Decomposing Adjectival Meaning in Navajo

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Abstract The standard model of adjectival meaning treats adjectives as scalar, two-place relations between degrees and individuals of type \(<\text{det}>\). While this model may be sufficient for languages like English, in other languages the type \(<\text{det}>\) meaning is the marked option, both morphologically and distributionally. I demonstrate that in Navajo (Na-Dene, Athabaskan), the scalar (type \(<\text{det}>\)) meaning is only available for a subset of adjectival verbs. All other adjectival verbs are vague predicates (type \(<\text{et}>\)). Both scalar and vague predicate meanings are licensed by derivational morphemes. I argue that Navajo presents strong empirical support not only against the standard model, but also in favor of the decompositional model (Kennedy, Projecting the adjective: The syntax and semantics of gradability and comparison, 1999), where both the scalar and vague predicate meanings are derived from a more basic unit of adjectival meaning, a measure function. The proposal is supported by data from morphology, syntax, and semantics. The analysis is extended to Russian, where scalar meaning is also restricted to adjectives bearing particular morphology. The data from Navajo and Russian raise interesting questions concerning the semantics of POS-marked adjectives and the adverbial degree expressions that modify them.

Keywords Adjectives · Degree · Comparison · Navajo · Na-Dene

1 Introduction

This paper discusses the semantics of the varieties of adjectival verbs in Navajo represented in (1).\(^1\)

(1)     a. 'áníhlnééz
        'I am tall (in a relative or comparative sense)'
   b. nisneez
        'I am tall (in an absolute sense)'
   c. deesdoi
        'It is hot'

Based on data from the morphology, syntax, and semantics of these adjectival verbs and degree constructions in which they are used, I argue that Navajo adjectival verbs like (1a) are two-place, scalar relations between individuals and degrees (type \(<\text{det}>\)) while the forms in (1b) and (1c) are vague predicates (type \(<\text{et}>\)). The scalar and vague predicate meanings are derived from a basic morphological unit: the verb stem. Additional morphology converts the stem into either a scalar expression or a vague predicate. Drawing on work by Krasikova (2009), I argue that a similar pattern is found in Russian, where scalar meaning is also restricted to adjectives bearing particular morphology. The proposal is supported by data from morphology, syntax, and semantics. The analysis is extended to Russian, where scalar meaning is also restricted to adjectives bearing particular morphology. The data from Navajo and Russian raise interesting questions concerning the semantics of POS-marked adjectives and the adverbial degree expressions that modify them.

The goals of this paper are twofold. It provides a detailed account of Navajo adjectival verbs, an underdescribed area of the grammar that has not received previous theoretical attention. In addition, it contributes a new typological

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1 Apart from the tendency of adjectival verbs to be morphologically simpler than action-denoting verbs, there is no strong evidence for a lexical split between predicative 'adjectives' and 'verbs' in Navajo. I use the term 'adjectival verb' throughout the paper.
perspective on two overarching questions in the literature on the semantics of adjectives and degree constructions (e.g., comparative, equative, interrogative, and measure phrase constructions). First, do all adjectives have the same semantics at the point at which they are used in degree constructions? The frequently adopted ‘standard’ model of adjectival meaning takes all adjectives to be scalar, type <det> expressions when they are available for use in degree constructions (Cresswell 1976, Seuren 1978, von Stechow 1984, Kennedy and McNally 2005, among others). I argue that only a subset of Navajo adjectival verbs have a scalar meaning at this point in the derivation. The majority of adjectival verbs have a vague predicate meaning.

Second, if not all adjectives bear an open degree argument when they are used in degree constructions, should they be born in the lexicon as type <det> expressions? In Navajo, both scalar and vague predicate meanings are licensed by additional morphology marking adjectival verb stems. Adjectival verb stems, like all verb stems in the language, cannot be used predicatively if not marked by derivational morphology. It is theoretically possible to argue that verb stems are type <det> expressions, as discussed in Schwarzschild (2010). However, the narrow distribution of adjectival verbs with <det> meaning and their greater degree of morphological markedness suggests that this account is not ideal. Following Kennedy (1999), I argue that the most basic unit of adjectival meaning is a type <ed> measure function. This abstract unit is overtly realized in Navajo as the verb stem. As in Kennedy’s proposal, both scalar and vague predicate meanings are derived through composition of the measure function with degree morphology.

The proposal for Navajo contributes to work on variation in the cross-linguistic semantics of adjectives and degree constructions, as in Beck, Oda, and Sugisaki (2004), Kennedy (2007b), and especially Beck et al. (To appear). Beck et al. (To appear) takes the availability of scalar, type <det> adjectives to be parametric. For a given language, adjectives will be either all scalar expressions of type <det> or all vague predicates of type <et>. In contrast with this proposal, I argue that the set of Navajo adjectival verbs contains both vague predicates and scalar expressions. The semantics of a particular adjectival verb is determined by the morphology marking the verb.

The paper is organized as follows. Section 2 summarizes the standard and decompositional models of adjectival meaning and summarizes the analysis that will be developed for Navajo throughout the remainder of the paper. I argue that adjectival verb stems can compose with either CA (‘comparative aspect’) or POS (‘positive’) morphemes. Composition with CA morphology produces a scalar, type <det> expression while composition with POS morphology produces a vague predicate of type <et>. Section 3 summarizes Navajo adjectival morphology and lists the degree constructions in which adjectival verbs can occur. Section 4 presents morphological and syntactic evidence supporting the analysis of CA and POS morphemes. Section 6 reviews the licensing of scalar meaning by CA in Navajo and extends the analysis to Russian, where scalar meaning is licensed by the synthetic comparative morpheme.

Having established the basic differences between CA- and POS-marked adjectival verbs, Section 7 introduces the semantics of POS-marked adjectival verbs used in the comparative and equative constructions. I argue that the POS morpheme in Navajo is basically uninformative but can be - and, under certain conditions, must be - semantically strengthened to include reference to a contextual standard of comparison. With respect to the semantics of POS, the distinction between ‘contrastive’ and ‘noncontrastive’ adjectival verbs becomes relevant. Contrastive verbs have regularly used CA- and POS-marked forms. Noncontrastive verbs are only (or, primarily) found marked by POS. Section 8 concludes.

2 Two Approaches to Adjectival Meaning

The standard model of adjectival meaning takes gradable adjectives (tall, pretty, short, green) to be relations between degrees and properties of individuals. The version of the standard model that I assume is closest to Heim (2000), whose proposal draws from Cresswell (1976) and Seuren (1978). Among the authors who adopt the standard model are Cresswell (1976), Seuren (1978), von Stechow (1984), Rullmann (1995), Heim (2000), Schwarzschild (2005), and Kennedy and McNally (2005). Under the standard model adopted by Heim (2000), adjectives are transitive expressions with denotations of the form in (2). The degree argument (of semantic type d) is the inner argument and the subject is the external argument. The degree argument is valued by a degree expression. Some degree expressions (measure phrases, deictic that-phrases) are of type d and can be interpreted in situ, saturating the degree argument directly, as in (3). Other degree expressions, such as those headed by -er, as, and too, are generalized quantifiers over degrees (type <dt,d>), and value the degree argument through restriction, as in (4).2 I will refer to arguments in the position of ‘Sandy’ as the ‘topic of comparison.’ Arguments in the position of ‘Jane’ will be referred to as the ‘standard of comparison.’

2 Von Stechow (2009) takes measure phrases also to be quantificational type <dt,d> expressions. I abstract away from this variation but this assumption could be imported straightforwardly into the proposal developed here.

(2) [tall] = λx,d.λx.e. x is tall to degree d

(3) a. Sandy is 5ft tall.
   b. [tall](5ft)(Sandy)

(4) a. Sandy is more beautiful than Jane.
b. \([\text{MORE}] = \lambda Q_{dt} \cdot \lambda P_{dt}. \text{MAX}(P) > \text{MAX}(Q)\)

c. \(\text{max}(\lambda d. \text{Sandy} \ d\text{-beautiful}) > \text{max}(\lambda d. \text{Jane} \ d\text{-beautiful})\)

The ‘unmarked’ form of the adjective found in the ‘positive’ construction in (5a) is derived through composition of an adjective with the covert morpheme POS, (5b). When an adjective is POS-marked, the topic of comparison exhibits the property denoted by the adjective to a degree exceeding the contextual standard of comparison, c. Throughout the paper, I use the term ‘norm-related’ to describe this property of POS-marked adjectives.

(5) a. Sandy is tall.

b. \([\text{POS}]^c = \lambda g_{ed} \lambda x \exists d. P(x, d) \land d > c\)

(Adapted from Rett (2008) and Cresswell (1976))

Adjectives like (2) pick out an individual-degree pair. It is not immediately obvious how individuals and degrees can be related. Making explicit earlier proposals by Cresswell (1976), von Stechow (1984) and Kennedy (1999) assume that adjectives in fact relate two degrees. The denotation of an adjective contains a measure function of type <ed>. The measure function applies to the subject and projects a degree corresponding to the subject’s height onto a scale of tallness. The ordering relation \(\geq\) relates the degree produced by the measure function to the degree argument \(d\).

(6) \([\text{tall}] = \lambda d_d. \lambda x_e. \delta_{\text{tall}}(x) \geq d\)

(7) a. \([\text{tall}]\text{(5ft)}\text{(Sandy)}\)

b. \(\delta_{\text{tall}}\text{(Sandy)} \geq 5\text{ft}\)

c. The degree on a scale of tallness produced by applying \(\delta_{\text{tall}}\) to \text{Sandy} is at least as great as 5ft.

Kennedy (1999) developed the decompositional model of adjectival meaning as an alternative to the standard model. The meaning in (6) is not basic in the decompositional model. Rather, the basic unit of adjectival meaning is a measure function, as in (8a). Degree morphology converts the measure function into an expression of type <det> or <et>. As in the standard model, the non-overtly marked form of the adjective used in the positive construction is derived through composition with the covert morpheme POS, (8b). The denotation of POS is from Kennedy (2007). Svenonius and Kennedy (2006) posit the morpheme MEAS, (8c). MEAS is used in the measure phrase construction and composes with a measure function to form a type <det> expression with the same denotation as adjectives under the standard model. The decompositional model also posits other degree morphemes, including MORE, (8d), but the morphemes POS and MEAS will be most crucial to the analysis of Navajo.

(8) a. \([\text{tall}] = \lambda x. \delta_{\text{tall}}(x)\)

b. \([\text{POS}]^c = \lambda g_{ed} \lambda x. g(x) > c\)

c. \([\text{MEAS}] = \lambda g_{ed} \lambda x. g(x) \geq d\)

d. \([\text{MORE}] = \lambda g_{ed} \lambda x. g(x) > d\)

2.1 Comparing the Models

The standard and decompositional models are quite similar on a number of levels, even where they initially appear to contrast. For instance, the standard model assumes that most degree expressions are quantificational in nature, where the degree head (e.g., MORE) and the marker of the standard of comparison (e.g., than) form a constituent. By contrast, the decompositional model assumes that the standard of comparison saturates the adjective’s degree argument directly rather than quantifies over it. Kennedy (1999) made this proposal in response to observations that degree expressions do not exhibit behaviors characteristic of other quantificational expressions. However, Heim (2000) argues that Kennedy’s observations do not necessarily rule out a quantificational approach to the semantics of degree constructions.

A more profound contrast between the two models is in their respective views of basic adjectival meaning. Adjectives under both models are abstract semantic objects that relate an individual and a degree along some scale. However, their contrasting assumptions about the form of this abstract object lead to different predictions about the set of possible degree morphemes expected to surface cross-linguistically. Recall that MEAS was necessary only under the decompositional model to derive the scalar, type <det> meaning. A language in which special morphology is necessary to derive this meaning, or where this meaning is not fundamentally available to all adjectives, would be best handled by the decompositional model.
2.2 Introducing Navajo

In this paper, I argue that Navajo is such a language. Scalar, type \(<\text{det}>\) meaning is only licensed for adjectival verbs in the presence of particular morphology, as in (9a). This morphology is referred to in the Athabaskanist literature as ‘comparative aspect’ (henceforth, CA) and is limited to a small subset of all adjectival verbs, as summarized in Kari (1979), Young and Morgan (1987). All other adjectival verbs have a vague, type \(<\text{et}>\) meaning and are marked with either ‘absolute aspect’ (henceforth AA; as in (9b)) or are not overtly marked (as in (9c)). While the forms in (9b) and (9c) are grammatical without further modification, the form in (9a) is a citation form only. CA-marked adjectival verbs must always be modified by a degree expression.

(9) a. \(\text{`áníłnééz}\) `S/he tall (in a relative or comparative sense)'

   b. nisneez
      `I am tall (in an absolute sense)'

   c. deesdoi
      `It is hot'

I argue that the hypothesis in (10) captures both the contrasts in translation and the requirement of CA-marked adjectival verbs to be modified by a degree expression.

(10) a. All adjectival verbs marked for comparative aspect (e.g., (9a)) are transitive, type \(<\text{det}>\) relations between degrees and individuals.

   b. Adjectival verbs not marked for comparative aspect (e.g., (9b), (9c)) are intransitive, vague predicates of type \(<\text{et}>\).

I further argue that all three forms in (9) are morphologically complex expressions that can be decomposed. Following Kennedy (1999), I propose that the basic unit of adjectival meaning in Navajo is a measure function, realized as the verb stem.

(11) \([\text{tall}] = \lambda x. \delta_{\text{tall}}(x)\)

In Navajo, verb stems never appear in their bare form but instead must compose with additional morphology.

This generalization recalls the decompositional model, where measure functions must compose with degree morphemes in order to become predicative expressions. I posit that in Navajo, CA has the semantics of Svenonius and Kennedy’s (2006) MEAS morpheme: CA composes with a measure function to produce a transitive, type \(<\text{det}>\) expression. The denotation of this morphologically complex unit is the same as proposed for all adjectival verbs under the standard model but, in contrast with the standard model, this semantics is only available in the presence of CA.

(12) \([CA] = \lambda g_{\text{et}} \lambda d \lambda x. g(x) \geq d\)

Measure functions can also compose with the ‘positive’ morpheme POS. I assume that all adjectival verbs not marked with CA are POS-marked. This includes both the forms in (9b), where POS is realized as AA morphology, and (9c), where POS is a null morpheme. The most basic function of POS is to convert a measure function into a property of individuals (type \(<\text{et}>\)). POS-marked adjectival verbs are vague predicates that lack a degree argument. In contrast with analyses of POS under both the standard and decompositional analyses, Navajo POS does not always introduce reference to a contextual standard. Based on evidence from the semantics of the comparative and equative constructions discussed in Section 7, I propose that POS can have either denotation in (13). The meaning of POS is restricted to its informative form under certain semantic conditions, also discussed in Section 7.

\(^3\) The only apparent exception is the set of dimension-denoting adjectival verb stems found in highly lexicalized noun+stem compounds, e.g.:

(1) \`éétsoh
   `éé+tsoh shirt+large
   `coat`

Modification of nouns by adjectival verb stems is not a very productive process. Nouns are more frequently modified by adjectival verbs that bear all relevant derivational and inflectional morphology:

(2) \`éétsoh nizhóní léí'
   coat 3S-pretty DET
   `a pretty coat'
Other degree morphemes posited by Kennedy (1999), including MORE and AS, do not compose with adjectival verbs in Navajo. The ordering relations expressed by these degree morphemes in English are, in Navajo, introduced by the morpheme marking the standard of comparison (or, ‘standard marker’).

3 Adjectival Verbs and Degree Constructions in Navajo

3.1 Background on Navajo

Navajo is a member of the Athabaskan branch of the Na-Dene language family and is spoken in the southwest of the United States. Navajo is often claimed to be a Pronominal Argument Language, as in Willie and Jelinek (2000) and Hale (2003). Following this tradition, Faltz (2000) argues that when ‘syntactically visible,’ all arguments of a Navajo verb are saturated, such that all verb-external material is adverbial. CA-marked adjectival verbs are exceptions to the generalization: the degree argument is not saturated by the point at which the verb is syntactically visible, which I equate with the point at which the verb can be used in a degree construction.

Young and Morgan (1987) describe Navajo verbs in terms of a complex templatic structure. Below, I provide a simplified form of the template that includes only those positions relevant to the present discussion. The verb stem at the right edge carries the basic lexical meaning. When not idiosyncratic, the valence marker indicates the number of arguments. In addition to incorporated postpositions, postpositions can also be separated from the verb. The two positions labeled ‘derivational’ contain adverbial morphemes as well as morphemes that are part of larger semantic units, as discussed in Cable (2010).

Table 1 Navajo Adjectival Verb Structure

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>...</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorporated Post-position</td>
<td>Derivational A</td>
<td>...</td>
<td>Derivational B</td>
<td>Aspect</td>
<td>Subject</td>
<td>Valence</td>
<td>Stem</td>
</tr>
</tbody>
</table>

Apart from exceptions noted in footnote 3, verb stems cannot appear without subject marking and at least one derivational morpheme. This required morpheme is in Aspect position for action-denoting verbs while it is located in Derivational B position for adjectival verbs.4

3.2 Background on Degree Constructions

Since this paper considers the semantics of adjectival verbs in the context of degree constructions, we may first summarize the set of possible constructions and their syntax before returning to the distribution of CA and POS morphology in Section 3.3.

The examples in (14) illustrate the basic syntax of the comparative construction using three different adjectival verbs. In all three examples, the topic of comparison is marked with pronominal inflection on the adjectival verb. The standard of comparison is marked with pronominal inflection on the standard marker, the postposition P-lááh ‘beyond P.’

(14) a. Shichídí nihígíí bilááh *(át’eego) nízhóní
1poss-car 2sg-COMP 3O-beyond 3S-be-SUB niPOS-3S-*pos-prettyPOS
‘My car is prettier than yours.’

b. Kééhasti’įgí Phoenix bilááh *(át’eego) deesdoi
1sgS-dwell-COMP Phoenix 3O-beyond 3S-be-SUB 3S-hotPOS
‘It is hotter than Phoenix where I live.’

(Young and Morgan 1987: d85)

c. Shínaáí bilááh *(át’eego) ’áníshdííl
1poss-older.brother 3O-beyond 3S-be-SUB *áCA-níCA-1sgS-áCA-bigCA
‘I’m larger than my older brother.’

4 The terms ‘comparative aspect’ and ‘absolute aspect’ were coined by Kari (1979) to reflect the proximity of these derivational morphemes to true aspectual morphology. At this time, I do not propose a deeper connection between degree morphology and true aspectual morphology.
Table 2 contains the degree expressions used in Navajo degree constructions. Some Navajo degree constructions (equative and greater-than and less-than comparatives) use locative enclitics (Enc) and postpositions (PP) as standard markers. Cross-linguistically, this is a common form for degree constructions to take, as discussed by Stassen (1985). Other degree constructions use prefixes (as in (h) and (i)), modifiers (as in (e)), and wh-words (as in (f)).

<table>
<thead>
<tr>
<th>Navajo</th>
<th>Translation</th>
<th>Full Construction</th>
<th>Type</th>
<th>Can occur with POS-marked?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. P-lááh Adj</td>
<td>beyond P</td>
<td>X is more Adj than P</td>
<td>PP</td>
<td>Yes (+ 'át'éego)</td>
</tr>
<tr>
<td>b. P-'oh Adj</td>
<td>short of P</td>
<td>X is less Adj than P</td>
<td>PP</td>
<td>Yes (+ 'át'éego)</td>
</tr>
<tr>
<td>c. P-ee-Adj</td>
<td>with P</td>
<td>X is as Adj as P</td>
<td>PP</td>
<td>No</td>
</tr>
<tr>
<td>d. NP-gi Adj</td>
<td>at NP</td>
<td>X is Adj as NP</td>
<td>Enc</td>
<td>Yes (+ 'át'éego)</td>
</tr>
<tr>
<td>e. 'ayóo Adj</td>
<td>very</td>
<td>X is very Adj</td>
<td>Adverb</td>
<td>Yes (- 'át'éego)</td>
</tr>
<tr>
<td>f. Haa-Adj</td>
<td>how, why</td>
<td>How Adj is X?</td>
<td>Wh</td>
<td>Yes (+ 'át'éego)</td>
</tr>
<tr>
<td>g. Measure phrase Adj</td>
<td>e.g., 6ft</td>
<td>X is MP Adj</td>
<td>DP</td>
<td>No</td>
</tr>
<tr>
<td>h. doo shó-Adj da</td>
<td>awfully</td>
<td>X is awfully Adj</td>
<td>Prefix</td>
<td>Yes (+ 'át'éego)</td>
</tr>
<tr>
<td>i. ko-Adj</td>
<td>that</td>
<td>X is that Adj</td>
<td>Prefix</td>
<td>No</td>
</tr>
<tr>
<td>j. 'aláahdí Adj</td>
<td>furthermore</td>
<td>X is the most Adj</td>
<td>PP</td>
<td>Yes (- 'át'éego)</td>
</tr>
</tbody>
</table>

Note that while CA-marked adjectival verbs can participate in all degree constructions, the distribution of POS-marked adjectival verbs is more restricted. There are two reasons why a degree construction may be unavailable for a POS-marked adjectival verb. First, as indicated in Table 2, many degree constructions containing POS-marked adjectival verbs require the degree word or phrase to be introduced by the copula 'át'é 'it is'. The entire degree phrase+copula constituent is marked by the subordinator/adverbializer -go. The copula and subordinator surface as 'át'éego, translated by Young and Morgan (1987) as 'it being.' This pattern can be seen in (14a,b). When the adjectival verb is CA-marked, 'át'éego cannot be present. This pattern can be seen in (14c). Given a POS-marked verb, if the degree construction is such that 'át'éego cannot be used (e.g., when the degree construction consists only of a prefix, as in row (i) of Table 2), then the degree construction is unavailable. I discuss the significance of 'át'éego at greater length in Section 4.3.

Second, some constructions (the measure phrase (g), deictic (i), and subcomparative constructions) involve abstraction over a degree argument. Since I argue that only CA-marked adjectival verbs possess a degree argument, these constructions are not available for POS-marked verbs. I discuss these data in Section 5.

3.3 Navajo Adjectival Classes and Morphology

Having introduced the basic syntax of degree constructions in Navajo, we may now consider the distribution and realization of the morphemes CA and POS. The four possible indicators of CA are listed below. Not all indicators are present in all CA-marked adjectival verbs due to morpho-phonological rules and lexical irregularities.

(15) a. Morpheme [ 'á] in Derivational A (absent in particular degree constructions)
    b. Morpheme [ni] in Derivational B
       i. Sometimes ni fails to surface overtly and is instead registered as a vowel with raised tone. For instance, 'ábóodziil ‘S/he is strong in a relative or comparative sense’. Contrast with bidziil ‘S/he is strong in an absolute sense.’
    c. Morpheme [l] in Valence
       i. Due to morpho-phonological processes in Navajo, the valence marker [l] sometimes fails to surface but instead is registered as a change in the quality of the stem-initial consonant. For instance, [l + zhóní] ‘pretty’ is realized as [shóní]. The valence marker [l] is never realized when the verb is marked for first-person subject due to morpho-phonological processes.

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5 This list gives all major types of degree construction. There is a small number of other degree modifiers that I will not consider here, e.g., t'íbi biláhágo ‘just a little bit more’.
6 The only constructions in which 'át'éego does not have to be used with a POS-marked verb are the high-degree (e) and superlative (j) constructions in Table 2.
7 While this paper deals solely with adjectival verbs in Navajo, the same categories (CA vs. AA vs. unmarked) are found throughout the Na-Dene language family and are realized through similar morphological means.
Changes in the stem (vowel lengthening, vowel tone raising, change in final consonant quality)

CA-marked adjectival verbs are translated by Young and Morgan (1987) as ‘X is Adj (in a relative or comparative sense).’ Morphemes (including the stem) that are indicative of CA-marking are subscripted with ‘\(CA\)’ in intralinear glosses.

\[
\text{CA-marked adjectival verbs are translated by Young and Morgan (1987) as ‘X is Adj (in a relative or comparative sense).’ Morphemes (including the stem) that are indicative of CA-marking are subscripted with ‘\(CA\)’ in intralinear glosses.}
\]

There is no set of adjectival verbs that can only be CA-marked. The ability to be CA-marked entails the existence of an AA-marked counterpart. AA morphology is the overt realization of POS. Indicators of AA are shown below.

AA-marked adjectival verbs are translated as ‘X is Adj (in an absolute sense)’ or simply ‘X is Adj’ by Young and Morgan (1987). Since I argue that AA-marked adjectival verbs are POS-marked expressions, indicators of AA-marking are subscripted with ‘\(POS\)’ in intralinear glosses.

The set of adjectival verbs that can be both CA-marked and AA-marked is given in Table 3. Table 3 contains all verbs for which both forms were found in Young and Morgan (1987) and was augmented through discussion with consultants. Apparent lexical gaps are indicated as ‘—’.

<table>
<thead>
<tr>
<th>Translation</th>
<th>AA-marked</th>
<th>CA-Marked</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-marked form used frequently by speakers, Young and Morgan (1987)</td>
<td>nitsaa</td>
<td>‘áníltsó</td>
</tr>
</tbody>
</table>
denoting negative-polar dimensions and qualities (e.g., slender, thin, mean). These verbs were only found in constructions where the morpheme ‘á’ is not used. These constructions are the postpositional equative (entry (c) in Table 2) and interrogative (entry (f) in Table 2) constructions.

The third section contains verbs denoting descriptive qualities (pretty, strong, fast, wet) for which Young and Morgan (1987) cites CA-marked forms. However, the CA-marked forms (e.g., ‘ánóoshóní) were not found frequently in examples of degree constructions in the dictionary or often volunteered in translations by consultants. Their AA-marked counterparts (e.g., nizhóní) were often used instead. This contrasts with the high frequency with which CA-marked forms of dimensional adjectival verbs (e.g., ‘áníłnééz ‘tall’ and ‘níłts’óózí ‘slender’) were used in degree constructions. Their AA-marked counterparts (nineez and ‘níłts’óózí) were exceedingly rare, to nonexistent, in degree constructions. Furthermore, speakers consulted were unsure of the acceptability of the CA-marked forms ‘ánóoshóní and ‘ádóotłéé’. I take this as evidence that these forms are marginal and perhaps archaic, especially in comparison to forms like ‘ánínléez and ‘áníiłtsó, which were used in free translations by speakers frequently and confidently.9

While existence of a CA-marked form entails the existence of an AA-marked counterpart, the entailment does not hold in the other direction. There are many verbs that can be AA-marked but not CA-marked. A small subset is given in Table 4. The set of adjectival verbs that can only be AA-marked consists of descriptive qualities, such as color terms and shapes. Also included are the negative-polar dimensional adjectives that I have not found marked by CA.10 Spots in the paradigm for which a first-person form would not be appropriate are left blank.

Table 4  Adjectival Verbs that Can Only Be AA-Marked

<table>
<thead>
<tr>
<th>Translation</th>
<th>1-person</th>
<th>3-person</th>
</tr>
</thead>
<tbody>
<tr>
<td>few</td>
<td>‘álehyéí</td>
<td>‘ált’aí</td>
</tr>
<tr>
<td>thin, shallow</td>
<td>‘ánisdzólí</td>
<td>‘áltdzólí</td>
</tr>
<tr>
<td>lightweight</td>
<td>nishchxon</td>
<td>nichxon</td>
</tr>
<tr>
<td>stinky</td>
<td>finishgai</td>
<td>fígai</td>
</tr>
<tr>
<td>white</td>
<td>finishhíí</td>
<td>léhíí</td>
</tr>
<tr>
<td>red</td>
<td>dinishjool</td>
<td>díjool</td>
</tr>
<tr>
<td>round, plump</td>
<td></td>
<td>chahaltlé’é</td>
</tr>
<tr>
<td>dark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fine, powdery</td>
<td></td>
<td>díbah</td>
</tr>
<tr>
<td>bubbly</td>
<td></td>
<td>dilchxosh</td>
</tr>
<tr>
<td>askew</td>
<td></td>
<td>digiz</td>
</tr>
</tbody>
</table>

Finally, a large number of adjectival verbs denoting descriptive qualities (shapes, textures, temperatures) cannot be either CA- or AA-marked. They instead appear to be ‘unmarked’ and will be referred to as such. Unmarked adjectival verbs do not have CA-marked counterparts. A partial list is given in Table 5. Since I argue that unmarked adjectival verbs are also POS-marked expressions, the stems of unmarked adjectival verbs are subscripted with ‘POSu’ in intralinear glosses.

(19)  deesdoi
3S-doiPOSu
‘It is hot.’

In this section, we have seen that CA and the AA form of POS are not realized as single morphemes but rather as sets of morphemes and phonological changes, as shown in (15) and (17). The realization of a single semantic feature as multiple morpho-phonological units is not limited to morphology found on adjectival verbs. Rather, it is a well-attested pattern found across the Na-Dene language family for many different types of semantic features, including tense, aspect, and mode. Early discussion of this typological tendency can be found in Kari (1979). Cable (2010) presents an updated picture, using data from Tlingit and Koyukon, two northern relatives of Navajo. Cable argues that semantic content (e.g., tense, aspect, and mode) is not expressed through primitive features that map onto individual functional heads. Rather, it is expressed through a series of semantically light morphemes that work in concert but lack meaning on their own. Among the sets of morphemes considered by Cable (2010) is Tlingit comparative aspect, which, like in Navajo, is expressed by means of multiple morphological units.

9 The lexical entries in Young and Morgan (1987) come from sources produced between 1910 and 1974 (Young and Morgan 1987: gv). Conversation with speakers and observation of discussions at the 2008 and 2010 meetings of the Navajo Language Academy reveal that while the dictionary is still an overall accurate account of Navajo as it is currently spoken, the dictionary occasionally is found to contain forms felt to be archaic and and which have fallen into disuse.

10 The prefix ni undergoes tone raising when preceded by the derivational prefix ‘á’ giving the impression of these adjectival verbs being CA-marked. However, observe that the prefix disappears in third-person forms. This behavior differentiates raised tone forms of ni from the comparative aspect prefix ni.
### Table 5 Unmarked Adjectival Verbs

<table>
<thead>
<tr>
<th>Translation</th>
<th>3-person</th>
</tr>
</thead>
<tbody>
<tr>
<td>frozen</td>
<td>hastin</td>
</tr>
<tr>
<td>hot (object)</td>
<td>sido</td>
</tr>
<tr>
<td>hot (weather)</td>
<td>deesdoi</td>
</tr>
<tr>
<td>burnt</td>
<td>dīlīd</td>
</tr>
<tr>
<td>slippery</td>
<td>hwīídéeltǫ’</td>
</tr>
<tr>
<td>protruding</td>
<td>k’ez’a</td>
</tr>
<tr>
<td>warm</td>
<td>neezílí</td>
</tr>
<tr>
<td>fat</td>
<td>neesk’á</td>
</tr>
<tr>
<td>speckled</td>
<td>yist’il</td>
</tr>
<tr>
<td>moist</td>
<td>náshzhoh</td>
</tr>
<tr>
<td>tender, fluffy</td>
<td>yílzhóí</td>
</tr>
</tbody>
</table>

### 3.4 Organizing the Adjectival Verbs

Before moving on, we will first consider how the sets of adjectival verbs described in Section 3.3 can be organized. In subsequent sections, two organizations of the three sets (CA-marked, AA-marked, unmarked) of adjectival verbs will be referenced. Each organization will be relevant to a different area of grammatical contrasts (morphology, syntax, and semantics). The first mode of organization separates CA-marked adjectival verbs from POS-marked (or, AA-marked plus unmarked) adjectival verbs (i.e., column 3 of Table 3 vs. all other adjectival verbs). This division is relevant to our discussion of contrasts attributed to morphological marking, as well as to the availability of adjectival verbs to be used in particular degree constructions. We will see that CA-marked verbs behave morphologically and syntactically like transitive expressions while all POS-marked verbs behave like intransitive expressions. Furthermore, CA-marked verbs can be used in degree constructions in which degree abstraction over an open degree argument takes place (subcomparative, deictic that-phrase, and measure phrase constructions) and, when used in the interrogative construction, permit a true degree reading (i.e., permit a measure phrase as a response). I take this as evidence that CA-marked verbs have a type <det> meaning while POS-marked adjectival verbs are of type <et>. After presenting these arguments in favor of the proposal in (10), an interim summary will be presented. At this point, our findings for Navajo will be related to data from Russian. In Russian, like Navajo, a scalar, type <det> meaning is only licensed for adjectives in the presence of particular morphology. In Russian, the licensing morpheme is the synthetic comparative marker.

The second method of organization separates ‘contrastive’ adjectival verbs (i.e., stems with CA-marked and POS-marked forms) from ‘noncontrastive’ adjectival verbs (i.e., stems with only POS-marked forms). A note is in order on the definition of these two classes of adjectival verbs. At first glance, it would appear that this mode of organization would divide the forms in Table 3 from the forms in Table 4 and Table 5. In fact, I argue that included in the set of noncontrastive adjectival verbs are the following forms from Table 3: ‘pretty’ (nizhóní, ‘ánóoshóní), ‘strong’ (bidziil, ‘ábóodziil), ‘fast’ (dilwo’, ‘ádóolwo’), and ‘wet’ (ditlêé’, ‘ádóotlêé’). Recall from discussion in Section 3.3 that the CA-marked forms of these verbs are marginal in terms of frequency of use, acceptability, and stability of morphological form. The CA-marked form is not a sufficiently salient option to form a contrastive pair with the AA-marked form.

Returning to the implications of the contrastive vs. noncontrastive status for the present proposal, when contrastive POS-marked adjectival verbs (i.e., those with CA-marked counterparts) are used in the comparative and equative constructions, the construction is obligatorily norm-related. However, when noncontrastive POS-marked adjectival verbs are used in these degree constructions, the construction optionally receives a norm-related interpretation but the norm-relatedness is a cancellable implicature. The analysis of POS is presented in Section 7.3.

### 4 Morphological and Syntactic Evidence for Contrasts in Adjectival Semantics

This section presents syntactic and morphological evidence in favor of an analysis of CA-marked adjectival verbs as transitive, type <det> expressions. In the area of morphology, we find that CA-marked verbs exhibit the valence marker [f], a well-studied indicator of transitivized argument structure (Hale 2000). With respect to syntax, we see that degree expressions are obligatorily present and adjacent when they modify CA-marked verbs. This contrasts with degree expressions and other modifiers optionally used with POS-marked verbs, where they are obligatorily marked as adverbial and in a looser syntactic relation with the verb. While the morphological evidence suggesting that CA-marked and POS-marked adjectival verbs have a different argument structure is, by design, relevant only to contrastive verbs, all POS-marked verbs - both contrastive and non-contrastive - exhibit the same behavior with respect to the syntactic diagnostics discussed below.
4.1 Transitivization Marked by Valence Marker

Morphology provides the first piece of evidence that CA-marked adjectival verbs bear an argument position (degree argument) that is not part of the meaning of POS-marked adjectival verbs. In Navajo, as in other Athabaskan languages, transitivization of action-denoting verbs is marked with the shift of the valence marker from $[\emptyset]$ to $[l]$.

(20) a. Tóshjeeh sits’il
   barrel $3S$-$\emptyset$-shattered
   ‘The barrel shattered, broke to pieces.’

b. Łeets’a’ sêts’il
   dish $1sgS$-$l$-shattered
   ‘I shattered the dish.’

(Hale 2000: 86)

(21) a. Tsinaa’eeł sits’ánl’éél
    boat $1sgO$-from-$3S$-$\emptyset$-floated
    ‘The boat drifted away from me.’

b. Ashkii tsinaa’eeł sits’éiníł’éél
    boy boat $1sgO$-from-$3S$-$l$-floated
    ‘The boy rowed the boat away from me.’

(Hale 2000: 83)

Shift in the valence marker from $[\emptyset]$ to $[l]$ is one of the changes distinguishing most AA-marked adjectival verbs from their CA-marked counterparts. The pattern is robust in Navajo and well-attested in other Athabaskan languages (Bogal-Allbritten, to appear). There are a few pairs of AA-marked and CA-marked verbs for which the process is not entirely regular. For example, some CA-marked adjectival verbs retain the $[\emptyset]$ valence marker. In addition, adjectival verbs denoting negative-polar dimensions always bear the $[l]$ valence marker regardless of whether they are POS- or CA-marked.\footnote{11}

(22) a. nineez
    $ni_{POS_A}$-$3S$-$\emptyset_{POS_A}$-tall$_{POS_A}$
    ‘S/he is tall.’

b. ’áññnééz
    $\acute{\alpha}_{CA}$-ni$_{CA}$-$3S$-$l_{CA}$-tall$_{CA}$
    ‘S/he is tall (in a relative or comparative sense).’

(23) a. nidaaz
    $ni_{POS_A}$-$3S$-$\emptyset_{POS_A}$-heavy$_{POS_A}$
    ‘S/he is heavy.’

b. ’áññldáás
    $\acute{\alpha}_{CA}$-ni$_{CA}$-$3S$-$l_{CA}$-heavy$_{CA}$
    ‘S/he is heavy (in a relative or comparative sense).’

The shift in valence markers illustrated above suggests that CA-marked adjectival verbs are transitive expressions. This pattern is consistent with an analysis in which CA-marked adjectival verbs take a degree and an individual as arguments, while POS-marked adjectival verbs are intransitive expressions, taking only an individual as argument.

Valence shift is, by design, a diagnostic that is only useful for contrastive verbs since we are comparing the CA-marked form with the POS-marked form. Unmarked adjectival verbs do not have CA-marked counterparts so no relevant pairs illustrating valence marker shift can be constructed using verbs like deesdoi ‘hot.’ However, for AA-marked, non-contrastive adjectival verbs, we may observe that the majority of forms in Table 4 bear the $[\emptyset]$ valence marker, suggesting an intransitive argument structure.\footnote{12}

\footnote{11} Recall from discussion surrounding (15) that the presence of $[l]$ is often obscured by morpho-phonological processes.

\footnote{12} The major exception to this generalization is the adjectival verbs denoting negative-polar dimensions which, as noted above, always bear the $[l]$ valence marker.
4.2 Degree Expressions Are Obligatory with CA-Marked Verbs

The second piece of evidence that CA-marked adjectival verbs select for two arguments is that they are only grammatical when modified by a degree expression. As shown below, a CA-marked adjectival verb cannot be offered in isolation as a response to a question.

(24) a. How tall is your mother?
   b. Shimá *(hastadjí ‘adées’eeez) ’ánílnééz.
      1poss-mother six feet ’áCA-tííCA-3S-ICA-tallCA
      ‘She is 6ft tall.’

(25) a. Is your mother tall?
   b. Shimá *(‘ayóó) ’ánílnééz.
      1poss-mother very ’áCA-tííCA-3S-ICA-tallCA
      ‘She is (very) tall.’

By contrast, if the adjectival verb is POS-marked, degree expressions are optional. This is true for all POS-marked adjectival verbs, both contrastive and noncontrastive, as shown below.

(26) a. Nimáásh nineez?
   2poss-mother-QPRT niPOSₐ-3S-∅POSₐ-tallPOSₐ
   ‘Is your mother tall?’
   b. *(‘Ayóó) nineez.
      (very) niPOSₐ-3S-∅POSₐ-tallPOSₐ
      ‘She is (very) tall.’

(27) a. Tóósh sido?
   water-QPRT 3S-hotPOSₚ
   ‘Is the water hot?’
   b. *(‘Ayóó) sido.
      (very) 3S-hotPOSₚ
      ‘It is (very) hot.’

Additionally, the degree argument of a CA-marked adjectival verb must be valued by a degree expression. It is not sufficient for the degree argument to be valued by an overt standard of comparison in an adjoined clause. For example, (28) cannot have the interpretation ‘my younger sister is slender but I am chunky (compared to her)’ if ‘ayóó ‘very’ is removed from the second clause where it modifies the CA-marked verb ’áníshdíil. A degree expression does not have to modify the POS-marked verb ’álts’óózi in the first clause.

(28) Shideezhí ’éí ’álts’óózi shí ’éí *(‘ayóó) ’áníshdíil
    1poss-younger.sister TOP niPOSₐ-3S-∅POSₐ-slenderPOSₐ 1sg TOP very ’áCA-tííCA-1sgS-ICA-thickCA
    ‘My younger sister is slender but I am chunky.’

(Adapted from Young and Morgan 1987: d117)

I take the obligatory use of degree expressions with CA-marked adjectival verbs as evidence that they are transitive expressions, taking both a degree and an individual as arguments. In the absence of the additional information about the degree argument provided by the degree expression, the CA-marked adjectival verb has an incomplete meaning. By contrast, given the semantics I have proposed for POS, once a POS-marked adjectival verb has composed with a subject, further modification by a degree expression is unnecessary.
4.3 Degree Expressions are Adverbial Modifiers of POS-Marked Adjectival Verbs

So far, I have demonstrated that when used with CA-marked adjectival verbs, degree expressions are obligatorily present. No such restriction holds of POS-marked adjectival verbs. In this section, I show that degree expressions modifying POS-marked adjectival verbs are adverbial modifiers while degree expressions modifying CA-marked adjectival verbs display behavior more consistent with arguments. Two pieces of evidence are cited. First, when the verb is POS-marked, degree expressions must be overtly marked as adverbial. Degree expressions modifying CA-marked adjectival verbs cannot be marked as adverbial. Second, degree expressions modifying POS-marked adjectival verbs exhibit the same loose locality relationship with the verb as found for adverbial modifiers of Navajo verbs more generally. By contrast, degree expressions modifying CA-marked verbs are obligatorily adjacent to the verb.

Degree expressions modifying POS-marked verbs obligatorily bear an overt marker of subordination and adverbialization, -go. Given that the subordinator -go primarily marks clausal constituents, the degree expression must be introduced by the copula ‘át’ée ‘it is,’ which is always marked for third-person subject. The entire degree expression+copula constituent is then subordinated by -go.

(29) a. Shideezí bimági *(‘át’éeego) nizhóní
lposs-younger.sister 3poss-mother-LOC 3S-be-SUB ni\(\text{POS}_A\)-3S-\(\text{\textdollar}\text{POS}_A\)-pretty\(\text{POS}_A\)
‘My little sister is pretty like her mother.’

b. Nigi *(‘át’éeego) nisneez
2sg-LOC 3S-be-SUB ni\(\text{POS}_A\)-1sgS-\(\text{\textdollar}\text{POS}_A\)-tall\(\text{POS}_A\)
‘I am tall like you.’

c. Kééhasti’iggí Phoenix bilááh *(‘át’éeego) deesdoi
1sgS-dwell-COMP Phoenix 3O-beyond 3S-be-SUB 3S-hot\(\text{POS}_U\)
‘It is hotter than Phoenix where I live.’

(Young and Morgan 1987: g193)

As shown in (30), if an adjectival verb is CA-marked, the degree expression cannot be adverbialized.14

(30) a. Shideezí bimági *‘ánóoshóní
lposs-younger.sister 3poss-mother-LOC 3S-be-SUB ‘án\(\text{CA}\)-ni\(\text{CA}\)-3S-\(\text{\textdollar}\text{CA}\)-pretty\(\text{CA}\)
‘My little sister is as pretty as her mother’

b. Shínaaí bilááh *‘ánishdííl
1poss-older.brother 3O-beyond 3S-be-SUB ‘án\(\text{CA}\)-ni\(\text{CA}\)-1sgS-\(\text{\textdollar}\text{CA}\)-big\(\text{CA}\)
‘I’m larger than my older brother.’

(Young and Morgan 1987: d85)

The same pattern of adverbialization of the degree expression is found in the interrogative construction. If the verb is CA-marked, the degree expression haa ‘how’ must directly precede the verb. Recall that for CA-marked verbs, the interrogative construction is one in which the degree expression is morphologically bound to the left edge of the verb word.

(31) a. Haaníhnéez?
WH-ni\(\text{CA}\)-3S-\(\text{\textdollar}\text{CA}\)-tall\(\text{CA}\)
‘How long is she/he/it?’ (Possible answers: ‘6ft tall,’ ‘very/not very tall’)

b. Haanítt’sóózi?
WH-ni\(\text{CA}\)-3S-\(\text{\textdollar}\text{CA}\)-slender\(\text{CA}\)
‘How slender is she/he/it?’ (Possible answers: ‘3in wide,’ ‘very/not very slender’)

For POS-marked adjectival verbs, haa must be marked as adverbial.15

13 The only degree expressions that do not have to be marked as adverbial are ‘ayóó and the superlative postpositional construction. I leave further explanation for these exceptions to future work.

14 Young and Morgan (1987) cite two examples of degree expressions marked only with -go (without ‘át’ée) modifying CA-marked adjectival verbs. Speakers found these forms somewhat degraded. Insertion of ‘át’ée resulted in total ungrammaticality.

15 The adverbialized form of the copula used in the interrogative construction, yi’éeego, is slightly different from the form found elsewhere, ‘át’éeego. I abstract away from this difference as it appears to have no ramifications for any portion of the analysis developed here.
Some degree expressions can be used with non-adjectival verbs with translations similar to those attributed to degree expressions used with POS-marked adjectival verbs. I cite the following example to demonstrate that with respect to adverbialization of degree expressions, POS-marked adjectival verbs pattern like action-denoting verbs. If all verb-external modifiers of action-denoting verbs are adverbial (as suggested in Faltz (2000)) and modifiers of POS-marked adjectival verbs pattern like modifiers of action-denoting verbs, then this suggests that modifiers of POS-marked adjectival verbs are also adverbial. I leave further discussion of the link between degree expressions and expressions of similarity to future work.

Thus far, we have taken inclusion of 'át’éego as a diagnostic of the adverbial status of degree expressions modifying POS-marked verbs. Another piece of evidence to this end is that when they modify POS-marked verbs, degree expressions are not subject to tight locality restrictions. They are free to undergo topicalization such that multiple words intervene between the adjectival verb and the degree expression. The sentences in (34) illustrate this possibility for the locative enclitic-marked equative construction. The sentences in (35) make the same point for the postpositional comparative construction.

Action-denoting verbs patterned like POS-marked adjectival verbs with respect to the use of 'át’éego. The two classes of verbs also pattern similarly with respect to (the lack of) locality restrictions on degree expressions. Compare (36) with (34). In (36), the locative phrase Kinlánídi ‘at/in Flagstaff’ can either directly precede the verb or be topicalized. The loose locality restrictions are expected if locative expressions are adverbial modifiers, as they would be under the standard assumption that action-denoting verbs are fully saturated when syntactically visible (Faltz 2000).\footnote{The locative particle in these examples, -di, does not pattern differently from -gi with respect to locality restrictions elsewhere in the grammar.}
In contrast with both POS-marked and action-denoting verbs, CA-marked adjectival verbs require degree expressions to be directly adjacent to the left edge of the verb. I take this as evidence that degree expressions are in a unique relationship with CA-marked adjectival verbs. This relationship is consistent with an analysis of CA-marked verbs as transitive expressions. The locality restrictions are illustrated for the locative enclitic-marked equative and comparative constructions by (37) and (38), respectively.

(37) a. Shideezhí bimági 'ánóoshoni
1poss-younger.sister 3poss-mother-LOC 'āCA-niCA-3S-lCA-pretyCA
‘My little sister is as pretty as her mother’

b. *Bimági shideezhí 'ánóoshoni
3poss-mother-LOC 1poss-younger.sister 'āCA-niCA-3S-lCA-pretyCA
(‘My little sister is as pretty as her mother’) (38) a. Shizhé'é shilááh 'ánílnééz
1poss-father 1sgO-beyond 'āCA-niCA-3S-lCA-tallCA
‘My father is taller than I am.’

b. *Shilááh shizhé'é 'ánílnééz
1sgO-beyond 1poss-father 'āCA-niCA-3S-lCA-tallCA
(‘My father is taller than I am.’)

In this section, we have considered two types of evidence that degree expressions modifying POS-marked adjectival verbs are adverbial expressions. This is in line with our analysis of these verbs as type <et> vague predicates. By contrast, degree expressions modifying CA-marked adjectival verbs can be neither marked as adverbial nor allowed to undergo the types of movement (e.g., topicalization) available to adverbial expressions. I take this as evidence that CA-marked verbs are transitive, type <det> expressions.

5 Availability of Constructions Requiring an Open Degree Argument

The final diagnostic that will allow us to separate the set of CA-marked verbs from the set of all POS-marked verbs (both contrastive and noncontrastive) is the inability of POS-marked adjectival verbs to be used in the measure phrase, deictic that-phrase, and subcomparative constructions. Only CA-marked adjectival verbs are grammatical in these constructions. I assume that these constructions involve abstraction over a degree argument, following the analyses adopted by von Stechow (1984), Kennedy (1999), Heim (2000), and others. In addition, a true degree reading for the interrogative construction is only licensed for CA-marked adjectival verbs. When POS-marked verbs are used, the interpretation of the construction reflects the vague predicate status of the verb. These findings are consistent with an analysis in which CA-marked adjectival verbs have a type <det> meaning while all other adjectival verbs have a type <et> meaning that is incompatible with degree abstraction constructions.

We will first consider the restriction of the measure phrase and deictic that-phase constructions to use with CA-marked verbs. Following the framework summarized in Heim (2000), I take measure phrases and deictic that-phrases to be degree-denoting expressions. Because they directly saturate the predicate’s degree argument, the ability of an adjectival verb to take a measure phrase or that-phrase can serve as a diagnostic for a <det> vs. <et> meaning.

(39) a. Sandy is 5ft tall.
   b. [tall(5ft)(Sandy)]

As in many languages, deictic that-phrases in Navajo can be used with both positive-polar and negative-polar dimensional adjectival verbs, as well as (CA-marked) verbs denoting descriptive qualities. Use of this construction is typically accompanied by a gesture or reference to an object in the real world.

17 When the deictic prefix ko- ‘thus’ is used, ‘á’ is optional. When ‘á’ is not overtly realized, ko- is realized with a high tone as kó-.
Measure phrases are restricted to positive-polar dimensional adjectival verbs. This is a cross-linguistically common restriction discussed by von Stechow (1984), Kennedy (1999), Schwarzschild (2005), and Svenonius and Kennedy (2006), among many others. The distribution of measure phrases in Navajo is very regular. Any CA-marked adjectival verb that denotes a positive-polar dimension can take a measure phrase, as in (41a) and (42a). As shown in (41b) and (42b), POS-marked adjectival verbs cannot take measure phrases.

(41) a. Tseebíí dahidídlo’ ániłdáás
     eight pound  ánìCA-níCA-3S-ìCA-heavyCA

     ‘It weighs eight pounds.’

b. *Tseebíí dahidídlo’ nidaaz
     eight pound  nìPOS-3S-∅POS-ànìCA-3S-ìCA-heavyPOS

     (‘It weighs eight pounds.’)

(42) a. Káá’tśíní náhást’éí dóó náá’áni’ji’ ké siiláági ániłnééz
     alligator nine and half  foot-LOC ánìCA-níCA-3S-ìCA-longCA

     ‘The alligator is nine and a half feet long.’

b. *Káá’tśíní náhást’éí dóó náá’áni’ji’ kée siiláági nineez
     alligator nine and half foot-LOC nìPOS-3S-∅POS-ànìCA-3S-ìCA-longPOS

     (‘The alligator is nine and a half feet long.’)

The restriction of measure phrases and deictic that-phrases to CA-marked adjectival verbs supports the hypothesis that CA-marked adjectival verbs are of type <det> while POS-marked adjectival verbs are expressions of type <et>. Like the measure phrase and deictic that constructions, subcomparatives are only available if abstraction can take place across a degree argument. The subcomparative construction has the same semantics as (clausal) comparative constructions in general but the embedded predicate is not elided.

(43) a. The table is higher than the door is wide.

b. [MORE] = λQdt. λPdt. MAX(P) > MAX(Q)

c. [MORE](λd.door d-wide)(λd.table d-high)

d. MAX(λ d.d.table d-high) > MAX(λ d.door d-wide)

In Navajo, both adjectival verbs must be CA-marked in the subcomparative construction. This restriction is consistent with an analysis in which only CA-marked verbs have a degree argument. POS-marked adjectival verbs are predicted - and found - not to occur in the subcomparative construction because they lack a degree argument over which abstraction can occur.\(^{18,19}\)

(44) a. Díí naaltsoos ániłnééez
     DET book  ánìCA-níCA-3S-ìCA-wideCA-COMP 3’O-beyond ánìCA-níCA-3S-ìCA-longCA

     ‘This book is longer than it is wide.’

(Adapted from Young and Morgan 1987: g193)

\(^{18}\) In Navajo as in English, positive polar dimension-denoting adjectival verbs associated with salient measurement systems are strongly preferred and other adjectival verbs (even when marked with CA) are of marginal acceptability. As such, I have only included verbs of this type - which all happen to be contrastive - in this section.

\(^{19}\) In the Navajo subcomparative construction, the subordinated verb is obligatorily marked with a complementizer/nominalizer, -ígíí or -i.
b. Ch’é’étiin bikáá’adání 'ányňénéę́zígi bikáá’adání 'ányňtéel

doorway table 'áC-CA-níC-CA-3S-lCA-longC-CA-COMP-LOC 'áC-CA-níC-CA-3S-lCA-wideCA

'The doorway is as wide as the table is long.'

(45) a. *Díí naaltsoos niteelígíi yilááh 'ányňénéę́z
DET book niPOS-3S-∅POS-widEPOS-COMP 3’O-beyond 'áC-CA-níC-CA-3S-lCA-wideCA

('This book is longer than it is wide')

b. *Díí naaltsoos 'ányňtéélígíi yilááh át’éego
DET book 'ánC-CA-níC-CA-3S-lCA-wideCA-COMP 3’O-beyond 3S-be-SUB
nineez niPOS-3S-∅POS-longPOS

('This book is longer than it is wide')

The final point of contrast that we will consider is the restriction of degree readings to interrogative constructions
with CA-marked adjectival verbs. When POS-marked adjectival verbs are used in the interrogative construction, the
construction receives an interpretation suggesting that the verb is a vague predicate rather than a scalar expression. The
answers to the questions in (46) are made with reference to a contextual norm rather than to an exact degree (e.g., a
measure phrase).20,21

(46) a. Haa yit’éego deesdoi?
WH 3S-be-SUB 3S-hotPOSU

‘How hot is it?’ (Possible answers: ‘very/not very hot,’ ‘hot for Phoenix’)

b. Haa yit’éego náshzhoh?
WH 3S-be-SUB 3S-moistPOSU

‘How moist is it?’ (Possible answers: ‘very/not very moist,’ ‘moist for cake’)

c. Haa yit’éego nichxon?
WH 3S-be-SUB niPOS-3S-∅POS-stinkyPOS

‘How stinky is it?’ (Possible answers: ‘very/not very stinky,’ ‘stinky for a cheese’)

By contrast, the ‘true’ degree reading is attributed to interrogative constructions featuring abstraction over a degree
argument. The operator HOW_d ranges over degrees along the scale of tallness. The maximal degree is picked out by the
operator MAX. For a proposal along these lines, see Rullmann (1995).

(47) a. How tall is Sandy?

b. HOW_d[ MAX( ‘łd’. Sandy is d’-tall)]

The true degree reading is possible for CA-marked verbs. Both questions in (48) can be answered with a measure
phrase. Reference can be made to a standard if, for instance, the degree expression ‘ayóo ‘very’ is used, but it is not a
necessary component of the answer as it was in (46).

(48) a. Haaníłnééz?
WH-níC-CA-3S-lCA-talllCA

‘How long is she/he/it?’ (Possible answers: ‘6ft tall,’ ‘very/not very tall’)

b. Haaníñi’sóózi?
WH-níC-CA-3S-lCA-slenderCA

‘How slender is she/he/it?’ (Possible answers: ‘3in wide,’ ‘very/not very slender’)

Note that the verb in (48b) can only be used to question the width of objects known from context to be slender, such as
a belt or cut of meat. We will make a brief digression to consider why this is the case. The norm-relatedness of negative-
polar dimensional adjectival verbs is a cross-linguistically attested pattern discussed in Rett (2008). In both English and
Navajo, these expressions have a scalar, type <det> meaning but can only be used if the subject exhibits the property to
a degree exceeding the contextual standard. In Navajo, the CA-marked forms of negative-polar dimensional adjectival
verbs are only attested in the equative and postpositional interrogative constructions.

20 The possibility of a measure phrase is not a relevant diagnostic of a degree semantics here, given that a measure phrase would not be a
reasonable answer to a question containing any of the adjectival verbs in (46). Requests for temperature in Navajo are made using a non-adjectival
verb, not deesdoi ‘hot,’ ‘sik’úz ‘cold,’ etc.

21 The semantic picture for POS-marked adjectival verbs used in different degree constructions will be somewhat complicated by the distinction
between contrastive and noncontrastive POS-marked adjectival verbs. I return to this issue in Section 7.
a. Shimá sheenilts'óózí
   lposs-mother 1sgO-with-níC_A-3S-I_C_A-slender_C_A
   ‘My mother is as slender as I am.’

b. Haanilts'óózí?
   WH-níC_A-3S-I_C_A-slender_C_A
   ‘How slender is she/he/it?’

These are the two constructions that Rett (2008) discusses for English. In English, when negative-polar dimensional adjectives are used in the interrogative and equative constructions, the adjective must be marked by a morpheme EVAL. As shown in (50), EVAL is a function from the domain of degrees to a subset of degrees that exceed the contextual standard, $c$.

\[
[EVAL] = \lambda d. \lambda d. D(d) \land d > c
\]

(Adapted from Rett 2008: 213)

EVAL introduces a norm-related interpretation to the adjective in order to differentiate a construction like ‘Sandy is as short as Jane’ from the construction ‘Sandy is as tall as Jane,’ where the adjective ‘short’ has been replaced by its positive polar antonym ‘tall.’ If ‘short’ did not have a norm-related interpretation due to EVAL, both sentences would have the same truth conditions, being true just in case the height of Sandy equals (or exceeds) the height of Jane. Rett (2008) assumes that the negative-polar members of antonymic pairs are ‘marked’ relative to their positive-polar counterparts. Given the equivalent truth conditions and a universal principle according to which speakers avoid using a marked form whenever possible, only the norm-related reading of sentences like ‘Sandy is as short as Jane’ is permitted. This generalization extends to the interrogative construction. For example, ‘How short is Sandy?’ obligatorily has a norm-related reading due to competition with ‘How tall is Sandy?’ The same principle of ‘avoid identity (of truth conditions)’ applies to govern the distribution of EVAL in Navajo. If the adjectival verb in (48b) did not contain EVAL, it would be truth conditionally equivalent to (48a).22

The concepts of contrastive pairs and avoidance of identity of truth conditions will both be relevant to our expanded account of POS in Navajo, undertaken in Section 7.

6 Interim Summary and Cross-linguistic Implications

6.1 Summary of the Analysis

The primary contention of this paper is that only a subset of Navajo adjectival verbs - those that are CA-marked - have a scalar, type <det> semantics. POS-marked adjectival verbs are vague predicates of type <et>. The morphological, syntactic, and semantic evidence for this proposal presented in the preceding sections is summarized in (51).

a. CA-marked adjectival verbs:
   i. Bear morphology indicative of transitive argument structure.
   ii. Are obligatorily modified by adjacent degree expressions.
   iii. Occur in degree constructions requiring degree arguments.

b. POS-marked adjectival verbs:
   i. Are optionally modified by degree expressions.
   ii. Are modified by degree expressions overtly marked as adverbial.
   iii. Do not occur in degree constructions requiring a degree argument.

While I leave to future work a detailed account of the semantics and distribution of EVAL in Navajo, several comments can be made. It appears that the distribution of EVAL would be much the same as it is in English: EVAL composes with adjectives that, if used in a particular degree construction, would result in truth conditions that are the same as the same construction with a different adjective. I assume that composition with EVAL takes place after composition with CA has already occurred. With this assumption in place, the semantics proposed by Rett (2008) for English, repeated in (50) will also suffice for Navajo. I assume that EVAL composes with the verb after composition with CA for two reasons. First, if EVAL were allowed to compose with any stem denoting a negative-polar dimension, then if the stem later composed with POS there would be redundancy in our semantics: norm-relatedness would be introduced twice. Second, by placing EVAL further from the verb stem, we avoid our analysis resembling one in which the distribution of EVAL is determined in the lexicon.
CA has the denotation in (52). CA has the same semantics as MEAS in Svenonius and Kennedy’s (2006) analysis of Northern Norwegian. After composition with the type <ed> verb stem, a CA-marked adjectival verb has the scalar semantics attributed to all adjectives under the standard model of adjectival semantics.

\[(52) \quad [\text{CA}] = \lambda g_{ed} \lambda d \lambda x. g(x) \geq d\]

POS-marked adjectival verbs have a type <et> meaning. For the moment, I remain agnostic as to the semantics of POS. In Section 7, I will argue that the primary function of POS is to convert a type <ed> verb stem into a type <et> expression. In contrast with previous proposals for POS under both the standard and decompositional models (e.g., Cresswell 1976, Kennedy 2007), I argue that relation of a degree to a contextual standard is not part of the basic meaning of POS. The norm-related interpretation of POS is available only under particular semantic circumstances.

I return to POS in Section 7. For now, we can focus on the primary contributions of the Navajo data to our perspective on the typology of adjectival semantics. In Navajo, adjectival verbs are not born in the lexicon with a scalar, type <det> meaning. The distribution of the <det> meaning is determined by the distribution of particular degree morphology, CA. Given the restriction of CA morphology to primarily dimension-denoting verb stems, only a small subset of adjectival verbs have a scalar, type <det> semantics. All other adjectival verbs are POS-marked and have a type <et> meaning.

The decompositional account that I have argued for is not the only possible interpretation of the data. Schwarzschild (2010) sketches an alternate account of a subset of the data presented here, assuming the standard model such that most Navajo adjectival verb stems are type <det> expressions.23 Schwarzschild’s account does not propose a semantics for CA.

I argue that the decompositional approach is preferable if we wish to maintain a fully compositional account where all morphemes (or sets of morphemes) make a semantic contribution, while also accounting for relative markedness. Adjectival verbs exhibiting a type <det> semantics are more ‘marked’ in two senses. First, in terms of distribution. The scalar, type <det> meaning is available only for a very limited subset of adjectival verbs. If this meaning were basic to all stems, it seems uneconomical to have it only be preserved for a limited number of adjectival verbs.

Second, in terms of complexity of morphological marking. CA-marked adjectival verbs feature a morpheme (‘á) at the left periphery of the verb whereas no POS-marked adjectival verb does. CA-marked adjectival verbs also often feature verb stems that appear to have undergone particular phonological changes (raised tone, consonant shift). Finally, CA-marked adjectival verbs often feature shift from the [I] valence morpheme to the [I] valence morpheme. If the <det> semantics were fundamental to all adjectival verbs, one must ask what - if anything - these morphological changes indicate.

Whether the standard or decompositional model ultimately proves most tenable, however, the primary point of this paper still stands. Scalar, type <det> meaning is only available for adjectival verbs in the presence of particular morphology. We can argue - as I have - that scalar meaning is licensed by CA due to the (type < <ed>, <det >>) semantics of CA. We could also argue - in the spirit of Schwarzschild (2010) - that scalar meaning is basic to all adjectival verbs but is only retained in the presence of CA morphology since if an adjectival verb is not marked with CA, then it must be marked by POS.

6.2 Russian: Licensing Scalar Meaning with Comparative Morphology

Navajo is not the only language in which the scalar, type <det> meaning is restricted to lexical items bearing particular morphology. As discussed by Krasikova (2009), Russian adjectives always have a norm-related, type <et> semantics except when marked by the synthetic comparative morpheme. The synthetic comparative is the only degree construction involving overt synthetic degree morphology. Adjectives in all other degree constructions appear in their ‘unmarked’ form and are obligatorily norm-related, suggesting that they are POS-marked.

The first type of evidence presented by Krasikova (2009) is the unavailability of the subcomparative construction in Russian. The sentence in (53) cannot have the interpretation in which the length and width of the bed are being compared directly.24 In the equative subcomparative construction, both adjectives are in their ‘unmarked’ form. If unmarked adjectives are, in fact, POS-marked such that they lack a degree argument over which abstraction can occur, it follows that the subcomparative construction will not be possible.

\[(53) \quad \text{Эта кровать не настолько длинная, насколько широкая}\]

DET bed NEG by.that.much long by. how. much wide

‘This bed is not as long as it is wide.’

---

23 Schwarzschild (2010) takes the stems of ‘unmarked’ adjectival verbs to have composed with POS in the lexicon, such that they are of type <et>.

24 Krasikova (2009) reports the availability of a comparison of deviation reading, in which the bed is more notable for its (positive degree of) width than for its (positive degree of) length. This reading is consistent with a semantics in which both adjectives are POS-marked.
Similarly, differential measure phrases are licensed only for adjectives marked by the synthetic comparative morpheme, as in (54a). If the analytic comparative morpheme is used, as in (54b), ungrammaticality results. This pattern follows if a scalar, type <det> semantics is only licensed by the synthetic comparative morpheme. In (54b), while the analytic comparative morpheme is present, the adjective receives a non-scalar interpretation because, although marked by the analytic morpheme at a higher level, the adjective appears in its morphologically unmarked form. Measure phrases cannot be used with adjectives lacking a scalar, type <det> semantics.

(54) a. Кровать на 4см шире, чем диван
   bed by 4cm wide-ER than sofa
   The bed is 4cm wider than the sofa

   b. *Кровать на 4см более широкая, чем диван
      bed by 4cm MORE wide than sofa
      (The bed is 4cm wider than the sofa)

Krasikova (2009) further argues that unmarked adjectives are, in fact, POS-marked with examples like (55). Krasikova assumes a traditional, norm-related semantics for POS. When the synthetic comparative morpheme is used as in (55a), it is possible to claim that Katja is taller than Sergej but that she does not meet a contextual standard for tallness. By contrast, when the analytic comparative morpheme is used as in (55b), if Katja is ‘more tall’ than Sergej, she also must be considered tall in the context.

(55) a. Катя не высокая, но она выше, чем Сергей
   Katja NEG tall but she tall-ER than Sergej
   Katja is not tall, but she is taller than Sergej.

   b. Катя не высокая, *но она более высокая, чем Сергей
      Katja NEG tall but she MORE tall than Sergej
      (Katja is not tall, but she is taller than Sergej).

The norm-related interpretation is also forced when adjectives are used in degree questions, as in (56). A measure phrase is not an appropriate response to either question regardless of the polarity of the adjective. The only possible responses, according to Krasikova (2009), invoke the contextual norm (e.g., ‘the desk is wide for a desk in our department’).

(56) a. насколько стол широкий?
    by.how.much desk wide
    How wide is the desk?

   b. насколько стол узкий?
      by.how.much desk narrow
      How narrow is the desk?

These data strongly suggest that a scalar, type <det> meaning is licensed only by the synthetic comparative morpheme. All other adjectives have a type <et> semantics suggesting that the adjective is POS-marked. Krasikova (2009) proposes that all adjectives in Russian are ambiguous between a scalar (type <det>) meaning and a vague predicate (type <et>) meaning. The ambiguity is resolved in Russian by the choice of degree morphology: only synthetic degree morphology licenses the scalar meaning.

An alternate way to capture these facts is to argue that all adjectives are born in the lexicon with the same basic meaning. In order to maintain cohesion with the analysis developed for Navajo, we can claim that this basic meaning is a type <ed> expression, while recognizing that there is less evidence from apparent morphological markedness that a type <ed> (rather than <det>) approach is favorable. Let us further claim that in Russian, adjectives are incapable of appearing in the syntax unless they are marked by synthetic degree morphology. There are two synthetic degree morphemes, ER and the covert POS.

The synthetic comparative morpheme ER composes with the type <ed> adjective to convert it into a type <det> expression that composes with a degree-denoting than-phrase. The denotation of ER in (57b) is taken from Kennedy (1999). All adjectives not marked by ER are instead marked by POS. The semantics given for POS are from Kennedy (2007).
To summarize, in Russian, as in Navajo, a degree argument is only licensed by particular degree morphology. In Russian, the licensing morpheme is the synthetic comparative morpheme while it was CA in Navajo. All other adjectives lack a degree argument and are POS-marked vague predicates. In both languages, POS-marked adjectives are, in some sense, the ‘default’ option given their wider distribution. In Navajo, most adjectival verbs can only be POS-marked. In Russian, the only adjectives not marked with POS are marked instead by the synthetic comparative morpheme.

Russian and Navajo are further united in their use of POS-marked adjectives in degree constructions. This characteristic sets Russian and Navajo apart from languages such as English, where POS and all other degree morphemes (MORE, AS, etc.) are in complementary distribution. In both the standard and decompositional models of English, MORE, AS, POS, etc. all compose directly with the adjective. Composition with POS means that the adjective cannot participate in other degree constructions. By contrast, POS-marked adjectives in Navajo and Russian are still available for modification by expressions headed by degree morphemes. The challenge in both languages is determining a semantic analysis that will allow POS-marked forms to be used in degree constructions. I discuss Schwarzschild’s approach at the end of Section 7.3 but save for future work importation of the proposal into a decompositional framework.

7 Contrastivity of Adjectival Verbs: Defining POS

The data and discussion have led us to an analysis of CA morphology that will remain unchanged throughout the rest of the paper. We have not, however, provided an account of POS beyond claiming that it is an expression of type <ed>,<et> >. We were able to make this basic observation by considering contrasts arising between CA-marked adjectival verbs and POS-marked adjectival verbs. We considered POS-marked verbs as a single, unified set. Whether a given POS-marked verb had a CA-marked counterpart or not was irrelevant.

In this section, we will formalize POS by considering patterns in semantic contrasts observed for degree constructions using CA-marked and POS-marked adjectival verbs. We will find that the set of POS-marked verbs contains an additional layer of contrast. If a given verb stem can be both CA-marked and POS-marked (or, is contrastive), then the POS-marked form obligatorily introduces a norm-related interpretation when used in the comparative and equative degree constructions. If a given verb stem can only be POS-marked (or, is noncontrastive), then it does not obligatorily introduce a norm-related meaning to the comparative and equative constructions. Instead, the construction optionally receives a norm-related interpretation that can be cancelled.

To preview the analysis, I will argue that the default interpretation of POS is the semantically vacuous denotation in (58a). The function of POS vacuous is to convert a measure function into a type <et> expression. When the conditions outlined in Section 7.3 are met, POS can be strengthened to the denotation in (58b). POS informative has the same denotation as POS in Kennedy (2007a).

(58) a. \[ \text{POS vacuous}^c = \lambda g_{ed} \lambda x. g(x) = d \]
   b. \[ \text{POS informative}^c = \lambda g_{ed} \lambda x. g(x) > c \]

7.1 Semantic Contrasts for Contrastive Adjectival Verbs

Before examining the semantics of degree constructions containing contrastive POS-marked verbs, we will examine the semantics of these constructions with their CA-marked counterparts. The data in this section can be taken as further evidence in favor of the analysis of CA-marked verbs as scalar, type <et> expressions.

The first degree construction we will examine is the equative construction. There are two ways to form the equative in Navajo, as illustrated in (59). In the construction in (59a) the verb bears the incorporated postposition P-ee ’with P,’ where P is pronominal marking corresponding to the standard of comparison. This construction is only available for CA-marked adjectival verbs. In the construction in (59b), the standard of comparison is marked with the locative enclitic -gi.

In both (59a) and (59b), neither the topic nor standard of comparison must be a tall individual but their heights must be (exactly) equal.

(59) a. Shizhé’é beennéez
   1poss-father 3O-with-nilCA-1sgS-tallCA
   ‘I am as tall as my father’ or ‘My father and I are the same height.’
   b. Nigi áninesnéez
   2sg-LOC ’âniCA-nilCA-1sgS-tallCA
   ‘I am as tall as you’ or ‘You and I are the same height.’
The semantics of (59) is as expected if CA-marked adjectival verbs can participate in constructions invoking abstraction over a degree variable. The standard analysis for the ‘exactly’ equative is shown in (60). As was assumed for MORE in (43), AS takes two predicates of degrees and compares the maximal degree in each set.25

(60) a. I am as tall as you are.
   b. \[-gi\] = \(\lambda Q_d\lambda P_d\) . MAX(P) = MAX(Q)
   c. MAX(\(\lambda d\). I am d-tall) = MAX(\(\lambda d . you\) are d-tall)

The second equative construction is also available for POS-marked adjectival verbs, as shown in (61). In (61), both the topic and standard of comparison are tall relative to a contextual standard. The heights do not have to be as close as in (59b). An alternate paraphrase for (61) is ‘you and I are both tall.’ As shown, the norm-related interpretation is not cancellable. The semantics of (61) follows from an analysis in which nisnee is POS-marked, where POS introduces reference to a contextual standard of comparison.

(61) Nigi ’áťéego nisnee,
     # ’áko ndi doo yeígo nisnee
2sg-LOC 3S-be-SUB ni\(_{POS}\)A-1sgS-\(\theta_{POS}\)A-tall\(_{POS}\)A but NEG very ni\(_{POS}\)A-1sgS-\(\theta_{POS}\)A-tall\(_{POS}\)A

d(a)
NEG
‘I am tall like you, # but I am not very tall.’

Since there is no open degree argument associated with nisnee, the semantics we proposed for the equative in (60) will not suffice for (61). I return to the compositional semantics of (61) in Section 7.3, summarizing the proposal for adverbial degree modification sketched in Schwarzschild (2010).

The comparative construction exhibits a semantic contrast similar to the one observed for the equative construction. The sentence in (62a) can be used in a scenario where my height exceeds the height of my mother, but where neither of us is a tall individual. By contrast, the construction in (62b) can only be used if I am a tall individual and my height exceeds that of my mother. As shown, the norm-related meaning in (62b) is not cancellable. The contrast in semantics is consistent with an analysis in which nisnee is POS-marked, and where POS introduces reference to the contextual standard of comparison.

(62) a. Shimá shideezhi yilááh ’ánisnééz,
     ’áko ndi doo t’áá ’ála yeígo nisnee
d1poss-mother 1-poss-younger.sister 3’O-beyond ’áCA-níCA-1sgS-\(\theta_{CA}\)A-tall\(_{CA}\)A but NEG both very ni\(_{CA}\)A-1sgS-\(\theta_{CA}\)A-tall\(_{CA}\)A

d NEG
‘My mother is taller than my younger sister, but they are both not very tall.’

b. Shimá shideezhi yilááh ’át’éego nineez,
     # ’áko ndi doo
1poss-mother 1poss-younger.sister 3’O-beyond 3S-be-SUB ni\(_{POS}\)A-3S-\(\theta_{POS}\)A-tall\(_{POS}\)A but NEG very ni\(_{POS}\)A-3S-\(\theta_{POS}\)A-tall\(_{POS}\)A

d NEG
‘My mother is taller than my younger sister, # but they are both not very tall.’

At this point, it appears that the semantics in (63) will be sufficient to account for contrasts in truth conditions between constructions with CA-marked and POS-marked adjectival verbs. In the next section, however, we will find that not all POS-marked verbs are obligatorily norm-related, making the denotation in (63) too strong.

(63) \([POS]\)^c = \(\lambda g_{ed}\lambda x . g(x) > c\)

7.2 Absence of Norm-Relatedness for Noncontrastive Adjectival Verbs

When noncontrastive POS-marked verbs are used in the comparative and equative constructions, reference to a contextual standard is a cancellable implicature. This is illustrated by the examples in (64). The same pattern holds for the adjectival verbs in (64) when they appear in the locative enclitic-marked equative construction.26

25 I assume that -gi takes as complement a a CA-marked adjectival verb. This assumption is necessary so that, through Quantifier Raising, we can produce the first type <dt> argument taken by -gi. The verb in the embedded clause is elided under identity with the matrix predicate.

26 Note that in (62) and (64), the modifier yeígo ‘very’ must be used. Speakers consulted felt that omission of ‘very’ made the second clause degraded no matter the semantics of the adjectival verb in the first clause. We must assume that in this context, yeígo does not actually contribute
a. Shideezhí shádi yilááh át’éego nizhóní, áko ndi lposs-younger.sister lposs.older.sister 3’O-beyond 3S-be-SUB niPOS∅-3S-∅POS∅ prettyPOS∅ but 
doo t’áá ála yeigo nizhóní da 
NEG both very niPOS∅-3S-∅POS∅ prettyPOS∅ NEG 

‘My younger sister is prettier than my older sister, but they are both not very pretty.’

b. Shiwáán nivaán yilááh át’éego dilchxosh, áko ndi doo lposs-wine 2poss-wine 3’O-beyond 3S-be-SUB (niPOS∅)-3S-∅POS∅-bubblyPOS∅ but NEG 
t’áá ála yeigo dilchxosh da 
both very (niPOS∅)-3S-∅POS∅-bubblyPOS∅ NEG 

‘My wine is more bubbly than your wine, but they are both not very bubbly.’

c. Tacomadi kééhash’tįgi yilááh át’éego deesdoi, áko ndi doo t’áá ála yeigo Tacomadi-LOC 2sgS-reside-COMP 3’O-beyond 3S-be-SUB 3S-hotPOS∅ but NEG both very deesdoi da 
3S-hotPOS∅ NEG 

‘Tacoma is hotter than where you live, but they are both not very hot.’

Before considering the implications of these data for POS, we will review what is meant by ‘noncontrastive’ adjectival verbs. If we define the class based on the availability of CA-marking, then (64a) appears to contain a contrastive verb: the CA-marked counterpart of nizhóní is ánóoshóní. Recall from previous discussion, however, that this form is among the CA-marked verbs that were not used frequently in elicited Navajo examples, nor were they attested frequently in the dictionary. In addition, speakers were unsure of the acceptability of the CA-marked forms ánóoshóní ‘pretty’ and ‘ádóó-tlééé’ ‘wet’. While the Young and Morgan dictionary appears to be an overall accurate account of the morphology and syntax of adjectival verbs and degree constructions in Navajo, it is worth noting that lexical entries come from sources produced between 1910 and 1974 (Young and Morgan 1987: g5). It is not unexpected that forms that may have been marginal to begin with have fallen into disuse.

For this reason, I argue that despite the existence of CA-marked forms, adjectival verbs like nizhóní fall into the ‘noncontrastive’ category. As such, they are not predicted to pattern any differently from verbs that completely lack CA-marked counterparts, such as dilchxosh ‘bubbly’ and deesdoi ‘hot’. The generalization, then, is noncontrastive POS-marked verbs can receive a norm-related interpretation in the comparative and equative constructions. However, the norm-related implicature can be felicitously cancelled. This is in contrast with the observations made for contrastive POS-marked verbs in Section 7.1, where degree constructions containing POS-marked verbs were obligatorily norm-related. Focusing only on the data presented for noncontrastive verbs, it appears that the denotation of POS in (65) will be sufficient.

(65) \[ \text{POS}^\circ = \lambda g_{ed}\lambda x.g(x) \]

An alternate way to capture the data in this section is to claim that we have misanalyzed noncontrastive ‘POS’-marked verbs. Assuming only the meaning of POS in (63), we might claim that the verbs in this section are not POS-marked at all, but are instead type <det> expressions that lack CA morphology. This approach falls short in three ways. First, it would damage our account of CA as the sole licensor of scalar, type <det> semantics. This account proved successful in previous sections. Second, we saw extensive syntactic evidence in Section 4 that both contrastive and noncontrastive POS-marked adjectival verbs pattern identically. Both types of verbs pattern syntactically as intransitive expressions. Third, it is not the case that a norm-related reading is always absent for POS-marked adjectival verbs. Rather, it is the case that the norm-related reading is available - and perhaps even preferred - but is not obligatory, as it was for contrastive POS-marked verbs. In response to the shortcomings of such a proposal, I discard it in favor of viewing all adjectival verbs not marked by CA as being POS-marked expressions.

\[a \text{ high degree interpretation to the adjectival verb (i.e., the proposition ‘they are both pretty (minimally exceeding a contextual standard’ is being negated, not ‘they are both pretty (to a high degree)’). Two problems will arise if yeígo contributes a high-degree interpretation. First, in (64), the felicity of the second clause would not tell us that POS is semantically vacuous in the first clause. It is possible not to be ‘pretty (to a high degree)’ while still being ‘pretty (minimally exceeding a contextual standard’.) Second, in (62b), infelicity of the second clause is unexpected. Even if POS imposes a norm-related reading on the first clause, it should be possible for the two individuals to be ‘tall (minimally exceeding a contextual standard’ while not being ‘tall (to a high degree).’\]

In support of the assumption that yeígo does not contribute a high degree interpretation to the adjectival verb in this context, I provide the following observation. It is possible in English to make a statement of the form in (1).

(1) Sandy is taller than Jane, but Sandy is not particularly tall.

According to my intuitions, the truth conditions of the second clause are not ‘it is not the case that Sandy is tall to an especially high degree.’ Rather, the second clause has the meaning ‘it is not the case that Sandy is tall in minimal excess of a contextual standard.’ In other words, while the statement ‘Sandy is particularly tall’ clearly means that Sandy is tall to a high degree, ‘particularly’ does not necessarily have a high degree interpretation in the negation of the statement. Furthermore, I would find the second clause of (1) to be slightly degraded in the absence of ‘particularly’ or another ostensibly ‘high degree’ modifier (e.g., ‘very’, ‘especially’).
7.3 Defining POS

In this section, we will consider the data from Sections 7.1 and 7.2. Focusing first on the data from Section 7.2, it must be the case that POS can receive a non-norm-related interpretation. I propose that this semantically uninformative meaning is the basic meaning of POS, repeated in (66). POS produces a type <et> expression through composition with the type <ed> verb stem but does not relate the degree produced by the measure function to the contextual standard.

\[(66) \quad [\text{POS}_{\text{vacuous}}]^c = \lambda g_{ed} \lambda x \exists d.g(x) = d\]

There is also a semantically informative form of POS, with the denotation in (67).

\[(67) \quad [\text{POS}_{\text{informative}}]^c = \lambda g_{ed} \lambda x.g(x) > c\]

I remain agnostic as to whether POS_{informative} and POS_{vacuous} exist in the lexicon as separate entries or whether POS_{vacuous} is derived from POS_{vacuous}. An analysis in which a single POS morpheme has the basic meaning of POS_{vacuous} but can be strengthened to POS_{informative} under particular circumstances seems preferable on grounds of parsimony. However, the facts described below are more clearly captured if we view POS_{informative} and POS_{vacuous} as two separate morphemes that can, in theory, compose with any adjectival verb. The distribution of POS_{vacuous} is restricted based on the semantic conditions in (68).

\[(68) \quad \text{a. Avoid vacuity of meaning.} \]
\[\text{b. Avoid identity of truth conditions.}\]

According to the first condition, ‘Avoid Vacuity,’ only the POS_{informative} interpretation is available if preservation of POS_{vacuous} would result in a meaningless statement, as in (69).

\[(69) \quad \text{Shideezhí nizhóní} \]
\[\text{1poss-younger.sister niPOS}_{A}-3S-\emptyset POS_{A} \]
\[\text{‘My younger sister has a degree of prettiness.’}\]

The POS_{vacuous} interpretation can be preserved if the adjectival verb is further modified by an adverbial degree expression. In (70), the verb is permitted to maintain its non-norm-related interpretation because modification by the degree expression has made it a non-vacuous statement:

\[(70) \quad \text{Shideezhí shádí yilááh ’at’éego nizhóní} \]
\[\text{1poss-younger.sister 1-poss.older.sister 3’O-beyond 3S-be-SUB niPOS}_{A}-3S-\emptyset POS_{A} \text{-pretty POS}_{A} \]
\[\text{‘My younger sister is prettier than my older sister’ or: ‘My younger sister has a degree of prettiness that equals the degree to which my older sister is pretty.’}\]

Moving on to the second condition, ‘Avoid Identity,’ the POS_{vacuous} interpretation is also blocked where its preservation would give rise to a sentence with truth conditions identical to another, preferred sentence. If the verb nišneez in sentence (71b) received a non-norm-related interpretation, the sentence would be true just in case my height exceeds the height of my mother. The same truth conditions appear to hold of sentence (71a).

\[(71) \quad \text{a. Shimá bilááh ’ánisnéez} \]
\[\text{1poss-mother 3O-beyond ’áC}_{A}-niC}_{A}-1sgS-\emptyset C}_{A}-\text{tall}_{C}_{A} \]
\[\text{‘I am taller than my mother.’}\]
\[\text{b. Shimá bilááh ’át’éego nišneez} \]
\[\text{1poss-mother 3O-beyond 3S-be-SUB niPOS}_{A}-1sgS-\emptyset POS_{A} \text{-tall POS}_{A} \]
\[\text{‘I am taller than my mother.’}\]

One possible question at this juncture is that while the sentences in (71) appear to be truth-conditionally equivalent, the derivation of these truth conditions are not the same. Since POS-marked adjectival verbs never have a degree argument over which abstraction can occur, the semantics of (71b) are necessarily different from the semantics of (71a). Schwarzschild (2010) sketches one possible account of the semantics of (71b). Schwarzschild argues that the POS morpheme introduces a variable D that ranges over the domain of degrees. Adverbial degree expressions are adverbial predicates of the domain of POS, ranging over values of D (i.e., of type <dt>) and restrict the range of values in D.\(^{27}\)

\[\text{Schwarzschild provides the following semantics for POS:} \]

\[(1) \quad [\text{POS}]^c = \lambda D_R \lambda D \exists d(d \in D_R \land d \in D) \land \forall d(d \in D_R -> d > \text{standard-in-c}(d))\]
Under Schwarzschild’s account, the degree argument \( d \) of the CA-marked verb in (71a) is directly manipulated while in (71b), the domain variable \( D \) is manipulated. For now, we will stipulate that the two sentences in (71) are, in fact, truth-conditionally equivalent if POS in (71b) does not introduce norm-relatedness. The condition ‘Avoid Identity’ applies and POS obligatorily receives the norm-related, ‘strong’ interpretation.

We may also ask why it is the non-norm-related interpretation of (71b) that is excluded. In other words, why is the form in (71a) preferred? At this time, we can make the following stipulation to describe - if not explain - these data:

(72) Given two semantically equivalent structures, prefer a structure that manipulates the degree argument \( d \) rather than the domain variable \( D \).

Our revised analysis for POS hinges on the distinction between contrastive and noncontrastive adjectival verbs. If a POS-marked verb has a CA-marked counterpart (or, is contrastive), then the POS-marked verb always receives the norm-related POS \(_{informatve} \) interpretation. If a POS-marked verb does not have a CA-marked counterpart (or, is non-contrastive), then the POS-marked verb can receive either the POS \(_{vacuous} \) or POS \(_{informatve} \) interpretation, modulo the effects of the condition ‘Avoid Vacuity.’

The concepts of contrastive pairs and semantic competition has already proved valuable in the work of Rett (2008). As discussed at the end of Section 5, Rett argues that the interrogative and equative degree constructions obligatorily contain EVAL just in case the absence of EVAL would produce two constructions with the same truth conditions. In other words, the distribution of EVAL is determined in part by the condition ‘Avoid Identity’. Furthermore, Rett must invoke the concept of a marked member of pairs of contrastive adjectives. For Rett, the relevant contrast is between negative-polar and positive-polar dimensional adjectives. The negative-polar member is marked. Given two constructions that would otherwise be truth-conditionally equivalent in the absence of EVAL (e.g., ‘Sandy is as short as Jane’ and ‘Sandy is as tall as Jane’), it is the construction with the negative-polar adjective that obligatorily contains EVAL. For our purposes, the relevant contrast is between pairs of CA-marked verbs and their POS-marked counterparts. I have argued that the CA-marked verb is the unmarked, preferred member of the pair.

To this point, we have considered the semantics of comparative and equative constructions with contrastive and non-contrastive adjectival verbs. We found that in both constructions, contrastive verbs obligatorily contributed a norm-related interpretation while norm-relatedness could be cancelled when a noncontrastive verb was used. A small puzzle for the analysis developed in response to these data is that no matter whether a POS-marked verb is contrastive or noncontrastive, the interrogative construction always receives a norm-related interpretation. Relevant data are found at the end of Section 5 and are repeated below:

(73) a. Haa yit’éego deesdoi?
   WH 3S-be-SUB 3S-hot\(_{POSu}\)
   ‘How hot is it?’ (Possible answers: ‘very/not very hot,’ ‘hot for Phoenix’)

b. Haa yit’éego náshzhoh?
   WH 3S-be-SUB 3S-moist\(_{POSu}\)
   ‘How moist is it?’ (Possible answers: ‘very/not very moist,’ ‘moist for cake’)

c. Haa yit’éego nichxon?
   WH 3S-be-SUB n\(_{POSu}\)-3S-stinky\(_{POSa}\)
   ‘How stinky is it?’ (Possible answers: ‘very/not very stinky,’ ‘stinky for a cheese’)

The semantics for an adverbial degree expression are as shown below:

(2) \[ [\text{you AT}]^c = \lambda D. \text{your-height} \in D \]

When (2) composes with a POS-marked adjectival verb such as nisneeż ‘I am tall’, both POS and the degree expression impose restrictions on \( D \). The truth conditions of the entire adverbial equative construction in (3a) are as shown in (3b).

(3) a. Nigi ’at’éego nisneeż
    ‘I am tall like you.’

b. \( D \) is a set of heights that includes your height. All heights in \( D \) exceed the contextual standard of comparison and they also include my height.

The primary challenge for Schwarzschild’s system is that no matter the semantics (<det> or <et>) of the matrix predicate, the embedded, elided predicate must be of type <det> in order to derive the semantics of expressions like (2). Schwarzschild seems to assume that the elided expression is a (type <det>) verb stem rather than a fully inflected verb. However, this assumption has two shortcomings. First, Schwarzschild assumes that a subset of adjectival verb stems (i.e., those found in ‘unmarked’ adjectival verbs, e.g., deesdoi ‘it is hot’) are inherently POS-marked. As a result, there is no point at which these adjectival verbs could potentially be expressions of type <det>. Second, while I did not elicit any examples of adverbial degree expressions containing non-elided POS-marked adjectival verbs, Young and Morgan (1987) contains one example of a full verb yáshti ‘I talk’ occurring inside of an adverbial degree expression. This sheds uncertainty on the proposal that this site always contains (unpronounced) verb stems.
One response to these data is to claim that interrogative constructions with adjectival verbs exhibit presuppositional effects attested for better-studied interrogative constructions, as discussed by Karttunen (1977). The question in (74) presupposes the existence of an individual such that the individual saw Harry.

(74) a. Who saw Harry?
   b. Presupposes: ∃x.x saw Harry

In constructions like those in (73), then, the presupposition of norm-relatedness would be due to the influence of the wh-construction (i.e., in order to question the degree to which an adjectival verb holds, we must assume that it does hold to a salient degree) rather than due to the semantics of POS.

A second possible response is that in contrast with other degree constructions, interrogative constructions do not provide any additional information about the semantics of the adjectival verb. As a result, when POS-marked adjectival verbs are used in the interrogative construction, the construction would still violate ‘Avoid Vacuity’ if POS_informative is not used. I leave further exploration of this issue to future work.

8 Conclusions and Further Research

In this paper, I have argued that a scalar, type <det> meaning is only licensed for Navajo adjectival verbs marked by CA morphology. CA has the denotation in (75).

(75) [CA] = λg ed, λd, λx. g(x) ≥ d

The restriction of type <det> meaning to CA-marked adjectival verbs was supported with data from morphology, syntax, and semantics. CA-marked adjectival verbs bear a valence marker indicating a transitive argument structure. They are obligatorily modified by a degree expression subject to locality conditions more restrictive than observed for adverbial modifiers. By contrast, POS-marked adjectival verbs behave like intransitive expressions and are optionally modified by degree expressions bearing markers of adverbialization. Furthermore, only CA-marked adjectival verbs are permitted in degree constructions involving abstraction over a degree argument.

I also proposed that all adjectival verbs not marked for CA are POS-marked. In Navajo, POS has a very wide distribution and does not always contribute a norm-related meaning. As a result, I posited that the basic meaning of POS is as in (76). The function of POS_vacuous is to convert the type <ed> verb stem into an expression of type <et>.

(76) [POS_vacuous] = λg ed, λx. ∃d. g(x) = d

Under certain circumstances, POS receives the interpretation in (77).

(77) [POS_informative] = λg ed, λx. g(x) > c

POS must have the interpretation of POS_informative in order to meet the conditions of ‘Avoid Vacuity’ and ‘Avoid Identity.’ In response to ‘Avoid Vacuity,’ POS is given a norm-related interpretation when further information about a POS-marked adjectival verb is not provided by an adverbial degree expression. In response to ‘Avoid Identity,’ POS is given a norm-related interpretation when a construction with a POS-marked verb would otherwise have the same truth conditions as a competing form. I assumed that given semantic competition between a degree construction with a CA-marked verb and its POS-marked counterpart, the construction with the CA-marked form is preferred.

This analysis has several consequences, both theoretical and typological. First, Navajo empirically supports the decompositional analysis presented by Kennedy (1999) over the standard analysis, which assumes all adjectives to have a scalar, type <det> semantics. In Navajo, a scalar semantics is only licensed in the presence of CA, morphology that is not only more complex than POS but which also has a highly restricted distribution. A similar pattern was discussed for Russian, where a scalar semantics is licensed by the synthetic comparative morpheme.

Second, this paper demonstrated that many - if not most - adjectives used in degree constructions are POS-marked, type <et> expressions. These constructions were surprising in Navajo. While they exhibited syntactic evidence of the verb being POS-marked, the equative and comparative constructions were not obligatorily norm-related for adjectival verbs lacking CA-marked counterparts. Several aspects of POS-marked adjectival verbs used in degree constructions are deserving of further attention. For example, how do adverbial degree expressions modify POS-marked adjectival verbs? While the proposal in Schwarzschild (2010) succeeded in capturing the truth conditions for these constructions, the proposal has several potential shortcomings, as discussed above. The use of similar constructions in Russian underscores the need for further work on the semantics of adverbial degree modification, particularly as more examples of this class of expressions are attested cross-linguistically.

In addition, the semantics of POS proved more complex than expected in Navajo. While previous analyses of POS have uniformly treated the morpheme as introducing comparison to a contextual standard, it appears that this meaning alone cannot capture the semantics of POS-marked verbs in Navajo.
Finally, we saw that CA morphology is largely restricted to dimensional adjectival verbs. As a result, it is largely dimensional adjectival verbs that are permitted as scalar semantics. The dimensional vs. non-dimensional distinction was also important to our discussion of contrastive and noncontrastive adjectival verbs. I argued that only dimensional adjectival verbs are truly contrastive, having both CA-marked and POS-marked forms that are used frequently. It appears that Navajo reinforces the observations made in Bierwisch (1989), Rickheit (1989), and Schwarzschild (2010) that dimensional adjectives have a semantics distinct from non-dimensional adjectives, and behave differently with respect to modification by degree expressions. The effect of dimensional vs. non-dimensional status on the distribution of CA morphology in Navajo represents one more way in which adjectives from the two classes may be found to pattern differently cross-linguistically.

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