordered*, while qualities are *pre-ordered*. While the former ordering relation is antisymmetric, the latter is not, meaning that while two distinct portions of a quality can occupy the same position in the ordering without being the same portion, such is not the case for degrees/scales. This is a subtle difference, but one which Francez & Koontz-Garboden (2017: 54–55) lay out empirical arguments for suggesting that qualities rather than scales are indeed the right denotation for PC nominals that require possession in predication.

Unlike what is often assumed for adjectives, then, property concept nominals arguably do not have a degree semantics. Yet, possessive sentences based on them

2 See Francez & Koontz-Garboden (2017: Chapter 3) for formal details.

3 The context sensitivity of possessive predications like (9) is a consequence of contextual domain restriction of the existential quantification, and of the independently motivated size-ordering on qualities needed to capture gradability.

seem to have meanings identical to sentences with predicative adjectives. How to reconcile these facts? One possibility is that adjectival and nominal property concept sentences have meanings which, when composed with relevant material, can give rise to truth-conditionally identical meanings, but in model-theoretically different ways. I.e., the two different restrictions on models give rise to identical judgements of truth in the same situations, much like the situation described for (4a) and (4b).

An alternative is that adjectives denote what any *have*+pc noun construction denotes. Menon & Pancheva (2014), for instance, suggest that adjectives in familiar languages have meanings identical to the meanings of the have+pc noun constituent in nominal property concept sentences.[4] In order to tease these two options apart, we present in the following section data concerning degree modification, degree question formation, and subcomparatives/equatives from Basaá, a Bantu language of Cameroon (see Hyman 2003 for an overview). Evaluating these data in Section 5 leads to an endorsement of this second option.

4 Background on Basaá property concept words

Modification and predication in Basaá pick out three classes of property concept words, as discussed by Jenks, Koontz-Garboden & Makasso (2018) (building on Hyman, Jenks & Makasso 2013). Here, we consider only two of the classes, leaving what Jenks et al. (2018) call "adjectival nouns" (which semantically pattern just like adjectives) largely out of the discussion. In modification, *quality nouns* are subordinated to the noun they modify by a connective particle (11), so that they are the complement of the head they modify. This can be seen through differences in noun class agreement on the connective particle (which agrees with the head noun in class) as well as in word order.

(11) hí-nùní hí ŋgùy
19-bird 19.PRT 9.strength
'strong bird' quality noun; Jenks et al. (2018: 651)

True adjectives can directly modify nouns in a post-nominal attributive position, agreeing with the noun in noun class and number (12):

(12) hì-nùní hì-kɛ́ŋí
19-bird 19-big
'big bird' adjective; Jenks et al. (2018: 649)

4 In fact, they go much farther, suggesting that they are syntactically identical as well. Here, we focus only on the semantic part of their claim. See Francez & Koontz-Garboden (2017: 61–72) for a refutation of the syntactic part, at least in the general case.

In predication, adjectives trigger use of the copula *ɓá* (13), which is used with other ordinary non-verbal predicates in the language like nominals and locatives (14).[5]

(13) hí-nuní híí hí yé hi-kɛ́ŋí
19-bird 19.that 19.SUB be 19-big
'That bird is big.' Jenks et al. (2018: 650)

(14) a. Victor a ye m-alêt
Victor 1.AGR be 1-teacher
'Victor is a teacher.' Jenks et al. (2018: 650)

b. hí-nuní híí hí yé í kedé ǃɛ́
19-bird 19.that 19.AGR be LOC inside tree
'That bird is inside the tree.' (e.g. in a hole) Jenks et al. (2018: 650)

Quality nouns, by contrast, require possessive morphosyntax in order to achieve the same meaning achieved with adjectival predication in English.

(15) à gwɛ̀ɛ́ mà-sɔ́dá
1.AGR have 6-strength
'(S)he is strong.'

5 The model-theoretic identity of adjectives and *have*+pc nominals

In this section we show that the Basaá degree modifier *ŋgandak* 'very' treats adjectives and the *have*+pc nominal constituent identically, arguing that the most straightforward analysis of these facts presupposes type-theoretic identity in the denotations of Basaá adjectives and *have*+pc nominal VPs.

5.1 ŋ*gandak*-modification in Basaá

Degree modification in English treats adjectives and nouns, including PC nominals, differently from one another: Nouns require *much*-support (16), while adjectives do not (at least overtly) (17):

(16) Kim has **very much** wisdom.

(17) Kim is **very** tall.

Whether this is due to the morphosyntactic properties of comparatives, as Bresnan (1973) and subsequent syntactic work claims, or is a consequence of semantic

5 This verb undergoes allomorphy depending on noun class.

differences between nouns and adjectives, as Bochnak (2015: 37–40) hints at, is open to debate. What *is* clear is that the contrast is not universal, as it fails to materialize in Basaá: the gradable modifier *ŋgandak* 'very' – which has the syntax of a VP adverbial – modifies both predicative adjective VPs and *have*+pc nominal VPs in an identical fashion, as shown in (18):[6]

(18) a. hí-nuní híí hí [yé hi-kɛ́ŋí **ŋgandak**].
19-bird 19.that 19.SUB be 19-big very
'That bird is big.' adjective

b. kim a [gweé ŋguy **ŋgandak**]
kim AGR has strength very
'Kim is very strong.' quality noun

While we have not conducted all the tests in Beltrama & Bochnak (2015), there are two pieces of crucial evidence that *ŋgandak* is a true gradable modifier. First, as shown in (19), it is not able to modify *have*+ ordinary mass noun VPs, suggesting lexical gradability is required for its use.

(19) *í !ɓɛ́ɛ́ î í gwé!é moó **ŋgandak**
DEM well DEM AGR has oil very
Intended: ∼ 'The well has very much oil.'

This conclusion is supported by the fact that the language makes use of an independent modifier meaning 'really' that can apply to non-gradable predicates, as shown in (20). The modifier *ŋgandak* is not available in these contexts.

(20) hì-nùní yágá/#ŋgandak hî.
19-bird really/very 19.that
'That really is a bird.'

While the source of the difference between English adjectival and nominal intensification might plausibly be syntactic or semantic, identical morphosyntactic treatment like that seen in Basaá entails semantic – specifically model-theoretic – equivalence. That is to say, a uniform lexical semantics of *ŋgandak* will only be available if *ŋgandak* composes with constituents whose denotations are type-theoretically identical. Looking at the same issue slightly differently, for *ŋgandak* to compose with both adjectives and the *have*+pc nominal in what looks like the same morphological and syntactic way, while having different denotations, does not seem plausible. Instead, the null hypothesis in the face of facts like these favors a

6 It also treats the third class—adjectival nouns—in the same way.

lexical semantics for *ŋgandak*, adjectives, and the *have*+pc nominal construct that would allow *ŋgandak* to compose with the former and the latter in an identical way, consistent with the morphosyntax we see on the surface.

5.2 Composition of ŋg*andak*-modification

A unified analysis of the semantics of *ŋgandak* modification is possible if both adjectives and *have*+pc nominal VPs have denotations with the same semantic type, and relate individuals to portions of qualities.[7] We follow Francez and Koontz-Garboden (2017: 44-45) in treating nouns like *ŋguy* 'strength' as denoting qualities, as in (21) (with bold metalanguage predicates having the type of qualities, and p ranging over portions).

(21) $[\![\textit{ŋguy}]\!]$: $\lambda p.\textbf{strength}(p)$ 'strength'

The verb *gweé* 'have' then takes a quality as an argument and returns a relation between individuals and left-bounded intervals of a quality (i), i.e., subsets of that quality that contain those portions at or above a cut off point in the size-ordering defined to mark the point in the ordering above which all portions 'stand out' contextually (in the sense of Kennedy 2007).[8] The result of *gwee* composing with a noun such as *ŋguy* is shown in (22).

(22) $[\![\textit{gweé ŋguy}]\!]$: $\lambda x \lambda i \subset \textbf{strength}.\exists^{i} z[\pi(x,z)]$ 'have strength'

In this way, e.g., *Kim à gweé ŋguy* 'Kim is strong' is true iff Kim's portion of strength is in such an interval, thereby capturing the context-sensitivity of positive degree constructions (see Francez & Koontz-Garboden 2017: 47ff. for extension to the comparative).

Crucially, we propose that adjectives such as *ŋkéŋí* 'big' have precisely the same kind of denotation as VPs like *gweé ŋguy*, varying only in the quality possessed, as shown in (23).

(23) $[\![\textit{ŋkéŋí}]\!]$: $\lambda x \lambda i \subset \textbf{bigness}.\exists^{i} z[\pi(x,z)]$

The denotation for *ŋgandak* as in (24) is then able to modify both in precisely the same way, taking the *have*+pc nominal VP or the *be*+adjective VP (where *be* denotes the identity function on predicates) as an argument in sentences like (18).

7 A unified analysis would also be possible if adjectives and the *have*+pc nominal VP denote degree relations, with the degree relation created from a scale-denoting noun and *have* taking a scale and creating a degree relation. Accepting the arguments in Francez & Koontz-Garboden (2017: 54–5) that a scale-denotation is less well-supported for quality nouns than a quality one, however, we believe the analysis sketched above is preferable.

8 On why the interval must be left-bounded, see Francez & Koontz-Garboden (2017: 44–46).

(24) [[ŋgandak]]: $\lambda Q_{(e,(i,t))}\lambda x.\exists^{i}z[Q(x)(i) \wedge VERY(\lambda i'\exists x'[Q(x')(i')]) = i]$

It does this, as in (25), by restricting the interval in which an individual's quality portion can be found to just those portions in an interval returned by the context-sensitive function VERY, a function which takes a set of intervals as an argument and returns the left-bounded interval, in which can be found only those portions that stand out in a set of portions that themselves stand out (in the spirit of the treatment of *very* in Wheeler 1972; Klein 1980; von Stechow 1984), i.e., an interval with a contextually very high lowest portion.

(25) a. [[*yé hikéŋí ŋgandak*]]: 'be very big'
$\lambda x.\exists^{i\subset\textbf{bigness}}z[\pi(x,z) \wedge VERY(\lambda i'\exists x'\exists^{i'\subset\textbf{bigness}}z'[\pi(x',z')]) = i]$

b. [[*gweé ŋguy ŋgandak*]]: 'have much strength'
$\lambda x.\exists^{i\subset\textbf{strength}}z[\pi(x,z) \wedge VERY(\lambda i'\exists x'\exists^{i'\subset\textbf{strength}}z'[\pi(x',z')]) = i]$

6 Supporting evidence

The proposed analysis makes the prediction that other constructions involving gradability should likewise treat adjectives and the *have*+pc noun VP identically. We show in this section that this prediction is borne out: the two types show the same behavior in degree questions, subcomparatives, and subequatives.

6.1 Degree questions

The first piece of additional evidence for the model-theoretic equivalence of adjectives and *have*+pc nominal VPs comes from degree questions. On a par with intensification contexts, degree question formation in English likewise invokes *much*-support in the case of nominals:

(26) **How much wisdom** does Kim have?

(27) **How tall** is Sandy?

Just as was the case with *ŋgandak*-modification however, degree questions in Basaá are formed identically across property concept type, without anything like the intervention of *much*:

(28) kim a ye ŋkéŋí **kií** **!kíí**?
kim AGR be big how what
'How big is Kim?' adjective

(29) kim gweé ŋguy **kií** **!kíí**?
kim has strength how what
'How strong is Kim?' have+pc noun

The same logic applies here as for *ŋgandak*-modification: the type of both adjectives and *have*+pc nominal VPs should be the same in order for degree questions to target their meanings in the same way. These facts can then be straightforwardly accounted for under a standard semantic theory of degree questions (e.g., Rullmann 1995) if the *wh*-operator 'how' simply binds a variable ranging over portions (rather than over degrees).

6.2 Argument 2: Subcomparatives

The second piece of additional evidence comes from comparative subdeletion, which, in the words of Kennedy (1997: 45), is a construction "of the form *x is more A1 than A2*, where *A1* and *A2* are lexically distinct." The example in (30) illustrates the construction for English.

(30) The desk is higher than the door is wide.

Comparative subdeletion is taken as indicative of quantification over degree-like objects (see e.g., von Stechow 1984: 50). Heim (1985: 4) for example treats the translation of (30) as (31) (where x and y range over degrees).

(31) $\exists y[y > \iota x[\text{the door is } x\text{-wide}] \ \&\ [\text{the desk is } y\text{-high}]]$

The intuition about (30), captured by (31), is that a comparative subdeletion construction compares the degree to which one entity has some property $P1$ to the degree that it (or another entity) has a different property $P2$.

6.2.1 English mixed subcomparatives

Comparative subdeletion gives us a potential test for probing the model-theoretic identity (or lack thereof) of adjectival and nominal property concept sentences. If *have*+pc nominal and adjectival predications have meanings that are model-theoretically identical, then they should in principle be mixable in subcomparative constructions (provided that they do not give rise to incommensurability – Kennedy 1997: 43ff.), in the same way that adjectives can be. In English however, it is a robust judgement that they are not acceptable, as shown in the examples below.

(32) a. Conference room A has more width than it has length.
b. Conference room A is wider than it is long.

c. * Conference room A has more width than it is long.

d. * Conference room A is wider than it has length.

While this is certainly explainable by a lack of model-theoretic identity, the idea being that the $>$ relation in the translation of a subcomparative (e.g., (31)) will only be defined between objects of the same (and right) semantic types, it is also possible that there is a syntactic infelicity. I.e., mixed subcomparatives could be unacceptable in any language, English included, for semantic *or* syntactic reasons.

In English, independent of what's going on semantically, there is reason to believe that their syntax does violate a constraint on the syntax of comparatives. Bresnan (1973: 310) argues that a range of phenomena are explained by the idea that "something in the [comparative] clause is always deleted under "identity with" (nondistinctness from) the head."

(33) [The table is longer]$_{head}$ than the door is wide.

The clause deleted is syntactically identical (in function, constituency, features, lexical content) to a clause in the head. Whatever the syntax of a PC nominal clause (which for Bresnan (1973) is a partitive), a few things are clear, at least on the view that adjectives have a degree semantics, while nouns and verbs do not (see Cresswell 1977 for a different view). First, *much* with nouns and verbs (introduces a degree semantics which) makes comparison semantically possible. Second, the orthodox view of adjectives is that they lexically have a degree semantics, and to the extent there is a *much* (something often notably absent in semantic analyses—see Bochnak 2015 for arguments in favor of its absence) that appears with them in gradable constructions it is: i) deleted whenever it is next to the adjective (cf. Bresnan 1973); ii) has a different semantics to nominal and verbal *much* (given that with these, it is responsible for introducing degrees, by contrast with adjectives); and iii) syntactically different, minimally in that the constituent that it modifies is of a different category (noun, verb, adjective).

Based on these considerations, nearly independent of analytical particulars, it is clear that mixed subcomparatives like (34) violate Bresnan's identity constraint:

(34) * The table has more width than it is long.

In the case of (34), either there is no *much* with adjectives, in which case there is clearly no matching, since nouns do clearly have one, or there *is* a covert *much* with adjectives, but it is different to the *much* appearing with nouns in comparatives. Either way, the identity constraint is violated, and mixed subcomparatives are predicted to be ungrammatical, as is indeed the case.[9]

9 Alternatively, on an analysis like Wellwood's (2015), in which *much* uniformly introduces degrees with adjectives and nouns, it might simply be the difference in category of the PC lexeme in each clause that triggers violation of the matching constraint.

In short, the *much* (embedded by hypothesis in *more*, under the view that it derives from *–er much*) that is deleted low must be identical to the one upstairs. This is not the case in mixed subcomparatives on most views (the exception being Wellwood's 2015 (on which see footnote 9), explaining their unacceptability in English. If this syntactic identity constraint is English-specific, however, then it might be possible still to find mixed subcomparatives in some other language, with the right mix of property concept lexemes, to probe their lexical semantics.

6.2.2 Basaá mixed subcomparatives

Comparative subdeletion is licit in Basaá, as illustrated by the data in (35), which compares the degree to which Kim has two different properties, both of which are introduced by adjectives (here, the *kíí* seems to mark clausal comparison).

(35) iní !ndáp i ye **i-kɛŋ́** lɔɔ kií i ye **i-láám**
this 9.house SM be.PR 9-big pass as SM be.pr 9-beautiful
'That building is more big than it is beautiful.'

As (36) shows moreover, it is also possible when both properties are introduced by quality nouns.

(36) Kim a **gweé masɔ́dá** lɔɔ kií a **gweé ŋguy**.
Kim AGR have luck pass as he has strength
'Kim has more luck than he has strength.'

However, while English adjectives and *have*+pc nominal VPs cannot be mixed in comparative subdeletion as shown by (32c) and (32d), these two classes can be freely mixed in cases of comparative subdeletion in Basaá:[10]

(37) kim a ye **ŋkɛŋ́** lɔɔ kií a **gwee ŋguy**.
kim AGR is big pass as he has strength
'Kim is bigger than he is strong (=has strength).' adjective & quality noun

By contrast with English, then, Basaá does allow mixed subcomparatives, syntactically speaking. The obvious (possibly naive) conclusions to draw from these data are as follows. First, the syntax of Basaá comparatives is not constrained by the

10 The third class of property concept lexeme—adjectival noun—can also be mixed with quality nouns:

(i) kim a ye **ŋkɛŋ́** lɔɔ kií a ye **nláám**.
kim AGR is big pass as he be beautiful
'Kim is bigger than he is beautiful.' adjective & adjectival noun

identity condition that English is. Second, mixed subcomparatives require a lexical semantics for quality nouns and adjectives that is built on a common model-theoretic core. They are acceptable in Basaá and must therefore share this core, since comparison between the entities on the scale/in the quality/etc. would not otherwise be defined semantically. Third, this core could, in principle, be degree-based *or* portion-based, depending on one's world view, or something else entirely, so long as there is a common model-theoretic core that can be compared (two degrees, two portions, etc.).

6.3 Argument 3: Equatives

The same kind of argument drawn from subcomparatives can also be drawn from equatives. In English, adjectives and *have*+pc nominal VPs cannot be mixed (38c):

(38) a. This room is as wide as that one is long.
b. This room has as much width as that one has length.
c. * This room has as much width as that one is long.

With Basaá equatives, however, adjectives and *have*+pc nominal VPs *can* be mixed:

(39) iní !ndáp i ye **kéŋí** nlelem kií i **gweé ŋguy**.
DEM house AGR is big same as it has strength
'The house is as big as it is strong (=has strength).' adjective & quality noun

The same logic applied to subcomparatives applies here—were the adjective and the *have*+PC nominal VP not of the same type, the identity of degree would not be defined. Given that the construction is acceptable, it must be, and the two of the same type, therefore.

6.4 Complications

The comparative (and probably equative) arguments rest on the assumption that the mixed subcomparatives are ordinary degree comparatives, with the associated kind of semantics. We want to point out the possibility, however, that the mixed subcomparatives are not comparatives of this kind, but are rather metalinguistic (Giannakidou & Yoon 2011; Morzycki 2011, and citations there), a kind of comparative that could easily be confused with subcomparatives. Such comparatives are said to compare something like degrees of truth, loosely speaking, and have a range of properties that distinguish them from ordinary comparatives, at least in English. As a consequence, they allow a much wider range of predicates to be compared. Most notably, they are acceptable with non-gradable predicates:

(40) a. Clarence is more a syntactician than a semanticist.
b. I am more machine than man. Morzycki (2011: 40)

They are also found, however, with gradable predicates, and have been claimed to be identifiable in English most clearly by different morphosyntactic properties. For example, they allow an adjective in the standard phrase, but disallow the synthetic comparative morpheme *-er*.

(41) a. George is more dumb than crazy.
b. * George is dumber than crazy.

Such comparatives, whatever semantics they have, do not have a semantics that compares some degree/portion on a scale (introduced by the target phrase) to another degree/portion on another scale (introduced by the predicate in the standard phrase). If the Basaá mixed subcomparatives turned out to be metalinguistic, we could conclude very little about the lexical semantics of the property concept words in the target or standard from them, since metalinguistic comparatives do not obviously compare degrees/portions introduced by such predicates, but compare entirely different objects. The subcomparative and equative data alone, therefore, do not make the argument that adjectives and *have*+pc nominal VPs have the same type of denotation. Taken with the arguments from *ŋgandak* and degree questions which do not suffer from this potential confound, though, we believe these are supporting circumstantial arguments and that the overall argument is convincing.

7 Outstanding issues and concluding remarks

A unified analysis of the semantics of *ŋgandak* modification, degree question formation, (sub)comparison, and equatives are all possible if Basaá adjectives and *have*+pc nominal VPs have the same semantic type. Whether this is as degree relations (as in Cresswell 1976 and others) or as sets of individuals possessing some portion of a quality (introduced by the PC nominal in the *have*+pc nominal construction), the idea is that: (i) *ŋgandak* restricts the compared degree or portion to be high in the scale/ordering of portions; (ii) *kií !kíí* questions a degree or portion; (iii) subcomparison introduces an ordering between degrees or portions; and (iv) (sub)equatives require equality of degrees/portions.

While we believe there are (subtle) arguments to favor the quality analysis (see Francez & Koontz-Garboden 2017: Chapter 6), our point here is simply that, whichever the right approach, Basaá shows that the adjective and the *have*+pc noun VP must be identical in semantic type, much as suggested by Menon and Pancheva's (2014) syntactic analysis (which we nevertheless do not subscribe to—see Francez & Koontz-Garboden 2017: Chapter 4 for problems). More broadly, we believe the null

hypothesis should be that the result applies crosslinguistically, at least to languages that behave as having a positive setting on the degree semantic parameter (Beck, Krasikova, Fleischer, Gergel, Hofstetter, Savelsberg, Vandereist & Villalta 2010; Bochnak 2015). As can be seen clearly from English, language-specific syntax can obscure this fact. *Much*-support means that degree modification and degree questions treat adjectives and *have*+pc noun VPs differently, for what some ultimately treat as morphophonological reasons. Subcomparatives and equatives cannot be mixed for reasons that are plausibly syntactic. This state of affairs allows, therefore, that the semantic result does apply to Enlish, as initially argued by Menon & Pancheva (2014), even if its syntax and morphophonology prevent us from actually seeing it.

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