

Gradability and Degree Constructions in Navajo

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Elizabeth Bogal-Allbritten

Abstract

The relational analysis of gradable predicates and degree constructions posits that all gradable predicates are of type $\langle d, et \rangle$ and that degree morphology introduces the ordering between topic and standard of comparison. While well supported by data from many languages, the relational analysis is shown in this thesis not to adequately account for data from Navajo. Drawing on extensive data from Navajo gradable predicates and degree constructions, it is shown that alternation in degree morphology determines the semantic type of gradable predicates ($\langle d, et \rangle$ vs. $\langle et \rangle$) while standard markers introduce the ordering relation. The syntax and semantics of degree constructions using both types of predicates are considered in detail. The most tenable analysis of the Navajo data builds on a recent proposal by Kennedy (2007a) in which standard markers introduce the semantics of the degree construction while degree morphology has a greatly reduced role, serving only to determine the type of the predicate. Not only does this analysis account for the Navajo data but it also accounts for ‘problematic’ aspects of degree constructions in other languages.

Introduction

This thesis seeks to address two broad questions. First, how is gradable adjectival meaning expressed in Navajo, and how are gradable, adjectival predicates used in degree

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The following abbreviations will be used in the glosses: EVID = evidential marker; FOC = focus marker; TOPIC = topic marker; BEYOND = postposition *-lááh* ‘beyond’; SHORT OF = postposition *-’oh* ‘short of’; WITH = postposition *-’ee* ‘with’; WITH = postposition *-’it*; AT = locative enclitic *-’gi* ‘at’; LOC = locative enclitic (*-’di*, *-’ji*); SUB = adverbializer/subordinator/complementizer *-’go*; COMP = complementizer/nominalizers *-’i* and *-’ígíí*; NEG = negative marker; NOM = nominalizer; UNSPEC = indefinite or unspecified person. 1,2,3,3’ = person marking; sg, dpl, pl = number marking; QPRT = question particle (*-’sh*, *lá*, *shá*’); WH = *wh*-word; P = Perfective mode; I = Imperfective mode; F = Future mode. Pages from the grammar section of Young and Morgan (1987) are indicated as g###, while pages from the dictionary section are indicated as d###. The semantic interpretations discussed in this paper use the following variables:

Type	Variable name	Example
$\langle ed \rangle$	s, m	δ_{tall}
$\langle d, et \rangle$	g	tall, fast, heavy
$\langle e \rangle$	x,y,z	Sally, Anna, <i>shí</i> ‘I’, <i>shimá</i> ‘my mother’

constructions? Second, what are the implications of these findings for the standard view of gradable predicates and degree constructions?

Section 1 introduces this standard view, the relational analysis of gradable predicates. The relational analysis maintains that a gradable predicate (e.g., *tall*) takes a degree as one of its arguments. I briefly outline the three methods of saturating the degree argument under the relational analysis: direct saturation by a degree-denoting measure phrase (e.g., *6ft*), semantic restriction by a degree morpheme (e.g., *more/er*), and comparison of the degree argument to a contextual standard of comparison (e.g., *I am tall*). The section closes with consideration of what typological features in a given language X would not be satisfactorily treated by the relational analysis.

Section 2 details the appearance and interpretation of gradable predicates and degree constructions as found in Navajo. The section opens with a brief introduction to points of Navajo morphology and syntax that will play a substantial role in later discussion. Next, I sketch the syntax of degree constructions in Navajo, exemplifying comparative (*X is more A than Y*), equative (*X is as A as Y*), *wh*-word (*How A is X?*), measure phrase (*X is 6ft A*), and high-degree (*X is very A*) constructions. Navajo expresses comparative and equative meaning by marking the standard of comparison (Y) with a directional or locative postposition, a cross-linguistically common method. I then focus on the morphology of gradable predicates used in these degree constructions, considering the distribution of two sets of derivational prefixes, *ni*⁻⁶ and (*á*)-*ni*⁻².² Gradable predicates marked by *ni*⁻⁶ are said to be in the ‘absolute aspect,’ while predicates marked with (*á*)-*ni*⁻² are in the ‘comparative aspect’ (Young & Morgan 1987: g192). In the remainder of the section, I demonstrate that *ni*⁻⁶-marked predicates behave as positive-marked

² Superscript numerals (e.g., 6 and 2) are used in Young and Morgan (1987) to distinguish between prefixes of the same shape that occupy the same position in the Navajo verb template (c.f. §2.2).

predicates of type $\langle et \rangle$, lacking an open degree argument, while ($'á$)- ni^{-2} -marked predicates behave as type $\langle d,et \rangle$ expressions, the semantic type of all gradable predicates under the relational analysis. I argue that ni^{-6} and ($'á$)- ni^{-2} are degree morphemes of a more general variety than found in English.

In Section 3, I place the facts about Navajo gradable predicates and degree constructions in the context of a new theoretical analysis. I argue that the relational analysis is untenable for Navajo for three reasons. First, most Navajo predicates behave as expressions of type $\langle et \rangle$ and not $\langle d,et \rangle$. Second, given that both types of predicates are equally derived, it is untenable to claim type $\langle d,et \rangle$ predicates as basic, as supposed by the relational analysis. Finally, the relational analysis is not equipped to handle a language in which both degree morphology and standard markers are semantically non-vacuous. I argue that the Navajo data strongly support a recent proposal by Kennedy (2007a) in which degree morphology (cross-linguistically, not just in Navajo) determines the semantic type of the gradable predicate, while the standard marker introduces the ordering relation.

Section 4 applies the analysis discussed in Section 3, introducing the syntax and semantics of a selection of degree constructions in Navajo. I argue that Functional Application is the operative process in degree constructions utilizing ($'á$)- ni^{-2} -marked (type $\langle d,et \rangle$) predicates. This section also introduces the semantics of degree constructions that utilize ni^{-6} -marked (type $\langle et \rangle$) predicates. For these constructions, I argue for an analysis in which Predicate Modification is the operative compositional operation. This section also provides an account of $'át'éego$, the subordinate copula that obligatorily appears in degree constructions utilizing ni^{-6} -marked predicates.

1. Gradable predicates and degree constructions

1.1: Introduction

This section outlines the definitions and views that have been most frequently adopted in the rich literature on gradable predicates and degree constructions. I refer to these views collectively as the relational analysis. Throughout Section 1, data from non-Indo-European languages will be considered. As will be seen, the relational analysis successfully accounts for much of these data: even where the framework of the analysis must be altered slightly, the fundamental assumptions still stand. I close the section with a consideration of what sort of data from a hypothetical language X would pose a stronger challenge to the relational analysis, concluding that the strongest challenge would be posed by a language X that has both degree morphology and non-vacuous standard markers.

1.2: Fundamentals of gradable predicates

Intuitively, when a speaker makes a claim about an object involving a GRADABLE PREDICATE (e.g., *tall*, *clever*, *light*, *musty*) the speaker is relating this object to a set of other objects. Gradable predicates may be differentiated from non-gradable predicates (e.g., *alive*, *former*, *Polish*, *triangular*) in two ways. First, gradable predicates are “order inducing, in the sense that we can impose an ordering (possibly incomplete) on objects according to whether one object possesses the relevant property to a greater or less extent than another” (Klein 1991: 673). This ordering may be overtly specified by the speaker, e.g., ‘The green block is *heavier* than the yellow ball.’ A set may also be non-explicitly compared to a second set of relevant common nouns. A proposition such as ‘The green block is heavy’ is EVALUATIVE, requiring that the green block be heavier than the average weight of a set of relevant objects or toys, but does not explicitly name this set. Formalizing these intuitions, we can say that when a speaker describes an object in terms of a gradable predicate, the speaker is making reference to a SCALE, which

Kennedy formalizes as an “abstract representation...of the amount to which an object possesses some gradable property...a dense, linearly ordered set of points, or ‘degrees,’ where the ordering is relativized to a dimension” (Kennedy 1997: 51). The DIMENSION - e.g., *width, height, weight, shade, roundness* - is contributed by the gradable predicate.

Second, gradable predicates may be used in DEGREE CONSTRUCTIONS, defined broadly as any morphosyntactic construction involving a DEGREE MORPHEME used to “make reference to a degree of gradability or a degree of quantity” (Rett 2008: 1). In other words, the ability of a predicate to appear felicitously in a degree construction confirms that it is a gradable predicate (Klein 1991). In (1), gradable predicates are shown occurring felicitously in degree constructions, while nongradable predicates cannot occur in degree constructions. The degree morphemes are italicized.

(1)

<u>Gradable Predicates</u>	<u>Nongradable predicates</u>
<i>how</i> tall?	## <i>how</i> former?
<i>more</i> clever	## <i>more</i> alive
<i>tallest</i>	## <i>most</i> triangular
<i>as</i> musty	## <i>as</i> Polish
<i>very</i> light	## <i>very</i> triangular

(adapt. Kennedy 1997: 1)

The examples in (2) demonstrate that degree constructions are cross-linguistically built from similar components, although ordering of these components may vary. The headings given for each example will be used throughout this thesis to refer to the components of degree constructions. Below, (2a,b) illustrate the comparative and equative degree constructions in English. For contrast, examples (2c) and (2d) show degree constructions in Hindi-Urdu and Japanese. For English and Hindi-Urdu, the standard marker is proposed to be semantically vacuous. In Japanese, the standard marker is a morpheme expressing location or direction and

the degree morpheme is never overt. Other languages that utilize directional or locative standard markers and null degree morphology include Maasai and Latvian (Klein 1991, Stassen 1985).

- (2)
- | | | | | | |
|----|--|---|---|---|---|
| a. | TOPIC OF
COMPARISON
Sally
'Sally is taller than Anna.' | GRADABLE
PREDICATE
(is) tall | DEGREE
MORPHEME
-er | STANDARD
MARKER
than | STANDARD OF
COMPARISON
Anna. |
| b. | TOPIC OF
COMPARISON
Max
'Max is as tall as Sally.' | DEGREE
MORPHEME
(is) as | GRADABLE
PREDICATE
tall | STANDARD
MARKER
as | STANDARD OF
COMPARISON
Sally. |
| c. | TOPIC OF
COMPARISON
<i>John</i>
J.
'John is taller than Bill.' | STANDARD OF
COMPARISON
<i>Bill</i>
B. | STANDARD
MARKER
-se
than | DEGREE
MORPHEME
<i>zyadaa</i>
more | GRADABLE
PREDICATE
<i>lambaa hai.</i>
tall is
(Bhatt & Takahashi 2007: 2) |
| d. | TOPIC OF
COMPARISON
<i>sato-wa</i>
village-TOP
'The village is nearer than the river.' | STANDARD OF
COMPARISON
<i>kawa</i>
river | STANDARD
MARKER
<i>yori</i>
from | DEGREE
MORPHEME
\emptyset | GRADABLE
PREDICATE
<i>chikashii</i>
near |
- (Klein 1991: 676; cited from Stassen 1985)

1.3: The relational analysis of gradable predicates

The RELATIONAL ANALYSIS of gradable predicates and its formal ontology of scales, dimensions, and degrees, is the most widely held formalization of the intuitively relational sense of gradable predicates. This theory may be traced back to Cresswell (1976) and has since been discussed by von Stechow (1984), Heim (1985, 2000), Bierwisch (1989), Klein (1991), Kennedy & McNally (2005), and Schwarzschild (2005), among many others. While individual authors vary with respect to particular details of the relational analysis, the following summary captures the primary points shared by the aforementioned authors.

A proposition of the form x is g (e.g., 'Sally is heavy') is taken to have the form and truth conditions given in (3).

- (3) a. X is g .
 b. $\|g_{\langle d,et \rangle}(x,d)\| = 1$ iff $\delta_g(x) \geq d$

I join the aforementioned authors in adding the degree $\langle d \rangle$ to the inventory of basic semantic types. In (3), x is an individual, g is any gradable predicate (a function from degrees to properties of individuals, type $\langle d,et \rangle$), d is a degree, and δ_g is a measure function (type $\langle e,d \rangle$) that maps individual x to a scale related to g , returning a degree. The form in (3b) can be expressed as x is g just in case the degree returned by the measure function is at least as great as d (Kennedy 1997: 53).

Thus, any sentence of the form x is g is a relation between two degrees: first, the degree produced by applying the measure function δ_g to an individual x ; second, the degree argument d . This degree argument d is valued in different ways depending on the particular degree construction used. In this analysis, the two degrees associated with gradable predicate g are always related by the partial ordering relation \geq . Accordingly, Heim writes that a sentence with a gradable predicate is “hierarchically structured and compositionally interpreted just like an ordinary transitive sentence. The [predicate’s] degree argument appears to be syntactically projected just like the individual argument” (2000: 214). Similarly, Klein writes, “gradable adjectives are predicates, parameterized for a degree” (1991: 680). The ability of this degree argument to be bound by functional degree morphology indicates that the degree argument is a non-thematic argument, like the event, modal, and temporal arguments (Schwarzschild 2005).

The form associated with the gradable predicate *heavy* is given in (4). The gradable predicate *heavy* $\langle d,et \rangle$ first composes with a degree (or a morpheme that gives the degree value) to produce a property of individuals $\langle et \rangle$. This property then composes with an individual x to produce a proposition $\langle t \rangle$.

- (4) $\|heavy_{\langle d,et \rangle}(x,d)\| = \lambda d \lambda x. \delta_{heavy}(x) \geq d$

When taken in isolation, a gradable predicate like *heavy* is uninformative: the listener must ask, *heavy* to what degree? The degree argument d can be saturated in one of three primary ways: (i) direct saturation by a measure phrase; (ii) semantic restriction by degree morphology; and (iii) relation to a contextual standard of comparison in the positive construction.

1.3.1: The measure phrase

First, the gradable predicate may compose directly with a degree-denoting measure phrase, such as *5ft*. Following von Stechow (1984), I assume that a measure phrase denotes a degree such that it can saturate d directly. Composition of *tall* and *5ft* produces a property of individuals $\langle et \rangle$, which then composes with an individual as shown in (5d). This proposition is true just in case that Sally's degree of tallness (the degree produced when the measure function δ_{tall} is applied to Sally) is at least as great as 5ft, the value of the degree argument.

- (5) a. Sally is 5ft tall.
 b. $tall_{d,et}(x)(d) = \lambda d \lambda x. \delta_{\text{tall}}(x) \geq d$
 c. $tall_{d,et}(x)(5ft) = \lambda x. \delta_{\text{tall}}(x) \geq 5ft$
 d. $tall_{d,et}(\text{Sally})(5ft) = 1$ iff $\delta_{\text{tall}}(\text{Sally}) \geq 5ft$

1.3.2: Overt degree morphology

The second method of assigning value to the degree argument d under the relational analysis is by semantically restricting the possible value(s) of d by placing it in an ordering relation with a second degree. This is the function accomplished by the degree morphemes *more/er*, *less*, and *as*. A degree construction featuring *more/er* is given in (6).³

³ Throughout this thesis, I will make reference to the maximality operator *max*, following von Stechow (1984), Rullman (1995), Kennedy (2007a,b), among others. From now on, if a semantic interpretation uses the maximality operator, I will mark it only as *max* with the full interpretation as given in (6b).

- (6) a. Sally is taller than Anna.
 b. $tall_{\langle d,et \rangle}(x)(d) = \lambda d \lambda x. \delta_{tall}(x) \geq d$
 c. $\|more/er\| = \lambda y \lambda g_{\langle d,et \rangle} \lambda x. \max \{d' \mid g(d')(x) = 1\} > \max \{d'' \mid g(d'')(y) = 1\}$
 Or simply: $\lambda y \lambda g_{\langle d,et \rangle} \lambda x. \max(g)(x) > \max(g)(y)$ (Kennedy 2007a)
 d. $\max(\lambda d'. tall(Sally) \geq d') > \max(\lambda d''. tall(Anna) \geq d'')$
 The degree d' to which Sally is d' -tall is greater than the degree d'' to which Anna is d'' -tall.

As shown in (6c), the degree morpheme *more/er* first composes with y , an individual of type $\langle e \rangle$ corresponding to the standard of comparison (the complement of the semantically vacuous standard marker *than*). It then composes with a gradable predicate g of type $\langle d,et \rangle$. As per the interpretation of *more/er*, g is inserted in two places: once such that it applies to individual y and once such that it applies to individual x . It then composes with x , a second individual of type $\langle e \rangle$ corresponding to the topic of comparison. The final product of composition is shown in (6d). When the gradable predicate *tall* applies to *Sally* and *Anna*, each application of the predicate brings with it a degree argument. These two degree arguments are referred to respectively as d' and d'' . The degree morpheme *more/er* imposes an ordering relation on d' and d'' , such that $d' > d''$. The exact ordering relation varies based on the degree morphology. If the proposition were instead *Sally is as tall as Anna*, the degree morpheme *as* would impose the relation $d' = d''$. Similarly, in the proposition *Sally is less tall than Anna*, the degree morpheme *less* imposes the relation $d' < d''$. Once the value of both degree arguments has been restricted in this way, neither degree argument is available for further valuation later in the derivation.

1.3.3: The (non-overt) positive morpheme

The third method of assigning a value to degree argument d is through comparison of d to a contextual standard of comparison. The (null) *pos* morpheme restricts the degree argument d to values exceeding a contextual standard of comparison s . As expressed formally in (7d), the

proposition *Sally is tall* is true just in case there exists a degree d such that Sally is at least d -tall, and d is greater than s .

- (7) a. Sally is tall.
 b. $tall_{d,et}(x)(d) = \lambda d \lambda x. \delta_{tall}(x) \geq d$
 c. $||pos|| = \lambda g \lambda x \exists d. g_{d,et}(x, d) \wedge d > s$ (adapt. Cresswell 1976)
 d. $tall(Sally)(d)[(pos)] = \exists d[\lambda x. \delta_{tall}(Sally) \geq d] \wedge [d > s]$

The exact method of calculating s varies: von Stechow proposes that d must exceed the average degree $[s]$ to which a set of relevant common nouns (a ‘comparison class’) exhibits a given adjectival property (1984: 60). Kennedy defines s as a “context-sensitive function that chooses a standard of comparison in such a way as to ensure that the objects that the positive form is true of ‘stand out’ in the context of utterance relative to the kind of measurement that the adjective encodes” (2007b: 17). In both analyses, the truth of (7a) varies based on the utterance context: if Sally is a third grader, the degree to which Sally must be tall is a good deal lower than the degree of tallness a giraffe named Sally would have to exhibit in order to be considered tall relative to other giraffes.

In English, the standard of comparison introduced by *pos* may be overtly indicated with a *for*-phrase, as shown in (8) (Klein 1991: 685; Kennedy 1997, 2007b). Once *pos* has bound the degree argument of a gradable predicate, the degree argument is no longer available for further valuation through composition with material that would saturate the degree argument, such as the measure phrase in (8b).

- (8) a. Sally is tall for a third grader.
 b. #?Sally is 5 feet tall for a third grader. (adapt. Kennedy 1997: 131)

1.4: Challenges to the relational analysis

The first challenge faced by the relational analysis is the cross-linguistic paucity of degree morphology relative to standard markers. In his extensive survey of modes of

comparison, Stassen found that out of 110 languages, only 38 marked comparative degree with either bound or analytic morphology (Stassen 1985, cited in Bobaljik 2007: Appendix I). These 38 languages use standard markers along the lines of English *than* or Hindi-Urdu *-se*, morphemes lacking clear semantic content. Out of the languages that do not have degree morphology, many utilize standard markers with locative or directional meaning (Stassen 1985). For instance, Japanese uses the preposition *yor* ‘from’ as a standard marker (Stassen 1985, cited in Kennedy, in press).

- (9) *Tokyo-wa Sapporo-yori atatakai*
Tokyo-TOP Sapporo-from warm
‘It is warmer in Tokyo than in Sapporo.’ (adapt. Sawada, to appear: ex.1)

For Japanese (and languages like Japanese), two options exist. First, we can posit a full set of null degree morphemes corresponding to *more/er*, *as*, and *less*, leaving the standard marker vacuous: this approach would be in closest keeping with the relational analysis. This option is discussed by Beck, Oda, & Sugisaki (2004) and Kennedy (in press). Second, we could propose that there is no degree morphology at all in Japanese and that the standard marker is solely responsible for introduction of the ordering relation.

This second option is taken up by Sawada (to appear). Sawada posits a semantic interpretation for Japanese gradable predicates identical to the one proposed for gradable predicates under the relational analysis, in which they are of type $\langle d, et \rangle$ and take two arguments, an individual z and a degree d . Sawada assigns *yor* the same interpretation as posited in relational analysis accounts of English *more/er*, such that *yor* introduces a partial ordering relationship between degrees and semantically restricts the value of the degree argument d associated with the topic of comparison x by requiring that it exceed the d associated with the standard of comparison y .

- (10) a. $\|atatakai_{\langle d, et \rangle}(x, d)\| = \lambda d_{\langle d, et \rangle} \lambda z. \text{warm}(z) \geq d$
 b. $\|yori_{\text{STANDARD}}\| = \lambda y \lambda g \lambda x. \text{max}(g)(x) > \text{max}(g)(y)$

(adapt. from Sawada, to appear)

Once parts of the relational analysis have been adjusted (i.e., crediting the standard marker rather than degree morphology with introduction of the ordering relation), the core assumption of the relational analysis still stands: gradable predicates are of type $\langle d, et \rangle$. Thus, data from Japanese do not pose a serious challenge to the relational analysis.

However, there are two further – at this point, purely hypothetical – challenges to the relational analysis. First, we have not yet established whether the languages exemplified in (2) represent all typological possibilities. So far, the relational analysis has proved capable of handling an *either/or* situation: either the degree morphology introduces the ordering relation (English, Hindi-Urdu), or the standard marker does (Japanese, Latvian, Maasai). If some language X were found to possess both degree morphology and standard markers with locative or directional meaning, it is not clear how, under the relational analysis, we would be able to avoid making either the degree morphology or the standard marker semantically vacuous. Second, if gradable predicates in some language X were found to be of some type other than $\langle d, et \rangle$, the core tenet of the relational analysis would be called into question. These two points will be the pivot on which the remainder of this thesis will turn.

1.5: Looking ahead

In Section 2, I present my analysis of Navajo gradable predicates and degree constructions. I demonstrate that only a subset of gradable predicates (those marked with derivational prefixes (*'á-ní-²*) exhibit behavior associated with type $\langle d, et \rangle$ expressions. The vast majority of Navajo gradable predicates (marked with derivational prefix *ni-⁶*) act like expressions of type $\langle et \rangle$, the semantic type of positive-marked predicates under the relational analysis. I

argue that these derivational prefixes are degree morphemes in a sense distinct from English degree morphology: standard markers with directional and locative meaning introduce the ordering relation, while degree morphology determines the semantic type of the gradable predicate. Thus, Navajo fits into the typological gap bounded by the two points discussed at the end of §1.4, posing a significant challenge to the relational analysis.

2. Gradable predicates and degree constructions in Navajo

2.1: Introduction

In Section 2, I introduce the facts of Navajo gradable predicates and degree constructions. In §2.2, I show that Navajo exhibits the cross-linguistically common pattern of encoding ordering relations with standard markers. In §2.3, I demonstrate that certain Navajo gradable predicates exhibit alternation of two sets of derivational prefixes, ni^{-6} and $(\acute{a})-ni^{-2}$. All gradable predicates under discussion can be marked with ni^{-6} while only a small subset of predicates (largely with a dimensional meaning) can be marked with $(\acute{a})-ni^{-2}$. In §2.4-2.7, I show that the alternation between ni^{-6} and $(\acute{a})-ni^{-2}$ determines the type of the gradable predicate: predicates marked with ni^{-6} are expressions of type $\langle et \rangle$ while predicates marked with $(\acute{a})-ni^{-2}$ are expressions of type $\langle d, et \rangle$. These findings pose a challenge to the relational analysis, under which all gradable predicates are fundamentally of type $\langle d, et \rangle$, where type $\langle et \rangle$ expressions are derived through composition of the predicate with the null *pos* morpheme. Given the relative distribution and morphological markedness of type $\langle d, et \rangle$ and $\langle et \rangle$ expressions in Navajo, I conclude that it is untenable to propose that all predicates are of type $\langle d, et \rangle$ as held by the relational analysis. I instead argue that Navajo gradable predicate stems are measure functions (type $\langle ed \rangle$ expressions) that are converted into type $\langle et \rangle$ and $\langle d, et \rangle$ expressions through composition with ni^{-6} and $(\acute{a})-ni^{-2}$, which I identify as degree morphemes.

2.2: Outline of relevant Navajo morphology and syntax

Navajo is a polysynthetic language belonging to the Athabaskan family. The verb is marked extensively with both inflectional and derivational morphology such that a single inflected verb can convey the information conveyed in a full English sentence. The verb can be described through means of the simplified template adapted from Young and Morgan (1987), henceforth referred to as YM (1987). In the original template proposed by YM, many of the columns in (11) are further divided. For instance, position VI is divided into VIa-c.

(11) 0	I	II	III	IV	V	VI	VII	VIII	IX	X
PP	'á-				object	<i>ni</i> ⁻⁶ <i>ni</i> ⁻²		subject	classifier	stem

Subject: *sh* – I; *ni* – you; \emptyset – s/he, it; *ii(d)* – we (dual); 'a – unspecified person

Object: *sh* – me; *ni* – you; *bi* – him, her it; *yi* – him, her, it; *ah* – reciprocal; 'a – unspecified person, hw - areal

The verb stem – which contains the basic meaning of the verb – occurs to the far right of the verb word. The verb stem cannot occur in isolation: it is inflected according to mode (imperfective, perfective, iterative, optative, and future), where mode and aspect are primarily marked in VII and VI. The position closest to the verb stem (XI) is filled by the classifier, a single morpheme (from the set $\{\emptyset, t, l, d\}$) that may change to reflect an increase or decrease in the verb's valency (Hale 2000). Subject and object inflectional morphology is found in VIII and V, respectively. Two forms of third person object inflection (*yi* vs. *bi*) are given in (11): *yi* is only used if both subject and object are third person (glossed as 3'S and 3'O) and indicates disjoint reference (Willie 2000). Other positions in the template are occupied by derivational morphology, including VII and VI, where mode/aspect is typically marked. The template in (11) shows that *ni*⁻⁶ and *ni*⁻², two derivational morphemes that will be of importance in later discussion, are found in position VI, a position associated with mode/aspect marking.

The vast majority of inflected Navajo verbs can occur on their own without external DPs or additional material. This has been taken as evidence that all argument positions are saturated verb-word internally (Willie & Jelinek 2000, Faltz 2000).⁴ The (*'á*)-*ni*-²-marked gradable predicates under discussion in this thesis are an exception to this generalization.

- (12) a. *yiyiitśá*
 3O-3S-see-P
 ‘S/he saw him/her.’
- b. *At'ééd ashkii yiyiitśá'*
 girl boy 3sgO-3sgS-see-P
 ‘The girl saw the boy.’ (Speas 1990: 203)

As shown in (12b), when verb-external DPs are present, word order is typically SOV, but OSV word order can be derived through topicalization. Oblique arguments of the verb (e.g., indirect objects) are registered as object inflection on postpositions that may either be separate from the verb word or incorporated as a prefix, shown as ‘PP’ in position 0 of the above template.

Multiple unique morphemes of the same shape may occur (one at a time) in the same position in the template. When differentiation between them is relevant for our purposes, I will distinguish between morphemes using the same superscript Arabic numerals employed by YM (1987) in their sketch of Navajo grammar. For instance, *ni*-⁶ is the sixth unique prefix of the shape *ni*- in column VIb.

Two types of complementizers (*-i/-ígíí* and *-go*) will be relevant in later discussion and warrant brief mention. The complementizers *-í* and *-ígíí* are usually considered to be nominalizers but may be used more generally to subordinate CPs that are taken as arguments by

⁴ Subject and object inflection may be regarded either as the actual arguments of the verb such that external DPs are in adjunct position (as under the Pronominal Argument Hypothesis, c.f. Willie & Jelinek 2000), as agreement morphology (Hale 2000), or as enclitics added at a late stage in the syntactic derivation (Speas 1990). On these two latter views, verb-external DPs are syntactic arguments of the verb.

the matrix verb (Schauber 1979: 18). Both are glossed as COMP since the differences between the two are orthogonal to this study.

- (13) *Bił Jáan Mary yiyiitsánígíí bi'diit'á*
 Bill John Mary 3sg'O-3sgS-see-P-COMP 3sgS-bother
 'It bothers Bill that John saw Mary.'
 (Schauber 1979: 241)

According to Schauber, *-go* "is a subordinator for adverbial clauses" (1979: 31) and can be variously rendered in English as 'if', 'when', 'in case that', and 'because', leading Schauber to conclude that *-go* serves a primarily syntactic, rather than semantic, function. As shown in (14), clauses subordinated by *-go* (glossed as SUB) can be deleted felicitously, which is expected given the view that Navajo verbs saturate all argument positions verb-internally.

- (14) a. *Shizhé'é níyáago da'diidíł*
 1sg-father 3sgS-come-P-SUB 1plS-eat-F
 'When my father comes, we'll eat.'
 (Schauber 1979: 32)

- a.' *Da'diidíł*
 1plS-eat-F
 'We will eat.'
 (Schauber 1979: 228)

- b. *Mary shaaníyáago Jáan bił hózhó*
 Mary 1sgO-3sgS-come-P-SUB John 3sgO-WITH 3sgS-happy
 'Because Mary came to see me, John is happy.'
 (Schauber 1979: 32)

- b.' *Jáan bił hózhó*
 John 3sgO-WITH 3sgS-happy
 'John is happy.'
 (Schauber 1979: 228)

2.3: Standard markers and the (basic) syntax of Navajo degree constructions

In §1.4, the observation was made that a large percentage of languages lack degree morphology and introduce ordering relations {>, <, =} solely through standard markers (Bobaljik 2007: Appendix 1; Stassen 1985). In such languages, a common type of standard marker is an adposition typically used in locative or directional constructions. As will be illustrated in this section, Navajo standard markers are of this variety although later discussion will challenge the

view that Navajo lacks degree morphology entirely. Examples (15)-(18) exemplify the four standard markers: (i) directional postposition *P-lááh* ‘beyond P; (ii) directional postposition *P-oh* ‘short of P’; (iii) locative enclitic *DP-gi* ‘at DP’; and postposition (iv) *P-ee* ‘with P’. The third line of the gloss of each (a) sentence identifies the constituents of the comparative construction, following the same conventions as in §1.2. In the (a) and (b) sentences of each set, the reader is asked to note the alternation between derivational prefixes (*’á*)-*ni*⁻² and *ni*⁻⁶.

Examples (15a,b) show the use of the Navajo comparative postposition *P-lááh* ‘beyond P’ in comparative constructions: *-lááh* is interpreted as [$>$] in degree constructions and *P-* is pronominal marking corresponding to the person and number of the standard of comparison. When the predicate is marked with *ni*⁻⁶ as in (15b), the degree expression must be subordinated by *’át’éego*, a subordinated copula. More will be said of *’át’éego* throughout Section 2 and a formal analysis will be proposed in Section 4. Example (15c) shows *P-lááh* used in a locative construction. In all examples, relevant morphemes have been separated in the Navajo to match the interlinear gloss.

- (15) a. (*Shí*)⁵ *shínaaí* *bi-lááh* *’áníshdííł*
 1sg. 1sg-older.brother 3sgO-BEYOND *’á-ní*⁻²-1sgS-big
 TOPIC OF STANDARD OF STANDARD ??? - GRADABLE
 COMPARISON COMPARISON MARKER PREDICATE
 ‘I’m larger than my older brother.’ (Young & Morgan 1987: d85)
- b. *Díí bilasáana* *’eii bilasáana* *bi-lááh* *’át’éego* *nitł’iz*
 DET apple DET apple 3sgO-BEYOND 3sgS-be-SUB *ni*⁻⁶-3sgS-hard
 ‘This apple is harder than that apple.’ (Irene Silentman, p.c.)
- c. *’Adáádáá’ Tóta’* *bi-lááh-góó* *niséyá*
 yesterday Farmington 3sgO-BEYOND-TO 1sgS-go-P
 ‘I went beyond Farmington yesterday.’ (YM 1987: d85)

⁵ Independent pronouns as the topics of comparison are only given for expository purposes and their optional nature is indicated with parentheses. The presence of an independent pronoun is unnecessary here since the topic of comparison is also marked as subject inflection on the gradable predicate. Independent pronouns are only used in emphatic constructions (e.g., *He* threw the ball.’). See Willie & Jelinek (2000) for discussion.

Examples (16a,b) show the use of Navajo comparative postposition *P-'oh* 'short of P'. The postposition *-'oh* receives the interpretation [$<$] in degree constructions. Once again, when the predicate is marked with *ni⁻⁶*, *'át'éego* must subordinate the degree expression. Example (16c) shows *P-'oh* used outside of the comparative construction.

- (16) a. (*Shí*) *shizhé'é* *bi-'oh* *'ánístso*
 1sg. 1sg-father 3sgO-SHORT.OF *'á-ní⁻²*-1sgS-tall
 TOPIC OF STANDARD OF STANDARD ??? - GRADABLE
 COMPARISON COMPARISON MARKER PREDICATE
 'I'm shorter than my father' (YM 1987: d222)
- b. *Shí shichidí nihígíí bi-'oh 'át'éego dilwo'*
 1sg. 1sg-car 2sg-COMP 3sgO-SHORT.OF 3sgS-be-SUB *ni⁻⁶*-3sgS-fast
 'Your car is not as fast as mine.' (YM 1987: g193)
- c. *Diné t'oh bitaa'niihgo 'atah shi-'oh*
 people hay 3sgO.distribute-SUB unspecO-among 1sgO-SHORT.OF
'anéétna'
 unspecS-last
 'When hay was distributed among the people, I was among those that it
 lasted short of.' (YM 1987: d221)

Examples (17a,b) show the use of Navajo locative enclitic *-gi* 'at' to mark the standard of comparison in equative constructions: *-gi* is interpreted as [=] in degree constructions. Again, when the predicate is marked with *ni⁻⁶* as in (17b), *'át'éego* must subordinate the degree expression. Example (17c) shows *-gi* used in a locative construction.

- (17) a. *Shiléechaq'í béégashii yáazh-gi 'ánístso*
 1sg-dog calf-AT *'á-ní⁻²*-3sgS-large
 TOPIC OF STANDARD OF - STANDARD ??? - GRADABLE
 COMPARISON COMPARISON MARKER PREDICATE
 'My dog is as big as a calf.'
- b. *Shideezhí bimá-gi 'át'éego nizhóní*
 1sg-little.sister 3sg-mother-AT 3sgS-be-SUB *ni⁻⁶*-3sgS-pretty
 'My little sister is as pretty as her mother' (YM 1987: g193)

c. *Látsíní 'ádeilne'go* *Kinłání-gi nihaa ninádahanih*
bracelet 3plO-1dplS-make-I-SUB Flagstaff-AT 2sgO-to 3plO-1dplS-sell
‘When we make bracelets, we sell them in Flagstaff.’ (YM 1987: d12)

The examples in (18) demonstrate a second method of expressing equative meaning, in complementary distribution with the first. In this construction, an incorporated postposition *P-ee* ‘with P’ serves as the standard marker: *-ee* is interpreted as [=] in degree constructions. The *P-ee* equative construction is notable for being the only construction seen thus far in which *ni⁻²*, rather than ‘*á-ni⁻²*’, marks the predicate in the (a) sentence. Furthermore, as demonstrated by the ungrammaticality of (18b,c) predicates involved in this equative construction cannot be marked by *ni⁻⁶*. Example (18d) shows the *P-ee* postposition used outside of the equative construction.

- (18) a. *Shideezhí bimá y-ee-nítnééz*
1sg-little.sister 3sg-mother 3sg’O-WITH-*ni⁻²*-3sgS-tall
TOPIC OF STANDARD OF STANDARD - ??? - GRADABLE
COMPARISON COMPARISON MARKER PREDICATE
‘My little sister is as tall as her mother.’
- b. **Shideezhí bimá y-ee-nineeéz*
1sg-little.sister 3sg-mother 3sg’O-WITH-*ni⁻⁶*-3sgS-tall
(‘My little sister is as tall as her mother.’)
- c. **Díí bilasáana ‘eii bilasáana y-ee-nít’iz*
DET apple DET apple 3sg’O-WITH-*ni⁻⁶*-3sgS-hard
(‘This apple is as hard as that apple.’)
- d. *Bii’adéest’íí b-ee binák’eejí’ adíníshdín*
mirror 3sgO-WITH 3sg-eyes-LOC 1sgS-shine.light
‘I’m reflecting light into his eyes with a mirror.’ (YM 1987: d29)

Having addressed the degree constructions in Navajo that utilize postpositions or enclitics with locative or directional meaning to introduce ordering relations {>, <, =}, we can now survey the remaining Navajo degree constructions that do not use standard markers. Once again, the reader is asked to note the alternation between derivational prefixes (‘*á*’)-*ni⁻²* and *ni⁻⁶*.

The sentences in (19) exemplify the measure phrase construction. For some speakers, it is preferable to mark the measure phrase with locative enclitic *-gi* ‘at’, but this is not obligatory.

Measure phrase constructions are only grammatical if the predicate is marked with (*’á*)-*ní*⁻².

- (19) a. *Bikáá’adání neeznáá ’adées’eez ’ání-Itéél / *niteel*
 table ten feet *’á-ní*⁻²-3sgS-wide *ní*⁻⁶-3sgS-wide
 TOPIC OF MEASURE ??? - GRADABLE
 COMPARISON PHRASE PREDICATE
 ‘The table is ten feet wide.’ (Irene Silentman, p.c.)
- b. *Dízdíin dah alzhin-gi ’ání-sh-máál / *nismaal*
 four inch-AT *’á-ní*⁻²-1sgS-big.around *ní*⁻⁶-1sgS-big.around
 ‘I am forty inches around.’ (Ellavina Perkins, p.c.)

The sentences in (20) show the *wh*-construction, which I consider to be a degree construction on par with those described above (c.f. Klein 1980, Corver 1997, Rullmann 1995). As with the *P-ee* equative construction, only the *ní*⁻² morpheme (rather than *’á*)-*ní*⁻² marks the predicate in (20a). In (20b), the subordinated copula once again appears between the gradable predicate and the *wh*-word.⁶ Sentence (20b) is ambiguous between the two readings indicated. A possible explanation for this ambiguity is posited in §2.7.3.2. The verb in (20c) uses the same stem as in (20b) (*-ts’óóz(i)*), but this time it is marked with *ní*⁻² and unambiguously receives a ‘How X is A?’ reading.

- (20) a. *Haa nítso?*
 wh *ní*⁻²-3sgS-large
 WH- ??? - GRADABLE
 WORD PREDICATE
 ‘How large is it?’ or ‘What size is s/he?’
- b. *Haash yit’éego ’áts’óózí*
 wh 3S-be-SUB *ní*⁻⁶-3sgS-thin
 ‘How/why is he/she skinny?’ (possibly: ‘How skinny is s/he?’)

⁶ The reader will note that the subordinated copula in (20b) is *yit’éego*, not *’át’éego*. The distinction between the two forms is unclear to me, but I note that *yit’éego* (rather than *’át’éego*) is the form of the copula that occurs in *wh*-constructions: a search of such constructions in YM (1987) yields no exceptions to this generalization. The difference between *’át’éego* and *yit’éego* (if any) is left for future research.

- c. *Haanítts'óóz*
 wh-*ní*⁻²-3sgS-thin
 'How skinny is s/he?'

(Irene Silentman, p.c.)

The final degree construction in Navajo features the intensifier 'ayóo 'very'. As shown in (21), this is the only degree construction in which the subordinated copula 'át'éego does not obligatorily subordinate the degree expression.

- (21) a. *Ayóo 'ánítdáás*
 very 'á-*ní*⁻²-3sgS-heavy
 'S/he is very heavy.'
- b. *Ayóo nineez*
 very *ni*⁻⁶-3sgS-tall
 'S/he/it is very tall, long'

To summarize the above findings, TABLE A gives all items that may appear in a degree construction. I will collectively refer to these items as DEGREE EXPRESSIONS, following Neeleman, van de Koot, & Doetjes (2004) and Doetjes (2008). I refer these items as degree expressions to keep them clearly differentiated from degree morphology.

Table A: Navajo degree expressions

Expression	translation	semantic function or interpretation
a. <i>P-lááh</i>	'beyond P'	more than
b. <i>P-'oh</i>	'short of P'	less than
c. DP+ <i>gi</i>	'at DP'	equal to
d. <i>P-ee</i>	'with P'	equal to
e. Measure phrase	---	---
f. <i>haa</i>	'how, what'	<i>wh</i> -word
g. 'ayóo	'very'	intensifier

This section outlined the basic syntax of Navajo degree constructions, noting (i) the use of postpositions and enclitics with locative or directional meaning to introduce ordering relations in all degree constructions except the measure phrase construction, and (ii) the alternation of ('á)-*ní*⁻² and *ni*⁻⁶. If not for the alternation between ('á)-*ní*⁻² and *ni*⁻⁶, the Navajo data would look very similar to the Japanese data cited in Section 1, where degree morphology (or, any overt

morphological marking on the predicate) was entirely absent and ordering relations were introduced with locative or directional postpositions.

What do we make of (*á*)-*ní*⁻² and *ni*⁻⁶? In the remainder of Section 2, I will propose and defend semantic interpretations of (*á*)-*ní*⁻² and *ni*⁻⁶. To preview the conclusion, I propose that these prefixes are degree morphemes. Unlike English *more/er*, *less*, and *as*, *ni*⁻⁶ and (*á*)-*ní*⁻² do not introduce ordering relations. Rather, they determine the semantic type of the gradable predicate: composition with (*á*)-*ní*⁻² results in a predicate of type <d,et> while composition with *ni*⁻⁶ results in a predicate of type <et>.

2.4: Gradable predicates in Navajo & the distribution of (*á*)-*ní*⁻² and *ni*⁻⁶

Navajo has no dedicated lexical class corresponding to English adjectives. Rather, neuter predicates denote gradable properties, qualities, and states.⁷ I focus on the class of NEUTER IMPERFECTIVE ADJECTIVALS, predicates with gradable meaning that describe the subject in terms of:

...attributes, activity, status, or other features...including dimension (size, shape, weight), texture (smooth, rough), appearance (pretty, ugly), quantity (much, many), color (red, white, reddish, whitish), quality (good, sweet, selfish, stinking), and distance (far).
(YM 1987: g189).⁸

⁷ Neuter predicates are so-called because they are only conjugated in a single mode – here, imperfective – rather than the full range of modes available (imperfective, perfective, future, optative, and iterative).

⁸ In addition to predicates conjugated only in the imperfective aspect, adjectival meaning is also conveyed by neuter perfective verbs. Neuter perfective verbs typically describe the subject or object in either “an enduring state of rest...or an enduring state of being” (YM 1987: g194, g196). For instance, *sití* ‘he/it (animate) is lying’, *sigan* ‘it is dried, withered,’ *shibécézh* ‘it is boiled,’ and *sido* ‘it is hot, heated’ all are neuter perfective verbs denoting qualities similar to those denoted by English adjectives. Neuter perfective verbs not only do not exhibit the alternation between *ni*⁻⁶VI and *ní*⁻²VI, but neuter perfective verbs are never marked with *ni*⁻⁶VI. Given that the focus of this thesis is the alternation between these two prefixes - and the subsequent alternation in semantic and syntactic behavior - I note the existence of neuter perfective verbs but recognize that a full treatment of this category is beyond the scope of the thesis.

YM (1987) further divide the set of neuter imperfective adjectivals into two categories – dimensional and descriptive – echoing a distinction made across the Athabaskan language family. In Athabaskan languages, dimensional and descriptive predicates are distinguished based on their ability to take particular derivational morphology that marks COMPARATIVE and ABSOLUTE aspect (YM 1987: g192). Dimensional predicates can be marked for both comparative and absolute aspect, while descriptive predicates can only be marked for the absolute aspect.⁹

The comparative aspect is marked by prefixes ‘ \acute{a} -¹I and ni -²VI. Absolute aspect is marked by ni -⁶VI. For each prefix, the Roman numeral corresponds to one of the positions in the verb template in (11). The superscript Arabic numeral distinguishes the prefix from others with the same shape occupying the same template position: for instance, ni -⁶VI is the sixth unique prefix of the shape ni - that can occur in position VI of the template.¹⁰ From this point on, Roman numerals will be omitted when referring to these prefixes, although I will retain the Arabic numerals when referring to ni -⁶ and ni -² for perspicacity.¹¹

2.4.1: Absolute Aspect: ni -⁶

A non-exhaustive list of absolute-marked dimensional and descriptive predicates is given in TABLE B. As evidenced by the inclusion of *nizhóni* ‘It is pretty’ in the dimensional category, classification as a ‘dimensional’ predicate does not necessary entail that the predicate denotes

⁹ For discussion of absolute and comparative aspect in northern Athabaskan languages, please refer to Kari 1979, 1990 (for Ahtna), Rice 1989 (for Slave), Axelrod 1993 (for Koyukon), and Hargus 2007 (for Witsuwit’en).

¹⁰ For reference, these prefixes are actually listed as ‘ \acute{a} -¹Ib, ni -²VIb, and ni -⁶VIb in the grammar portion of YM 1987. For perspicuity, I have omitted the letters, which indicate subdivisions within positions in the template (e.g., position VIb is distinct from positions VIa and VIc).

¹¹ In YM (1987), the absolute aspect-marking prefix ni - is identified as ni -⁶ in the grammar section and as ni -⁴ in the dictionary section. The comparative aspect-marking ni - is identified as ni -² in the grammar and ni -¹ in the dictionary. The prefix ‘ \acute{a} - is given as ‘ \acute{a} -¹ in the grammar and ‘ \acute{a} -³ in the dictionary. I will refer to these by the numbers used in the grammar. The reader may assume that any other Arabic numerals used to distinguish between prefixes of the same shape use the numbering convention found in the grammar, not the dictionary.

dimension in a strict sense. Rather, as noted above, membership in the dimensional category means only that a given predicate can be marked for both comparative and absolute aspect, which *nizhóní* can, c.f. TABLE D.

Table B: *Ni*⁻⁶-marked dimensional and descriptive predicates

Dimensional Predicates		Descriptive Predicates	
<i>nisneez</i>	‘I am tall’	<i>nishchxon</i>	‘I stink’
<i>níneez</i> ¹²	‘You’re tall’	<i>níchxon</i>	‘You stink’
<i>nineez</i>	‘He is tall/it is long’	<i>niłchxon</i>	‘It/he stinks’
<i>nidaaz</i>	‘He is heavy’	<i>niłhin</i>	‘It is greasy’
<i>nitsaaz</i>	‘It is big’	<i>niłtólí</i>	‘It is clear’
<i>niteel</i>	‘It is wide, broad’	<i>‘aa nishchí</i>	‘I am stingy’
<i>nizhóní</i>	‘It is pretty’	<i>nił’iz</i>	‘It is hard’

While a limited number of predicates denoting qualities such as ‘pretty’ are classified as dimensional predicates, all predicates that denote dimensions in a strict sense (‘tall’, ‘big’, ‘heavy’, etc.) are obligatorily members of the dimensional category. There is one major exception to this generalization: for the most part, predicates with diminutive dimensional meanings (‘small’, ‘lightweight’, ‘thin’) fall into the descriptive category, taking only absolute aspect marking (see exceptions to this generalization in TABLE D).

Whereas dimensional predicates are only marked with *ni*⁻⁶ in the absolute aspect, descriptive predicates may be marked with another derivational prefix in addition to *ni*⁻⁶. As shown in TABLE C, ‘á- marks diminutive predicates,¹³ *di*⁻¹⁰ marks predicates denoting shade of a

¹² As can be seen from *nineez* and *níchxon*, *ni*⁻⁶ surfaces with high tone due to interaction with the second person prefix *ni*.

¹³ According to YM (1987), this is the same ‘á- that appears in the comparative aspect. This, coupled with the fact that there is high tone on the *ni*- prefix (c.f. (6g,h) above), makes these predicates appear suspiciously similar to predicates marked for the comparative aspect. In fact, Rice writes that “in the Slavey dialect of [Slave Athabaskan], many dimensional verb themes occur only in the comparative aspect form; the neuter [‘absolute’ - EBA] form is not used. It is replaced by the comparative aspect form with the prefix ‘a- ‘so’” (1989: 1094). The Slave prefix ‘a- is used in comparative constructions involving dimensional verbs. The Slave ‘a- is cognate to the Navajo ‘á-, although it is not clear which ‘á-, if such a distinction can be readily made. I have added the Navajo forms of the same verbs given by Rice to the chart below. The Bearlake dialect retains the *ne*- thematic prefix.

particular color, *fi-* marks predicates denoting pure colors, and *di*⁻⁷ has a wide distribution that cannot be reduced to a single meaning. The examples in TABLE D also show that in the presence of certain of these derivational prefixes, *ni*⁻⁶ may not appear on the surface: *ni*⁻⁶ deletes in third person forms after *di*⁻¹⁰, *fi-*, and ‘*á-*’, but not after *di*⁻⁷ (YM 1987: g189). First person forms are given in TABLE C to show that *ni*⁻⁶ is present underlyingly.¹⁴

Table C: *Ni*⁻⁶-marked predicates with additional derivational prefixes

Prefix	First person	Third person	Stem	Translation
a. ‘ <i>á-</i> ’	‘ <i>ánísts’óózí</i> ’	‘ <i>áts’óózí</i> ’	- <i>ts’óózí</i> ‘lightweight’	‘lightweight’
b. ‘ <i>á-</i> ’	‘ <i>áníst’ísí</i> ’	‘ <i>áts’ísí</i> ’	- <i>ts’ísí</i> ‘small’	‘small’
c. <i>di</i> ⁻⁷	<i>dinishgai</i>	<i>dinilgai</i>	- <i>gai</i> ‘white’	‘whitish’
d. <i>di</i> ⁻⁷	<i>dinishzhin</i>	<i>dinilzhin</i>	- <i>zhin</i> ‘black’	‘dark brown’
e. <i>fi-</i>	<i>finishgai</i>	<i>figai</i>	- <i>gai</i> ‘white’	‘white’
f. <i>fi-</i>	<i>finishchíf’</i>	<i>fighíf’</i>	- <i>chíf’</i> ‘red’	‘red’
g. <i>di</i> ⁻¹⁹	<i>dinishjool</i>	<i>dijool</i>	- <i>jool</i> ‘round’	‘round, plump’
h. <i>di</i> ⁻¹⁰	<i>dinish’il</i>	<i>di’il</i>	- <i>il</i> ‘hairy’	‘hairy’
i. <i>di</i> ⁻¹⁰	<i>dinishwo’</i>	<i>dilwo’</i>	- <i>wo’</i> ‘fast (runner)’	‘fast, fleet’

2.4.2: Comparative Aspect: ‘*á-ni*⁻²’

A search of all entries in YM (1987) and discussion with speakers reveals the forms in TABLE D to be an exhaustive list of predicates that can be marked for the comparative aspect. The comparative aspect entries in TABLE D are divided into two categories, the ‘simple’ comparative and the ‘derived’ comparative. The names for these categories are immaterial to the present discussion and will not be used after this section, but briefly: ‘simple’ comparative-aspect predicates are only marked with *ni*⁻², while ‘derived’ comparative-aspect predicates are marked with ‘*á-ni*⁻²’. ‘Simple’ comparative-aspect predicates are used in *wh*-constructions (e.g.,

Slavey	Bearlake	Navajo	Translation
‘ <i>actsíle</i> ’	<i>netsíle</i>	‘ <i>áts’ísí</i> ’	‘It is small’
‘ <i>aeghale</i> ’	<i>neghale</i>	‘ <i>áts’óózí</i> ’	‘It is narrow’

(Adapted from Rice 1989: 1095)

However, Navajo predicates with a negative meaning are still *ni*⁻⁶-marked (c.f. YM 1987: g189). As will be seen in later discussion, negative gradable predicates pattern syntactically with the other descriptive (*ni*⁻⁶-marked) predicates.

¹⁴ Throughout the paper, interlinear glosses will indicate the presence of *ni*⁻⁶ and (‘*á*’)-*ni*⁻² even when they are not visible on the surface.

‘How A is X?’) and in one type of equative construction, c.f. (18) and (20). ‘Derived’ comparative-aspect predicates are obligatorily used in all other degree constructions, c.f. (15)-(17), (19), and (21). In later discussion, when referring inclusively to ‘simple’ and ‘derived’ comparative aspect-marked predicates, I will refer to the prefixation as (‘á)-ní⁻². I leave to future research the question of how ‘á- and ní⁻² are further decomposable in the morphosyntactic structure of a comparative-marked predicate.

Entries given as ‘—’ in TABLE D are unattested both in a search of YM (1987) and in discussion with speakers. The form ‘ádóolwo’ ‘fast’ is found in YM (1987: g192), but was not accepted by all speakers interviewed.

Table D: Distribution of ni⁻⁶ and (‘á)-ní⁻² prefixes on gradable predicates

	Translation	Absolute: ni ⁻⁶	Simple comparative: ní ⁻²	Derived comparative: ‘á-ní ⁻²
(A)1	large, big, tall	<i>nitsaa</i>	<i>níftso</i>	‘áníftso
2	wide, thick, slender	<i>nitsaaz</i>	<i>níftsaáz</i>	‘áníftsaáz
3	number	<i>nít’é</i>	<i>níilt’e’</i>	‘áníilt’e’
? 4	to extend, be in quantity	<i>neel’áá</i>	<i>nécláá’</i>	‘ánécláá’
? 5	distant, far	<i>nízaad</i>	<i>nízah</i>	‘ánízáád
6	tall	<i>nineez</i>	<i>níftnééz</i>	‘áníftnééz
7	wide	<i>niteel</i>	<i>níftéél</i>	‘áníftéél
8	heavy	<i>nidaaz</i>	<i>níftdáás</i>	‘áníftdáás
9	big	—	<i>níldííl</i>	‘áníldííl
10	big around	<i>nimaal</i>	<i>nílmáál</i>	‘ánílmáál
11	pretty	<i>nizhóni</i>	<i>néeshóní</i>	‘ánóoshóní
12	strong	<i>bidziil</i>	<i>bóodziil</i>	‘ábóodziil
13	fast	<i>dilwo’</i>	<i>dóolwo’</i>	?? ‘ádóolwo’
14	wet	<i>ditléé’</i>	<i>dóotléé’</i>	—
15	stinky	<i>nichxon</i>	<i>níchxon</i>	—
(B) 1	narrow, skinny	‘áftsáží	<i>níftsaží</i>	—
2	slender	‘áfts’óózí	<i>nífts’óózí</i>	—
3	small	<i>yázhí</i>	<i>nítyázhí</i>	—
4	mean, nasty	—	<i>níftch’íídií</i>	—
5	ugly, evil, mean	—	<i>níftch’ó’í</i>	—

The entries in TABLE D reiterate the observation that the Athabaskan ‘dimensional’ category is not solely comprised of predicates with strictly dimensional meanings: while the majority of the predicates in Set A are strictly dimensional in meaning, ‘ánóoshóní ‘pretty’,

‘*ábóodziil* ‘strong’ and, potentially, ‘*ádóolwo* ‘fast’ are not. Interestingly, with the exception of ‘*ánécláá*’ ‘to extend, be in quantity’, these three predicates are the only predicates in which *ni*⁻² is not visible on the surface, nor do they show the raising of stem vowels seen with all other predicates. I remain agnostic whether these irregularities of form are related to the predicates’ non-dimensional denotations.

Predicates in Set B can only occur with *ni*⁻² such that these predicates are only found in *wh*-constructions and *P-ee* equatives. Perhaps notably, these stems differ from the stems in Set A in two ways. The first two forms in Set B – *nífts’óózí* ‘comparatively narrow, skinny’ and *níftsází* ‘comparatively slender’ – are both diminutive. Like other predicates with diminutive meaning, they are marked with ‘*á-ni*⁻⁶ in the absolute aspect (c.f. TABLE C). In addition, the last three forms – *nítyázhí* ‘small’, *níłch’íłdii* ‘mean, nasty’, and *níłchxó’í* ‘ugly’ – are interesting because they all use nominal elements as their stem, e.g., *yázhí* ‘young (animal or human)’, *ch’íłdii* ‘evil spirit’, *chxó’í* ‘the smelly one’.¹⁵ Hale notes that many Navajo stems are most likely nominal in origin (2000: 88). By contrast, none of the predicates in Set A are diminutive in meaning and the stems are verbal. It is unclear whether the differences in stem meaning is significant to the division between Set A and Set B, but these observations will be incorporated into the discussion of the type of the verb stem in §2.5.2.

2.5: The semantics of the ‘absolute’ and ‘comparative’ aspects

Having outlined the distribution of YM’s absolute and comparative aspect, we may now consider the differences in semantics between the two aspects. The informal distinction drawn by YM between the comparative and absolute aspect is indicated in (22) below, where *nisneez* and ‘*ánísnééz* are both derived from the verb stem *-neez* ‘tall.’

¹⁵ In fact, if we take the complementizer *-i* to always function as a nominalizer (c.f. §2.2), then all of the stems in Set B are nominal Faltz (2000: 47).

- (22) a. absolute $ni^{-6}+1sgS+neez$ *nisneez* ‘I am long or tall in an absolute sense’
- b. comparative $‘á-ni^{-2}+1sgS+neez$ *‘ánisnééz* ‘I am long or tall (in a relative or comparative sense)’
(adapt. YM 1987: g117)

To ‘be tall in an absolute sense’ recalls the positive construction. Recall from Section 1 that according to the relational analysis, the null positive degree morpheme *pos* introduces a contextual standard of comparison and imposes a semantic restriction on the predicate’s degree argument *d* such that *d* exceeds the contextual standard. Following the intuitive connection between YM’s absolute aspect and the positive construction, I propose that ni^{-6} has the interpretation in (23a). In all interpretations, *x* is an individual $\langle e \rangle$, *d* is a degree $\langle d \rangle$, and *s* is a verb stem of thus-far indeterminate type. According to the derivation below, the output of composition of the stem with ni^{-6} is an expression of type $\langle et \rangle$.

- (23) a. $\|ni^{-6}\| = \lambda s \lambda x. s(x) > STND(s)$
- b. Composition of ni^{-6} with gradable predicate stem *neez* ‘tall’:
 $[\lambda s \lambda x. g(x) > STND(s)](neez) \rightarrow [\lambda x. tall(x) > STND(tall)]$
 Where $[[ni_neez]]$ is of type $\langle e, t \rangle$.
 Composition of ni_neez with an individual ‘I’ type $\langle e \rangle$:
 $[\lambda x. tall(x) > STND(tall)](1sgS) \rightarrow tall(‘I’) > STND(tall)$
 Where $[[nisneez]]$ is of type $\langle t \rangle$.
 $\|nisneez\| = \text{Individual ‘I’ is tall beyond a contextually determined standard of comparison related to the predicate ‘tall.’}$

If YM’s absolute aspect corresponds to *pos*, where does the comparative aspect fit into previous theories of gradable predicates? In (22b), *‘ánisnééz* denotes ‘I am long or tall (in a relative or comparative sense)’, such that ‘I’ has height to a degree defined in relation to some other individual. Intuitively, the comparative aspect recalls the inherently comparative meaning of a type $\langle d, et \rangle$ gradable predicate under the relational analysis, wherein two degree arguments are related by the relation \geq . Following this intuitive correlation, I propose that $(‘á)-ni^{-2}$

introduces a degree argument d , converting the stem into an expression of type $\langle d, et \rangle$, the type of all gradable predicates under the relational analysis. Composition of $(\acute{a})-ni^{-2}$ with gradable predicate stem $-neez$ ‘tall’ is shown in (24). In (24b), σ is the standard of comparison that either directly saturates or imposes a restriction on the value of d . In the following derivation, the output of composition of the stem with $(\acute{a})-ni^{-2}$ is an expression of type $\langle d, et \rangle$.

(24) a. $\|(\acute{a})-ni^{-2}\| = \lambda s \lambda d \lambda x. s(x) \geq d$

b. Composition of $(\acute{a})-ni^{-2}$ with gradable predicate stem $neez$ ‘tall’:

$[\lambda s \lambda d \lambda x. g(x) \geq d](neez) \rightarrow [\lambda d \lambda x. tall(x) \geq d]$

Where $\acute{a}ni_nééz$ is of type $\langle d, et \rangle$.

Composition of $\acute{a}ni_nééz$ with degree-denoting argument σ .

$[\lambda d \lambda x. tall(x) \geq d](\sigma) \rightarrow [\lambda x. tall(x) \geq \sigma]$

Where $\acute{a}ni_nééz(\sigma)$ is of type $\langle e, t \rangle$.

Composition of $\acute{a}ni_nééz(\sigma)$ with an individual ‘I’ of type $\langle e \rangle$:

$[\lambda x. tall(x) \geq \sigma](1sgS) \rightarrow tall('I') \geq \sigma$

Where $\acute{a}nísnééz$ is of type $\langle t \rangle$.

$\|\acute{a}nísnééz\| = \text{Individual 'I' is tall at least to } \sigma$.

2.6: Implications of the proposed interpretations

Before considering the extensive empirical evidence in favor of these interpretations, we may briefly note the assumptions woven into the above interpretations. First, I am proposing that these derivational morphemes are in fact degree morphemes. Second, the most basic form of a gradable predicate – here, the stem – cannot be of type $\langle d, et \rangle$, as held by the relational analysis, or even of type $\langle et \rangle$ unless we propose that at least one of the degree morphemes is semantically vacuous. I will motivate each assumption here.

2.6.1: Ni^{-6} and $(\acute{a})-ni^{-2}$ are degree morphemes

A first piece of evidence in favor of treatment of ni^{-6} and $(\acute{a})-ni^{-2}$ as degree morphemes is their position in the Navajo verb template: ni^{-6} and ni^{-2} are found where aspect and mode

markers would typically be found, as shown in the template in (11).¹⁶ Grano (2008) discusses the relation between aspectual marking and degree morphology (i.e., *hen* ‘very’) in Mandarin. He demonstrates that whereas overt aspectual morphology must mark event-denoting predicates (following Klein, Li, & Hendriks 2000) gradable, stative predicates instead must co-occur with degree morphology. In other words, aspectual morphology and degree morphology perform the same syntactic function under Grano’s analysis, but for two different kinds of predicates (gradable vs. event-denoting). If *ni*-⁶ and (*’á*)-*ni*-² are degree morphemes, then they bolster (and are bolstered by) the cross-linguistically close relation between mode/aspect and degree morphology.

Second, a division between a *pos* morpheme and a generalized *deg* morpheme (i.e., (*’á*)-*ni*-²) would not be entirely unexpected. In our discussion of degree morphemes in Section 1, *pos* was seen to behave differently from all other degree morphemes in two ways. First, *pos* is the only morpheme that introduces its own standard of comparison. All other degree morphemes (*more/er*, *less*, *as*) only introduce an ordering relation and rely on the overt standard of comparison (introduced by the standard marker) to introduce the second degree. Thus, *pos* is semantically ‘autonomous’ while all other degree morphemes rely on a standard of comparison (either overt or reconstructed from context) for interpretability. Furthermore, *pos* is the only degree morpheme that is consistently unpronounced, with the exception of Mandarin *hen*. This characteristic is perhaps not significant on its own, but the division between the non-overt *pos* on one side and the other, consistently overt, degree morphemes (*more/er*, *less*, *as*) on the

¹⁶ The similarity between *ni*-⁶ and a different *ni*- morpheme – the one that marks a particular form of the Imperfective mode, known as the *ni*-Imperfective – is so notable that Faltz proposes that the neuter imperfective adjectivals are conjugated according to the *ni*-Imperfective mode (1998: 296-297), contra YM who propose that neuter imperfective adjectivals have null mode/aspect morphology (YM 1987: g192).

otherrecapitulates the division between *pos* vs. *deg* (or, ni^{-6} and $(\acute{a})-ni^{-2}$) that I propose for Navajo.¹⁷

2.6.2: The verb stem is a measure function

In the proposed interpretation of each degree morpheme, composition of the stem degree morphology produces predicates of type $\langle et \rangle$ and $\langle d,et \rangle$. Proposing that the verb stem – from which both $\langle et \rangle$ and $\langle d,et \rangle$ predicates are derived – is of either of these two types would make either ni^{-6} or $(\acute{a})-ni^{-2}$ semantically vacuous. It would seem uneconomical for the vacuous prefix to be obligatorily present. Thus, the Navajo data are in conflict with the relational analysis, in which all gradable predicates are *in their most basic form* of type $\langle d,et \rangle$. Furthermore, given that Navajo verb stems can only be used predicatively when marked with derivational morphology (including degree morphemes ni^{-6} and $(\acute{a})-ni^{-2}$), it seems preferable not to analyze the stem as a predicate (either of type $\langle et \rangle$ or $\langle d,et \rangle$) but rather reserve predicate status for a later stage in the derivation (i.e., after the stem has composed with either ni^{-6} or $(\acute{a})-ni^{-2}$).

An appealing alternative is found in the DECOMPOSITIONAL ANALYSIS. Under this analysis, gradable predicates are posited to be measure functions (type $\langle ed \rangle$) (Kennedy 1997, 2007b; Svenonius & Kennedy 2006). Recall from discussion in Section 1 that a gradable predicate consists of three components under the relational analysis: a measure function, a second degree argument, and an ordering relation (\geq) between the measure function and degree argument. Under the decompositional analysis, a gradable predicate is *only* a measure function. Degree morphology introduces the ordering relation (as under the relational analysis) and also

¹⁷ The obvious exception here being languages such as Japanese, Maasai, and Latvian, which always have null degree morphology. However, since all of their degree morphology is null (if degree morphology is even present at all, c.f. Sawada, to appear) and standard markers are used to introduce ordering relations, these languages do not conflict with my generalization that languages which use degree morphology to introduce ordering relations (e.g., English) have a null *pos* morpheme while all other degree morphemes are overt.

converts the measure function into a property of individuals. For example, *more/er* simultaneously converts the predicate into an expression of type $\langle d, et \rangle$ and compares the degree output by the measure function to a second degree, produced by applying the measure function to the standard of comparison, c.f. (25a). Similarly, *pos* simultaneously converts the predicate into an expression of type $\langle et \rangle$ and compares the degree produced by the measure function to a contextual standard of comparison, c.f. (25b). In the following interpretations, m is the measure function (e.g., δ_{tail}), x is the topic of comparison, and y is the standard of comparison.

- (25) a. $\|more/er\| = \lambda m \lambda y \lambda x. m(x) > m(y)$
 b. $\|pos\| = \lambda m \lambda x. m(x) \geq STND(m)$ (adapt. Kennedy 2007b)

I will not adopt the decompositional analysis in its entirety since it, like the relational analysis, credits degree morphology with introduction of the ordering relation and leaves the standard marker semantically vacuous. Given the use of locative and directional standard markers in Navajo degree constructions, this cannot be the right analysis for Navajo. However, I will incorporate into my analysis other aspects of the decompositional analysis. Under the decompositional analysis, both positive-marked predicates and predicates used in other degree constructions are equally derived from a more basic morpheme and can only be used predicatively (as properties of individuals) after composition with degree morphology. Likewise, in Navajo the verb stem must compose with derivational morphology (including degree morphemes ni^{-6} and $(\acute{a})-ni^{-2}$) before it may be used predicatively. Putting everything together, I propose that ni^{-6} and $(\acute{a})-ni^{-2}$ compose with verb stems of type $\langle ed \rangle$.¹⁸ The

¹⁸ But is $\langle ed \rangle$ the type of the stem itself? For now, it is sufficient to posit that it is, but later in the analysis (c.f. Section 4), I will add one further detail. In order to account for nominal stems (c.f., §2.4.2; Hale 2000: 88), I follow Hale (2000) in proposing that the stem, which itself may be nominal or verbal, first combines with an unpronounced verb head v . Then, $[v+stem]$ composes with derivational (e.g., degree) morphology. Under this view, the $[v+stem]$ must be the measure function.

interpretations may be revised as follows. The variable s refers to a verb stem (type $\langle \text{ed} \rangle$ expression). Composition of the stem s and a degree morpheme will produce an expression of either type $\langle \text{et} \rangle$ or $\langle \text{d,et} \rangle$.

$$(23) \quad a'. \|\text{Deg}ni^{-6}\| = \lambda s \lambda x. s(x) > \text{STND}(s)$$

$$(24) \quad a'. \|\text{Deg}('á)-ní^{-2}\| = \lambda s \lambda d \lambda x. s(x) \geq d$$

Having finalized the interpretations of ni^{-6} and $('á)-ní^{-2}$, we may now consider evidence that supports these interpretations.

2.7: Evidence for the proposed interpretations

If our intuitions about the interpretations of proposed degree morphemes ni^{-6} and $('á)-ní^{-2}$ are indeed correct, what specific behaviors should ni^{-6} and $('á)-ní^{-2}$ -marked predicates exhibit? First, if ni^{-6} has the interpretation of a *pos* morpheme, then ni^{-6} -marked predicates lack an open degree argument and, as a result, does not require that a degree expression be present to saturate or value the degree argument. By contrast, we expect a degree expression to be obligatorily present when an $('á)-ní^{-2}$ -marked predicate is used (§2.7.1). Second, given the lack of an open degree argument, we predict that measure phrase constructions (*Anna is 5ft tall*) and comparative subdeletion constructions (*The table is taller than it is wide*) cannot utilize ni^{-6} -marked predicates since both constructions require the presence of an open degree argument. Given their possession of an open degree argument, $('á)-ní^{-2}$ -marked predicates will be found in these constructions (§2.7.2). Third, we predict that degree constructions utilizing ni^{-6} -marked predicates will have interpretations distinct from those involving $('á)-ní^{-2}$ -marked predicates. The precise differences of the interpretations of these degree constructions will be discussed in §2.7.3.

2.7.1: Variation in the behavior of degree expressions based on alternation in degree morphemes

According to the interpretation of ni^{-6} given in (23a), ni^{-6} -marked predicates lack a degree argument. Thus, we predict that ni^{-6} -marked predicates do not obligatorily co-occur with degree expressions since they lack a degree argument to saturate. By contrast, an ($'á$)- ni^{-2} -marked predicate takes an individual and a degree as arguments (c.f. (24a)). We will consider four points of variation based on the alternation of ni^{-6} and ($'á$)- ni^{-2} . Throughout the discussion, I will refer to the degree expressions repeated in TABLE A.

Table A: Navajo degree expressions

Expression	translation	semantic function
a. <i>P-lááh</i>	'beyond P'	more than
b. <i>P-'oh</i>	'short of P'	less than
c. <i>DP+gi</i>	'at DP'	equal to
d. <i>P-ee</i>	'with P'	equal to
e. Measure phrase	---	---
f. <i>haa</i>	'how, what'	<i>wh</i> -word
g. ' <i>ayóo</i>	'very'	intensifier

2.7.1.1: Obligatoriness of the degree expression

The first point of variation dependent on prefixation concerns the obligatory presence of a degree expression. Predicates marked with ($'á$)- ni^{-2} can never appear unaccompanied by a degree expression, recognized by YM for the first three degree expressions given in TABLE B (1987: g192).¹⁹ As seen in (26a-c), the degree expression cannot be omitted. If the predicate is not accompanied by another degree expression, then '*ayóo* must be present. This is true when ($'á$)- ni^{-2} -marked predicates are used predicatively (26b) and attributively (26c).

- (26) a. *'*ánísnééz*
 '*á-ní⁻²-1sgS-tall*
 ('I am tall in a relative or comparative sense.')

¹⁹ The only exception to this generalization is the comparative subdeletion construction (§2.7.2.2). As will be shown in §2.7.2.2, given the semantics standardly proposed for comparative deletion constructions, this is expected. YM (1987) do not discuss comparative subdeletion constructions.

b. *Dibé yázhí ła' bináahaigo* *('ayóo) 'áníldííł *łeh*
 sheep small one-winter.pass-SUB very 'á-ní⁻²-3sgS-big usually
 'A lamb is usually big when it is a year old.' (YM 1987: d116)

c. *Joot yee ndaanéhígíí t'áátá'í* *('ayóo) 'áníłnééz *léí'*
 ball.team just.one very 'á-ní⁻²-3sgS-tall DET
t'áá bízhá bik'ehí
 just 3sgO-by 3sgO-according.to
 'The real tall player on the ball team needs no help --- has everything his own way.'
 (YM 1987: d715)

By contrast, *ni*⁻⁶-marked predicates optionally take a limited range of degree expressions (a-c and f-g in TABLE B in §2.4).²⁰ Omission of the degree expression leaves behind a grammatical declarative statement, as shown in (27a-d). Predicates marked with *ni*⁻⁶ can also be used attributively without the presence of a degree expression, as shown in (27e).

(27) a. *Díí bilasáana 'eii bilasáana biláah* 'át'éego *nitł'iz*
 DET apple DET apple 3sgO-BEYOND 3sgS-be-SUB *ni*⁻⁶-3sgS-hard
 'This apple is harder than that apple.' (Irene Silentman, p.c.)

a.' *Díí bilasáana nitł'iz*
 this apple *ni*⁻⁶-3sgS-hard
 'This apple is hard.'

b. *Shí shichidí nihígíí bi'oh* 'át'éego *dilwo'*
 1sg. 1sg-car 2sg-COMP 3sgO-SHORT.OF 3sgS-be-SUB *ni*⁻⁶-3sgS-fast
 'Your car is not as fast as mine.' (YM 1987: g193)

b.' *Shí shichidí dilwo'*
 1sg. 1sg-car *ni*⁻⁶-3sgS-fast
 'My car is fast.'

c. *Shideezhí bimági* 'át'éego *nizhóní*
 1sg-little.sister 3g-mother-AT 3sgS-be-SUB *ni*⁻⁶-3sgS-pretty
 'My little sister is as pretty as her mother' (YM 1987: g193)

²⁰ The two degree expressions that cannot occur with *ni*⁻⁶-marked predicates are measure phrase constructions (c.f. §2.7.2.1) and the equative construction that marks the standard with the incorporated postposition *P-ee* 'with P' (§2.7.2.2).

c.' *Shideezhí nizhóní*
 1sg-little.sister *ni*⁻⁶-3sgS-pretty
 'My little sister is pretty.'

d. *Haash yit'éego 'áts'óózí*
 wh-QPRT 3sgS-be-SUB *ni*⁻⁶-3sgS-thin
 'How/why is he/she skinny?'

(Irene Silentman, p.c.)

d.' *'áts'óózí*
ni⁻⁶-3sgS-thin
 'S/he is skinny.'

e. *Shínaaí bił tsin nineez léi' naaltsoos tsits'aa'*
 1sg-older.brother 3sgO-WITH stick *ni*⁻⁶-3sgS-long DET paper box
bee yíníilt'óóh ní't'éé'
 3sgO-WITH 3'SGO-1dIS-throw.slender.object PAST
 'My older brother and I were throwing a long stick at a cardboard box.'

(YM 1987: d768)

2.7.1.2: Placement of the degree expression outside of the local clause

The second point of variation that follows form alternation in (*'á*)-*ni*⁻² and *ni*⁻⁶ is the (un)availability of locating the standard of comparison outside of the local clause. In light of the ungrammatical examples in (26), we must consider whether it is possible that the ungrammaticality arose not as a result of the absence of a degree expression, but rather because the (*'á*)-*ni*⁻²-marked predicates could not be interpreted in the absence of discourse context. However, as shown in (28), even when a potential standard of comparison is available in the surrounding discourse, ungrammaticality still results if a degree expression (minimally, *'ayóo*) does not overtly precede the (*'á*)-*ni*⁻²-marked predicate within the local clause. By contrast, *ni*⁻⁶-marked predicates (*'ánists'óózí* in (28a) and *nineez* in (28b)) are grammatical even in the absence of a degree expression in the same clause.

(28) a. *Shideezhí *('ayóo) 'áníldííl, shí 'éí 'ánists'óózí*
 1sg-younger.sister very (*'á*)-*ni*⁻²-3sgS-big 1sg TOPIC *ni*⁻⁶-1sgS-slender
 'My younger sister is chunky, but I'm slender.' (adapt. YM 1987: d117)

b. *Shádí* *nincez,* *shí* *’éí* *’ánísts’í sí*
 1sg-older.sister *ni*⁻⁶-3sgS-tall 1sg. TOPIC *ni*⁻⁶-1sgS-short
 ‘My older sister is tall, but I’m short.’ (YM 1987: d117)

In (28a), *’ánildíil* cannot have the interpretation ‘big relative to me’ by virtue of being in a clause adjacent to *shí* ‘I’, or ‘big relative to my slenderness’ by virtue of being in a clause adjacent to *’ánísts’óózí*: *’ayóo* ‘very’ must precede *’ánildíil*. This suggests that (*’á*)-*ni*⁻²-marked predicates are seeking to saturate an argument position, not just fix a contextual standard of comparison. By contrast, *ni*⁻⁶-marked predicates have no such limitation, suggesting that they, like most Navajo predicates, are fully saturated.

2.7.1.3: Locality restrictions on the degree expression

The third point of variation following from alternation in (*’á*)-*ni*⁻² and *ni*⁻⁶ is restriction on the placement of degree expressions. This point of variation may be divided into two subpoints: (i) availability of topicalization and (ii) availability of separating the degree expression with a negative particle.

First, as shown in (29a’), the degree expression modifying a *ni*⁻⁶-marked predicate may be topicalized (along with *’át’éego*) in front of the subject. By contrast, degree expressions modifying (*’á*)-*ni*⁻²-marked predicates must directly precede the predicate and may not be topicalized. Faltz (2000: 44) points out that postpositions typically must directly precede the predicate with which they are associated. Thus, the ungrammaticality of (29b’) is not unexpected. What is interesting, however, is that this locality restriction does not apply to the postpositional degree expression in (29a’). Furthermore, given the movement observed in (29a’), we know that *’át’éego* forms a constituent with the degree expression, rather than with the gradable predicate. This will be key in later discussion (§2.7.1.4 and Section 4).

- (29) a. *K'ad chidí naat'aí hosiyoalts'ft yilááh 'át'éego nidat'a'*
 now airplane speed.of.sound 3'sgO-BEYOND 3sgS-be-SUB *ni*⁻⁶-3sgS-fast
 'Now airplanes are faster than the speed of sound.'
- a'. *Hosiyoalts'ft yilááh 'át'éego k'ad chidí naat'aí nidat'a'*
 speed.of.sound 3'sgO-BEYOND 3sgS-be-SUB now airplane *ni*⁻⁶-3sgS-fast
 'Now airplanes are faster than the speed of sound.' (Ellavina Perkins, p.c.)
- b. *Shí shizhé'é bilááh 'ánísnééz*
 1sg. 1sg-father 3sgO-BEYOND 'á-*ní*⁻²-1sgS-tall
 'I'm taller than my father.' (YM 1987: d117)
- b'. * *Shizhé'é bilááh shí 'ánísnééz*
 1sg-father 3sgO-BEYOND 1sg. 'á-*ní*⁻²-1sgS-tall
 ('I'm taller than my father.') (Ellavina Perkins, p.c.)

Second, *doo* – the first half of the negative frame *doo...da* – cannot intercede between an ('á)-*ní*⁻²-marked predicate and the degree expression 'ayóo (c.f. 30a)'. By contrast, *doo* can intercede between a *ni*⁻⁶-marked predicate and 'ayóo (c.f. 30b,b')'.

- (30) a. *Shidezhé'é 'ayóo 'ánítnééz, shádí 'éí*
 1sg-father very 'á-*ní*⁻²-3sgS-tall 1sg-older.sister TOPIC
doo 'ayóo 'ánítnééz da
 NEG very 'á-*ní*⁻²-3sgS-tall NEG
- a'. * *Shidezhé'é 'ayóo 'ánítnééz, shádí 'éí*
 1sg-father very 'á-*ní*⁻²-3sgS-tall 1sg-older.sister TOPIC
 'ayóo *doo 'ánítnééz da*
 very NEG 'á-*ní*⁻²-3sgS-tall NEG
 ('My father is very tall, but my sister is not very tall.')
- b. *Shádí 'éí 'ayóo doo nidaaz da*
 1sg-older.sister TOPIC very NEG *ni*⁻⁶-3sgS-heavy NEG
 'My older sister is not very heavy (rather thin).'
- b'. *Shádí 'éí doo 'ayóo nidaaz da*
 1sg-older.sister TOPIC NEG very *ni*⁻⁶-3sgS-heavy NEG
 'My older sister is not very heavy (medium weight).'

(Irene Silentman, p.c.)

without the *go*-marked material (c.f. §2.2). As we saw in (27a-e), *go*-marked degree expressions can, as expected, be omitted when used to modify *ni*⁻⁶-marked predicates, demonstrating that the predicates are fully saturated without the degree expression. If *ni*⁻⁶ has the interpretation of a *pos* morpheme, then it would lack an open degree argument and its behavior as a fully saturated predicate is precisely as expected. By extension, if *go*-marked material is only used for adverbial modification of fully saturated predicates, then the inability of *go*-marked degree expressions to occur with an (*á*)-*ni*⁻²-marked predicate suggests that (*á*)-*ni*⁻²-marked predicates are not fully saturated.

The inability of a subordinated degree expression to modify an (*á*)-*ni*⁻²-marked predicate may be seen as a final example of a locality restriction if we posit that (*á*)-*ni*⁻²-marked predicates project a degree argument. When subordinated with *át'éego*, the degree expression would behave as an adverb, adjoining higher in the structure such that it is above the maximal projection containing the (*á*)-*ni*⁻²-marked predicate and the degree argument position that it projects. When the syntactic structures of degree constructions with (*á*)-*ni*⁻² and *ni*⁻⁶-marked predicates are discussed in §4 and §5, this observation will be incorporated into our account.

2.7.1.5: Summary

The four points of variation observed in §2.7.1 demonstrate not only that (*á*)-*ni*⁻²-marked predicates are required to co-occur with a degree expression, but also that this degree expression is subject to tight locality restrictions: the degree expression must appear in the local clause (i.e., may not be subordinated by the subordinated copula *át'éego*) and must be directly adjacent to the predicate. The obligatoriness of the degree expression is expected if (*á*)-*ni*⁻²-marked predicates have open degree arguments. Furthermore, the locality restrictions on the degree expression suggest that there is a close syntactic relation between the (*á*)-*ni*⁻²-marked predicate

and the degree expression. By contrast, when a ni^{-6} -marked predicate is modified by a degree expression at all, the degree expression is not only not subject to these tight locality restrictions, but is obligatorily marked with the subordinated copula *'át'éego*, which indicates that the degree expression is adverbial and, by extension, is modifying a fully saturated predicate.

2.7.2: Degree Constructions: Measure Phrases and Comparative Subdeletion

A second diagnostic that we can use to discern the presence of a degree argument is the availability of measure phrase constructions and comparative subdeletion constructions. Both of these degree constructions require the presence of an open degree argument. We will see that only (*'á*)- ni^{-2} -marked predicates can be used in these constructions, providing another piece of evidence in favor of the proposed interpretations.

2.7.2.1: Measure Phrase Constructions

Measure phrase constructions require the presence of a degree argument. As discussed in Section 1, when a degree-marked predicate and a measure phrase compose, the measure phrase directly saturates the degree argument. The forms in (30) reflect the relational analysis's view that gradable predicates are of type $\langle d, et \rangle$.

- (31) a. Sally is 5ft tall.
 b. $tall_{d,et}(x)(d) = \lambda d \lambda x. \delta_{tall}(x) \geq d$
 c. $tall_{d,et}(Sally)(5ft) = \lambda x. \delta_{tall}(Sally) \geq 5ft$

Given the interpretations proposed for (*'á*)- ni^{-2} and ni^{-6} , we expect that (*'á*)- ni^{-2} -marked predicates (type $\langle d, et \rangle$ expressions) can take measure phrases while ni^{-6} -marked predicates (type $\langle et \rangle$ expressions) cannot. As shown in (32), this prediction is borne out: provided that a salient measurement system is available for the predicate (e.g., degrees of length, height, etc.), any (*'á*)-

ni⁻²-marked predicate can take a measure phrase.²² By contrast, *ni*⁻⁶-marked predicates can never take a measure phrase, even when they are associated with a salient measurement system. Furthermore, in contrast to other degree constructions observed thus far, it is not possible for the measure phrase to be taken by the subordinated copula *‘át’éego*: a formal analysis will be proposed in Section 4.

- (32) a. *T’áááhádi neeznádiin ‘ánísdáás / *nisdaaz*
 one hundred ‘á-*ni*⁻²-1sgS-heavy *ni*⁻⁶-1sgS-heavy
 ‘I weigh one hundred pounds.’ (Ellavina Perkins, p.c.)
- b. *Tseebíí dahidídlo’ ‘ánítdáás / *nidaaz*
 eight pound ‘á-*ni*⁻²-3sgS-heavy *ni*⁻⁶-3sgS-heavy
 ‘It weighs eight pounds.’ (Ellavina Perkins, p.c.)
- c. *Káá’ts’íní ‘a’ltsó niyéehgo ‘éí náhást’éí dóó náá’átní’jǰí’*
 alligator all 3sgS-grow-SUB TOPIC nine and half-LOC
*ké siláagi ‘ánítnééz / *nineez*
 foot-AT ‘á-*ni*⁻²-3sgS-tall *ni*⁻⁶-3sgS-long
 ‘When an alligator is fully grown, it is nine and a half feet long.’
 (adapt. YM 1987: d492)
- d. *Dízdíin dah alzhingi ‘ánísh máál / *nismaal*
 four inch-AT ‘á-*ni*⁻²-1sgS-big.around *ni*⁻⁶-1sgS-big.around
 ‘I am forty inches around.’ (Ellavina Perkins, p.c.)

Sentence (32b) illustrates an additional point: (*‘á*)-*ni*⁻²-marked predicates are not evaluative. The predicate *‘ánítdáás* ‘to be heavy (in a relative or comparative sense)’ can be used

²² Grammaticality of *‘ánítdáás* modified by a measure phrase varied between speakers. Speakers who found the forms in (55a-c) unacceptable preferred to use the verb *dahidédlo’*, related to the verb meaning ‘to hang down from a cord.’

a. *Díí dibé yázhí t’áááhádi neeznádiin daats’í dahidédlo’*
 this lamb one hundred about 3plS-hang
 ‘These lambs weigh about a hundred pounds.’ (YM 1987: d307)

Similarly, measures of length also can be expressed without including *‘ánítnééz*:

b. *Hooghan naadzǰíí bíí shighanígíí naaniigo*
 house 3sgS-pull.about-COMP 3sgO-inside 1sgS-live-COMP crosswise-SUB
dǰǰ’ts’áadahdi ‘adécs’eez
 forty-LOC feet
 ‘The mobile home in which I live is fourteen feet wide.’ (YM 1987: d590)

whether or not the measure phrase is greater than the contextual standard of comparison: an 8 pound object is not necessarily heavy, but *‘áníłdáás* is still used. This also holds in English: when a speaker describes a man as ‘5ft tall,’ there is no requirement that the man be tall in an evaluative sense.

In Navajo, if a measure phrase is used in any construction outside of one in which it (and no other degree expression) is modifying an (*‘á*)-*ni*⁻²-marked predicate, it must be introduced through other means. In (33a), the measure phrase *6in.* is used in a differential comparative construction: although the predicate *‘áníłnééz* is (*‘á*)-*ni*⁻²-marked, the degree argument is already saturated by the degree expression *P-lááh* ‘beyond P’, leaving the measure phrase to be introduced by the postposition *P-ee* ‘with P’. In (33b), the predicate is marked with *ni*⁻⁶ and the measure phrase is introduced by the postposition *P-ááh*.

- (33) a. *Susan Mary hastáá dah alzhin (*yee) yilááh ‘áníłnééz*
 Susan Mary six inch 3sg’O-WITH 3sg’O-BEYOND *‘á-ni*⁻²-3sgS-tall
 ‘Susan is six inches taller than Mary.’ (Ellavina Perkins, p.c.)
- b. *T’ááłá’í dootł’izh (*bááh) ‘íłí*
 one blue 3sgO-towards *ni*⁻⁶-3gS-expensive
 ‘It costs one dime’ (YM 1987: d352)

Compared to other languages, the Navajo measure phrase data are remarkably regular. If an (*‘á*)-*ni*⁻²-marked predicate denotes a dimensional measurement (entries 1-10 in TABLE D) then a measure phrase can be taken without exception. By contrast, in English, Dutch, German, and French, measure phrases are only licensed for a subset of predicates with dimensional meaning, c.f. *5ft tall* vs. **100lbs heavy* (see Schwarzschild (2005) and Svenonius & Kennedy (2006) for representative discussion). The foregoing observations strongly support interpretations of *ni*⁻⁶ and (*‘á*)-*ni*⁻² in which only predicates marked with (*‘á*)-*ni*⁻² have a degree argument available for saturation by a measure phrase.

2.7.2.2: Comparative Subdeletion

Comparative subdeletion constructions, as in (34a), can be recognized by the clausal nature of the standard of comparison ('the door is wide') and the absence of degree morphology (*more/er, less, as*) in the clausal standard of comparison (Grimshaw 1987, Klein 1991, Kennedy 1997). Furthermore, comparative subdeletion constructions require the presence of two degree arguments, one introduced by the matrix gradable predicate and one introduced by the predicate in the clausal standard of comparison. Assuming the denotation of *more/er* in (34b), comparative subdeletion structures receive an interpretation along the lines of (34c).

- (34) a. The table is higher than the door is wide.
b. $\|more/er\| = \lambda d'. \lambda d''. \max(d'') > \max(d')$
c. $\max(\lambda d''. \text{the table is } d''\text{-high}) > \max(\lambda d'. \text{the door is } d'\text{-wide})$ (adapt. Vanderelst 2008)

According to the interpretation of *more*, the degree morpheme *more* orders two degrees: one degree is contributed by the matrix clause predicate (e.g., *high*) and the other degree contributed by the predicate functioning as the standard of comparison (e.g., *wide*), where both predicates are presumed to have a degree argument *d*: if either predicate does not have a degree argument (i.e., *d* is saturated by a contextual standard of comparison), then the comparative subdeletion construction should be prohibited. In Navajo, if only ('á)-ní⁻²-marked predicates have a degree argument, then we predict that only ('á)-ní⁻²-marked predicates will occur felicitously in comparative subdeletion constructions. Furthermore, we predict that ('á)-ní⁻²-marked predicates should occur both in the matrix clause and as the complement of the standard marker, since each of the two compared degree arguments is contributed by a gradable predicate.

These predictions are borne out by the examples below. In all examples, note that the predicate functioning as the standard of comparison is obligatorily marked by a complementizer *-ígíí* or *-í*. These complementizers typically nominalize what they mark (c.f. §2.2, Schaubert

1979). Furthermore, while we have seen thus far that *‘ayóo* ‘very’ must precede (*‘á*)-*ní*-²-marked predicates in the absence of another degree construction, the (*‘á*)-*ní*-²-marked predicate functioning as the standard of comparison cannot be preceded by *‘ayóo* (Ellavina Perkins and Irene Silentman, p.c.). This is as expected, since the comparative subdeletion construction compares two degree arguments: if one of the degree arguments is already saturated (as by *‘ayóo*), it will no longer be available for use in the construction.

The following examples show that the same predicate *‘áníłtso* ‘to be large (in a relative or comparative sense)’ may be used in conjunction with adverbs *naaniigo* ‘crosswise’ and *náásee* ‘lengthwise.’ It is also possible to use (*‘á*)-*ní*-²-marked predicates denoting particular dimensions, such as length or width, as shown in (35b). As shown in (36a,b), it is also possible for each predicate to have a different subject.²³

- (35) a. *Díí naaltsoos naaniigo t’áá náásee ‘áníłtsooígí*
 DET book crosswise-SUB just lengthwise ‘*á-ní*-²-3sgS-large-COMP-AT
‘áníłtso
‘á-ní-²-3sgS-large
 ‘This book is as long as it is wide.’ (YM 1987: g193)
- b. *Díí naaltsoos naanii ‘áníłtééłígí yilááh ‘áníłnééz*
 DET book crosswise ‘*á-ní*-²-3sgS-wide-COMP 3sg’O-BEYOND ‘*á-ní*-²-3sgS-long
 ‘This book is longer than it is wide.’ (Ellavina Perkins, p.c.)
- (36) a. *Bikáá’adání ch’é’étiin ‘áníłtééłígí yilááh ‘áníłnééz*
 table doorway ‘*á-ní*-²-3sgS-wide-COMP 3sg’O-BEYOND ‘*á-ní*-²-3sgS-long
 ‘The table is longer than the doorway is wide.’ (Ellavina Perkins, p.c.)

²³ In English, the comparative subdeletion construction is also characterized by the ability of the clausal standard of comparison (e.g. ‘The door is wide’) to stand alone. Given that the degree expression must be in the same clause as the (*‘á*)-*ní*-²-marked predicate (c.f. §2.7.1) we would not expect a clausal standard of comparison (e.g., *‘áníłtsooí*) to stand alone. Preliminary discussion with speakers reveals this to be the case: even when complementized (or nominalized), *‘áníłtsooí* cannot be used in isolation. Of course, the English clausal standard of comparison ‘The door is wide’ (where ‘wide’ is not marked with *pos* but rather has the form *d*-wide) cannot, strictly speaking, stand alone either, as Grimshaw (1987) and Kennedy (1997) write. The degree argument *d* still must be assigned a value, a task accomplished here though the degree morpheme *more/er*. Thus, the form of the comparative subdeletion construction in Navajo is fully in line with what we expect.

- b. *Ch'é'étiin bikáá'adání 'ánítnéézígi 'áníttéél*
 doorway table 'á-ní⁻²-3sgS-long-COMP-AT 'á-ní⁻²-3sgS-wide
 'The doorway is as wide as the table is long.' (Ellavina Perkins, p.c.)

As with the measure phrase construction, comparative subdeletion constructions show that (*á*)-*ní*⁻²-marked predicates are not evaluative: there is no requirement that the table, book, or doorway be long or wide in an evaluative sense, only that their width and length be in the relation denoted by the standard marker. As predicted, comparative subdeletion constructions utilizing *ní*⁻⁶-marked predicates were rejected as ungrammatical. Given that *ní*⁻⁶-marked predicates lack the degree argument that must be available for comparison in this degree construction, this finding supports the proposed interpretation for *ní*⁻⁶.

- (37) **Díí naaltsoos niteelígíí yilááh 'ánítnééz*
 DET book *ní*⁻⁶-3sgS-wide-COMP 3sg'O-BEYOND 'á-ní⁻²-3sgS-long
 ('This book is longer than it is wide.') (Ellavina Perkins, p.c.)

Thus far, we have only considered (*á*)-*ní*⁻²-marked predicates with strictly dimensional meaning (e.g., 'big', 'tall', 'heavy'). When asked to translate comparative subdeletion constructions with predicates with non-dimensional meanings, speakers found the results confusing or unnatural, even when predicates used could be marked with (*á*)-*ní*⁻², such as '*ádóolwo*' 'fast in a relative or comparative sense,' '*ábóodziil*' 'strong in a relative or comparative sense,' or '*ánóoshóní*' 'pretty in a relative or comparative sense.' For completeness, the following examples show two forms suggested by speakers given the same English sentence.²⁴

- (38) a. (?) *Mary bitsííft yilááh 'át'éego bitsxe'*
 Mary 3sg-fastness 3'sgO-BEYOND 3sgS-be-SUB *ní*⁻⁶-3sgS-strong
 'Mary is stronger than she is fast.' (Ellavina Perkins, p.c.)

²⁴ At this point, it is unclear whether such examples should be viewed as instances of metalinguistic comparison or as true comparative subdeletion constructions. For discussion of 'comparative subdeletion' constructions that use non-dimensional predicates and receive degree-less, metalinguistic readings, please see Giannakidou & Stavrou (m.s.).

b. (?) *Mary* ‘*áyóo* ‘*ábóodziil* *dilwo’ígíí* *biláahdi*
 Mary very ‘*á-ní⁻²-3sgS-strong* *ni⁻⁶-3sgS-fast-COMP* 3sgO-BEYOND-LOC
 ‘Mary is stronger than she is fast.’ (Irene Silentman, p.c.)

Several comments can be made about (38a,b). First, in lieu of marking a predicate denoting ‘fast’ with *-ígíí*, the noun *bitsííft* ‘her fastness’ is used in (38a). Second, when the predicate is not marked with (*á*)-*ni⁻²*, as in *bitsxe* ‘she is strong,’ *át’éego* is used as expected. Third, the word order in (38b) varies from the ordering we have seen previously: the standard of comparison *dilwo’ígíí biláahdi* is extraposed to the right of *áyóo ‘ábóodziil*. In §2.7.1, flexible word order was observed for degree constructions involving *ni⁻⁶*-marked predicates. In this example, the standard of comparison does not have to precede *‘ábóodziil*, perhaps both because *áyóo* is already occupying the syntactic position that would typically be filled by the standard of comparison, and because composition of *‘ábóodziil* with *áyóo* has already saturated the predicate’s degree argument, making the predicate of the same type as a *ni⁻⁶*-marked predicate.²⁵ Beyond these observations, I leave discussion of comparative subdeletion-type constructions with non-dimensional predicates to future research.

2.7.3: Different interpretations of degree constructions

In §2.7.2, I took the inability of *ni⁻⁶*-marked predicates to occur in certain degree constructions as evidence that they lack a degree argument, while (*á*)-*ni⁻²*-marked predicates have a degree argument. In this section, I will consider the semantics of four degree

²⁵ Modifying the degree argument of *‘ábóodziil* with *áyóo* ‘very’ produces an interpretation along the lines of ‘Mary is strong’, which entails that Mary’s strength exceed a standard degree of tallness. Judging from these few examples, it appears that even when a predicate with a non-dimensional meaning like *‘ábóodziil* ‘to be strong (in a comparative or relative sense)’ is marked by (*á*)-*ni⁻²*, the speaker modifies the construction such that the predicate must still entail the positive. For discussion of comparative subdeletion constructions with non-dimensional predicates – and the evaluativity required of each predicate – see Klein (1991) and Moltmann (to appear).

constructions in which both *ni*⁻⁶ and (*'á*)-*ni*⁻²-marked predicates can be used: (i) the intensifier '*ayóo* construction; (ii) the *-gi*-marked equative construction; and (iii) the *P-lááh/P-'oh* (>,<) comparative constructions. I will note the differences in the semantics of these constructions that result when (*'á*)-*ni*⁻² or *ni*⁻⁶ is used.

2.7.3.1: Intensifier constructions with and without open degree arguments

Thus far, I have referred to '*ayóo* as an intensifier, indicating that the topic of comparison exhibits the property denoted by the gradable predicate to a high degree. This view of '*ayóo* seems to capture most instances of its use, both with (*'á*)-*ni*⁻² and *ni*⁻⁶-marked predicates, c.f. (39). When '*ayóo* modifies a *ni*⁻⁶-marked predicate as in (39b), it obligatorily receives a high degree reading. This is expected given the proposed interpretation for *ni*⁻⁶ in which reference to a standard degree is part of the predicate's basic meaning: the intensifier '*ayóo* can act on this standard degree, raising it to a high degree.

- (39) a. *Ñléí hastiin bizooł dah dijoolígí 'ayóo 'áníftsxó*
 DET man 3sg-windpipe 3sgS-round-COMP very '*á-ni*⁻²-3sgS-large
 'That man has a huge Adam's Apple.' (YM 1987: d144)
- b. *Nástáán łá' dzídaashtijh ní'téé' 'ayóo ndaaz*
 log DET 1sgS-put.slender.object.in.fire PAST very *ni*⁻⁶-3sgS-heavy
lá, 'áko shimá shíká'celwod
 EVID but 1sg-mother 1sgO-3sgS-help-P
 'I was going to put a log into the fire but it was too heavy so my mother helped me.'
 (YM 1987: d358)

However, in certain instances of modification an (*'á*)-*ni*⁻²-marked predicate by '*ayóo*, the degree construction does not receive a high degree reading.²⁶

- (40) a. *Shínaaí 'ayóo 'ánítdáás, shí' éí 'áníszólí*
 1sg.older.brother very '*á-ni*⁻²-3sgS-heavy 1sg. TOPIC *ni*⁻⁶-1sgS-light
 'My big brother is heavy, (but) I'm light in weight.' (YM 1987: d117)

²⁶ At this point, it is unclear when '*ayóo* contributes a positive vs. a high degree reading to an (*'á*)-*ni*⁻²-marked predicate. I leave this question for future research.

b. *Dibé yázhí ła' binááhaigo 'ayóo 'áníldííl łeh*
 sheep small one-winter.pass-SUB very 'á-ní⁻²-3sgS-big usually
 'A lamb is usually big when it is a year old.' (YM 1987: d116)

In (40a), 'my younger sister' is not necessarily chunky to a high degree: rather, she is chunky relative to a contextual standard of 'chunkiness.' Likewise, in (40b), a lamb is not big to a high degree when it is a year old: rather, it is simply big, or full-grown. Could we view 'ayóo as an analytic *pos* morpheme that compares the degree argument (introduced by ('á)-ní⁻²) to a contextual standard of comparison?

In fact, this is the analysis has been posited for Mandarin, where the intensifier *hen* is ambiguous between a high-degree and semantically bleached positive-degree reading (Li & Thompson 1981). Given that Mandarin gradable predicates are taken to be uniformly of type <d,et>, when *hen* modifies a gradable predicate used declaratively, it saturates the degree argument and compares it to a contextual standard of comparison, just as is done by the *pos*-morpheme under the relational analysis (Sybesma 1999, Grano 2008).²⁷ In (41), Zhangsan is not required to be tall to a particularly high degree: rather, Zhangsan is tall relative to a contextual standard.

(41) *Zhangsan hen gao*
 Zhangsan very tall
 'Zhangsan is tall' (Sybesma 1999: 27)

Keeping in mind the precedent set by *hen* in Mandarin, the ambiguity of 'ayóo when used with ('á)-ní⁻²-marked predicates may be accounted if we adopt the interpretations proposed for

²⁷ A null *pos* morpheme is also posited by Grano (to appear) to explain the evaluative readings still present in non-declarative contexts when *hen* is not used. Once again, the precedent of two *pos*-morphemes in Mandarin (a dedicated *pos* morpheme and semantically bleached intensifier) suggests that we may be on the right track for Navajo, where the range of *pos* morphemes would also consist of a dedicated *pos* morpheme (*ni*⁻⁶) and a semantically bleached intensifier ('ayóo).

(*á*)-*ni*⁻² and *ni*⁻⁶. If an (*á*)-*ni*⁻²-marked predicate has an open degree argument rather than a contextually determined standard degree, *áyóo* must accomplish two tasks for interpretation as an intensifier: it must first relate the degree argument to a contextual standard of comparison, and then raise the degree argument above this standard. Mandarin *hen* must also accomplish these tasks. Although it is unclear what factors favor contribution of a high-degree reading from *áyóo*, the ambiguity of *áyóo* and *hen* may be linked to the relative difficulty of accomplishing both tasks. By contrast, if a *ni*⁻⁶-marked predicate already makes reference to a contextual standard of comparison, then *áyóo* has only to select the range of values that exceed the contextual standard of comparison.

2.7.3.2: *Wh*-questions with and without open degree arguments

The next degree construction to be considered is the *wh*-construction utilizing *haa* ‘how’. This degree construction receives two different readings based on alternation in (*á*)-*ni*⁻² and *ni*⁻⁶, which we will term the degree question (DQ) reading and the descriptive reading. The DQ reading is: ‘how *g* is *X*?’ where *X* is the topic of comparison and *g* is a gradable predicate. The descriptive reading comes in several flavors, including causation (i.e., ‘how is it that *X* is *g*?’). As seen throughout this section, when a degree expression (such as *haa*) is used with a *ni*⁻⁶-marked predicate, the degree expression is obligatorily subordinated with the subordinated copula, here *yit’éego* (rather than *át’éego*), c.f. discussion in §2.7.1.4.²⁸

Following standard assumptions, the DQ reading for the *wh*-construction requires a degree variable to bind (Klein 1980; Kennedy 1997: 117; Rullmann 1995).²⁹ By contrast, the

²⁸ I hypothesize that there is no difference in syntax or semantics between *yit’éego* and *át’éego*. However, it is interesting that *yit’éego* is consistently used in the *wh*-construction while *át’éego* is used to subordinate all other degree expressions. I leave further exploration of this matter to future research.

²⁹ Given the sentence in (a) with the meaning in (b), Rullmann (1995) posits the “quasi-logical” interpretation shown in (c), where ? is a degree operator.

descriptive reading does not have an interpretation that suggests or requires the presence of a degree variable, but rather which makes reference to a contextual standard of comparison. Intuitively, the speaker seems to be presupposing that the topic of comparison exhibits the gradable predicate *g* to an evaluative degree: the *wh*-word asks about the situation as a whole, in particular how or why the situation arose.

Examples (41a-c) demonstrate these differences in semantic interpretation based on alternation of (*á*)-*ni*⁻² and *ni*⁻⁶.

- (41) a. *Haa níftso?*
 Wh *ní*⁻²-3sgS-large
 ‘How large is it?’ or ‘What size is it?’ (DQ reading)
- b. *Haanífts’óóz*
 wh-*ní*⁻²-3sgS-thin
 ‘How skinny is s/he?’ (DQ reading)
- c. *Haash yit’éego áfts’óózí*
 wh-QPRT 3sgS-be-SUB *ni*⁻⁶-3sgS-thin
 ‘Why is s/he skinny?’ or ‘How is it that s/he is skinny?’ (Descriptive reading)
 ?? ‘How skinny is s/he?’ (DQ reading)
 (Irene Silentman, p.c.)

According to the speaker interviewed, the DQ reading for (41c) is much less readily available than the descriptive reading. Under the descriptive reading, the question is not to what degree the individual is skinny (the speaker presupposes this), but rather *why* the individual came to be skinny. By contrast, the same stem *ts’óóz* is used in (41c), but this time is marked with *ní*⁻² rather than *ni*⁻⁶. The predicate still has an evaluative reading – possible contexts for (41c) include asking for the width of a belt or a thin cut of meat (Ellavina Perkins, p.c.) – but it nevertheless receives a DQ reading: the descriptive reading is entirely unavailable.

(a) How tall is John?

(b) What is the maximal degree *d* such that John is *d*-tall?

(c) ?d[d = max(λd'[John is d'-tall])]

(Rullmann 1995: 136)

For instance, the predicate *deesk'aaz* ‘cold’ in (43) belongs to the class of neuter perfective predicates and, as such, can never be marked with either *ni*⁻⁶ or (*á*)-*ni*⁻² (c.f. Footnote 8).

However, (43) receives an evaluative DQ reading like (41b).

- (43) *Haánee'* *yit'éego* *deesk'aaz,* *hóla*
wh-wait.and.see 3sgS-be-SUB 3sgS-cold do.not.know
‘I don't know how cold it is, I don't know.’
(DQ reading)
(YM 1987: d429)

This is expected since if DQ readings were only available for (*á*)-*ni*⁻²-marked predicates, speakers would be extremely limited in the predicates that they could ask questions about. Further research is necessary to pinpoint which factors are responsible for deciding when a *wh*-construction with a *ni*⁻⁶-marked predicate receives a DQ vs. descriptive reading. It seems plausible that the descriptive reading will be preferred when the predicate could be – but is not – marked with (*á*)-*ni*⁻². For instance, the descriptive reading may have been preferred for (41c) because the predicate could have been marked with *ni*⁻², c.f. (41b), but was not.

In fact, a DQ reading is also available when *haa yit'éego* takes a full clause (proposition of type <t>), such as the comparative construction *Shilááh 'ánóodziil* ‘you are stronger than me’ in (44).

- (44) *Haalá* *yit'éego* *shilááh* *'ánóodziil*
wh-QPRT 3sgS-be-SUB 1sgO-BEYOND '*á-ni*⁻²-2sgS-strong
‘How much stronger are you than me?’
(DQ reading)
(YM 1987: d130)

A priori, we would expect (44) to have received a descriptive reading, such as ‘How is it, why are you stronger than me?’. How do we account for the DQ reading available in (44)? I will take up this question in Section 4 when I discuss the semantic contribution of *yit'éego/át'éego* such that the subordinated copula may facilitate a degree reading to other degree-less predicates and propositions.

To summarize, only (*á*)-*ní*⁻²-marked predicates with dimensional meaning obligatorily receive a degree reading in *wh*-constructions. When *haa yit'éego* is used, *ni*⁻⁶-marked predicates preferably receive the descriptive reading but may, in certain contexts, receive a DQ reading. Taken together with the other pieces of evidence presented throughout §2.7, the data presented in this section supports the interpretations proposed for (*á*)-*ní*⁻² and *ni*⁻⁶.

2.7.3.3: Equatives with and without open degree arguments

As discussed in §2.3, equative meaning may be expressed in Navajo by marking the standard of comparison with locative enclitic *-gi* ‘at’. However, based on the alternation in (*á*)-*ní*⁻² and *ni*⁻⁶, otherwise identical ‘equative’ constructions receive distinct readings. As shown in (45), if the predicate is marked with (*á*)-*ní*⁻², the equative construction receives the reading ‘X is as *g* as Y,’ which I will call the ‘exact’ equative reading. The equation of *g*-ness may be figurative, c.f. (45a), or it may be literal, c.f. (45b). However, what is important is that the topic and standard of comparison express *g* to the same degree. Furthermore, neither the topic nor the standard of comparison is required to express *g* in an evaluative sense by virtue of the predicate. In (41a), since ‘Mr. Yazhí’s wife’ is compared to an elephant in terms of weight, she is certainly a heavy individual. By contrast, (45b) is true no matter what the heights of ‘you’ and ‘I’ are, provided that they are equal. This suggests that if the topic of comparison expresses *g* to a high degree, as in (45a), this is because the standard of comparison denotes a high degree, not because an evaluative reading is uniformly imposed on the predicate.

- (45) a. *Hastiin Yazhí be'esdzáán chííh yee 'adilohii-gi 'ánídáás*
 Mr. Yazhí 3sg-wife elephant-AT 'á-ní⁻²-3sgS-heavy
 ‘Mr. Yazhí’s wife is as heavy as an elephant.’ (YM 1987: g192)
- b. *Ni-gi 'ánísnééz*
 2sg-AT 'á-ní⁻²-1sgS-tall
 ‘I am as tall as you.’ (Ellavina Perkins, p.c.)

By contrast, equative constructions with *ni*⁻⁶-marked predicates can receive the reading ‘X is *g* like Y,’ which I will refer to as the ‘inexact but evaluative reading.’ Following speakers’ judgments on the truth conditions of the sentences in (46) vs. (45), the ‘inexact but evaluative’ reading varies in two ways from the ‘exact’ equative reading discussed above. First, an evaluative reading is imposed on *g*. For instance, (46a) entails that both ‘he’ and ‘his older brother’ are fast runners: their fastness exceeds some contextual standard of comparison. In (46b), ‘I’ and ‘you’ are both tall individuals, relative to some contextual standard of comparison. Second, the topic and standard of comparison are not required to express *g* to an equal degree, either figuratively or literally. In (46b), the sentence was still identified as felicitous when a noticeable gap (5 inches) separated the heights of the two individuals, provided that both individuals were ‘tall’ (taller than 5ft 10in). By contrast, (45b) was only acceptable if ‘I’ and ‘you’ were tall to precisely the same degree: any variation in height resulted in infelicity for the speaker interviewed. However, (45b) was still acceptable even in the case that ‘I’ and ‘you’ were both short (5ft).

(46) a. *Bínaaí ‘át’éhé-gi ‘át’éego dilwo’*
 3sg-older.brother-AT 3sgS-be-SUB *ni*⁻⁶-3sgS-fast
 ‘He’s a fast runner just like his older brother.’ (YM 1987: d369)

b. *Ni-gi ‘át’éego nisneez*
 2sg-AT 3sgS-be-SUB *ni*⁻⁶-1sgS-tall
 ‘I am tall like you.’ (YM 1987: g193)

Action-denoting predicates may also be used with *-gi* where the degree expression is subordinated with ‘*át’éego* (c.f. §2.7.1.4). As discussed in §2.7.1.4, the obligatory use of ‘*át’éego* both with *ni*⁻⁶-marked and action-denoting predicates – proposed to be fully saturated – suggests that *ni*⁻⁶-marked predicates are also fully saturated. This was taken as evidence in favor of the proposed *pos* interpretation of *ni*⁻⁶.

- (47) a. *T'áa shí yáshti'í-gi 'át'éego yáfti'*
 just 1sg 1sgS-talk-COMP-AT 3sgS-be-SUB 3sgS-talk-I
 'He talks just like I do.'
- b. *Sitsilí shí-gi 'át'éego nahafá*
 1sg-younger.brother 1sg-AT 3sgS-be-SUB 3sgS-perform.ceremony-I
 'My younger brother can perform ceremonies just like me.' (YM 1987: d369)

Given the variation in meaning observed thus far, we can say that an 'exact' equative reading is only available when the predicate is marked with (*'á*)-*ni*⁻². All other predicates (both *ni*⁻⁶-marked and action-denoting) receive the 'inexact but evaluative' equative reading. What can this variation in readings tell us about the validity proposed interpretations? First, the 'exact' equative reading is expected if a predicate has an open degree argument that can be precisely valued through composition with a standard of comparison. Also, since we would be dealing with an open degree argument, we do not expect an evaluative reading to be imposed on the gradable predicate. The semantics of the 'exact' equative construction is best accounted for if we assumed the proposed interpretation of (*'á*)-*ni*⁻².

As for the 'inexact but evaluative' reading, we would predict this reading if the degree morpheme made reference to a contextual standard of comparison such that an evaluative reading is imposed in the predicate. Furthermore, the topic and standard of comparison do not express *g* in terms of each other – as occurred in 'exact' equatives – but rather they both express *g* to a positive (but not necessarily equivalent) extent. The semantics of the 'inexact but evaluative' equative construction supports the interpretation proposed for *ni*⁻⁶ since it, unlike (*'á*)-*ni*⁻², references a contextual standard of comparison and lacks an open degree argument. both points are expected if the proposed interpretation of *ni*⁻⁶ is correct (given that the interpretation makes reference to a contextual standard of comparison rather than introduce an open degree argument).

2.7.3.4: Comparatives with and without open degree arguments

The effect of alternation between (*á*)-*ni*⁻² and *ni*⁻⁶ in comparative constructions is not as immediately apparent as the effect observed for other degree constructions. The primary difference in meaning is that, once again, when *ni*⁻⁶ marks the predicate, the topic of comparison is required to express gradable predicate *g* to a degree that equals or exceeds a contextual standard of comparison. In (48a), the topic of comparison ‘I’ is not required to be tall in an evaluative sense. Specifically, given a discourse context in which ‘I’ is an adult woman, ‘I’ in (48a) must be taller than *5ft 8in* – a height that the speaker and I agreed is ‘tall for a woman’ – as well as taller than ‘my mother.’ No such restriction is imposed on the topic of comparison in (48b), which was judged as felicitous even when ‘I’ was *4ft 11in*, a height mutually agreed to be ‘short.’³⁰

(48) a. *Shimá bilááh ‘át’éego nisneez*
 1sg-mother 3sgO-BEYOND 3sgS-be-SUB *ni*⁻⁶-1sgS-tall
 ‘I am taller than my mother’, ‘I am more tall than my mother’

b. *Shimá bilááh ‘ánísnééz*
 1sg-mother 3sgO-BEYOND ‘á-*ni*⁻²-1sgS-tall
 ‘I am taller than my mother.’

(Ellavina Perkins, p.c.)

The semantics of sentences like (48a) will be discussed in greater detail in §5.3.3. However, we may briefly preview the analysis to consider how evaluativity may be manifested (and accounted for) in degree constructions. I propose the predicate modification is the process at work in the comparative relation expressed in (48a), rather than either function application (impossible since there is no open argument associated with *ni*⁻⁶-marked predicates: function application is, however, will be the operative process for degree constructions with (*á*)-*ni*⁻²-marked predicates) or implicit comparison (Beck et al. 2004; Kennedy, in press). In implicit

³⁰ It is unclear whether ‘my mother’ is also required to express *g* to an evaluative degree.

comparison, *pos*-marked predicates are used and the contextual standard of comparison (STND(s)) is replaced by the degree or individual introduced by the standard of comparison (Kennedy, in press; see also Beck et al. 2004 for a similar analysis in which the individual introduced by the standard marker functions as a pragmatic ‘context setter’). The semantics of implicit comparison may be approximated in English as follows:

(49) Compared to Anna, Sally is tall.

In (49), since the standard of comparison is ‘Anna,’ there is no requirement that ‘Sally’ be tall in an evaluative sense, such as compared to other adult women. However, as stated above, sentence (48a) was judged infelicitous in contexts where ‘I’ was not evaluatively tall, even if ‘I’ still exceeded the height of ‘my mother’ (i.e., ‘I’ is *5ft 3in* tall and ‘my mother’ is *5ft 1in* tall). This indicates that the contextual standard of comparison is not being replaced by the height of ‘my mother.’ Sentences such as (48a) receive the interpretation, ‘I am tall (at or beyond a contextual standard of comparison) *and* I am taller than my mother.’ In Section 4, I will propose that Predicate Modification is the operative compositional process in (48a).

The effect of the evaluativity introduced by *ni*⁻⁶ can also be seen in the following pair of examples. When asked to translate ‘My car is smaller than your car,’ speakers found use of the diminutive, *ni*⁻⁶-marked predicate ‘*áts’ísí* ‘small’ to be infelicitous, c.f. (50a). Rather, an (‘á)-*ni*⁻²-marked predicate and the standard marker *P-’oh* ‘short of P’ were preferred, c.f. (50b). Sentence (50a) was cited infelicitous because it entails that ‘my car’ is small, and not just relative to ‘your car’: even if ‘my car’ is small to other cars, ‘*áts’ísí* was still found unacceptable. By contrast, given our proposal that the (‘á)-*ni*⁻²-marked predicate in (50b) has an open degree

argument, the only requirement for felicity in (50b) is that the degree to which ‘my car’ is large (or, ‘has size’) is less than the degree to which ‘your car’ is large.³¹

(50) a. ?**Shichidí nichidí bilááh* ‘át’éego ‘áts’ísí
 1sg-car 2sg-car 3sgO-BEYOND 3sgS-be-SUB *ni*⁻⁶-3sgS-small
 (‘My car is smaller than yours.’)

b. *Shichidí nichidí bi’oh* ‘ánítso
 1sg-car 2sg-car 3sgO-SHORT.OF ‘á-*ní*⁻²-3sgS-large
 ‘My car is smaller than yours.’ (Lit: My car is less big than yours)
 (Irene Silentman, p.c.)

Comparative constructions with *ni*⁻⁶-marked predicates receive readings that we would expect if reference to a contextual standard of comparison were part of the predicate’s meaning. By contrast, comparative constructions with (‘á)-*ní*⁻²-marked predicates place no requirements of evaluativity on the topic of comparison. Once again, the proposed interpretation for each degree morpheme is supported by the semantics of degree constructions.

2.7.4: Interim summary

Below, TABLE E summarizes the evidence presented in favor of the interpretations proposed for *ni*⁻⁶ and (‘á)-*ní*⁻².

³¹ Rett (2008) notes that English gradable predicates with diminutive meanings trigger evaluative readings in degree constructions where evaluativity is not expected, notably equative constructions. Sentence (a) makes reference to a contextual standard of shortness, entailing that Amy is short.

a. Amy is as short as Betty. (Rett 2008: 2)
 Rett attributes the unexpected evaluative reading to a degree modifier EVAL. However, for our purposes, it is interesting simply to note in passing that diminutive predicates in English (which are assumed to be of the same <d,et> as other gradable predicates) impose evaluative readings: this evaluativity appears to be ‘hard coded’ into Navajo through marking of diminutive predicates with *ni*⁻⁶.

Table E: Variation in predicate behavior based on prefixation

$\ ni^{-6}\ = \lambda_{S_{ed}}\lambda_{X.S}(x) > STND(s)$	$\ (‘á)-ni^{-2}\ = \lambda_{S_{ed}}\lambda_d\lambda_{X.S}(x) > d$
<p>i. <i>Degree expressions:</i></p> <ul style="list-style-type: none"> a. Placement of degree expression. relatively free b. Predicate can appear without degree expression <p>ii. <i>Unavailability of certain degree constructions, namely:</i></p> <ul style="list-style-type: none"> a. measure phrases b. comparative subdeletion <p>iii. <i>Semantics of degree constructions:</i></p> <ul style="list-style-type: none"> a. ‘ayóo always receives intensifier reading b. Descriptive reading primarily available for <i>wh</i>-construction, degree reading secondary c. ‘Exact’ equatives d. Evaluative comparatives 	<p>i. <i>Degree expressions:</i></p> <ul style="list-style-type: none"> a. Placement of degree expression. subject to locality restrictions b. Predicate cannot appear without degree expression <p>ii. <i>All degree constructions available, including:</i></p> <ul style="list-style-type: none"> a. measure phrases b. comparative subdeletion <p>iii. <i>Semantics of degree constructions:</i></p> <ul style="list-style-type: none"> a. ‘ayóo receives <i>pos</i> reading or intensifier reading b. Only degree reading available for <i>wh</i>-construction, descriptive reading not available c. ‘Inexact but evaluative’ equatives d. Non-evaluative comparatives

Although future research will undoubtedly uncover more points of variation, particularly with respect to the semantics of degree constructions, the findings given in TABLE E are most directly accounted for if we propose that (‘á)-*ni*⁻² introduces an open degree argument, while *ni*⁻⁶ introduces a contextual standard of comparison in lieu of an open degree argument.

2.8: Interim conclusions: challenges for the relational analysis

In Section 2, I provided a detailed descriptive account of Navajo degree constructions, showing not only that standard markers (postpositions and enclitics with locative or directional meaning) introduce the ordering relations, but also that alternation in degree morphemes *ni*⁻⁶ and (‘á)-*ni*⁻² affects the syntactic structure and semantic interpretation of the degree constructions in which these predicates are used.

What are the implications of these findings for the relational analysis of gradable predicates? We cannot maintain the relational analysis’s central tenet that all gradable predicates

are in their most basic form type $\langle d, et \rangle$ expressions. First, given that the vast majority of gradable predicates function as *pos*-marked predicates (i.e., those marked with *ni*-⁶) it seems uneconomical to propose that all of these predicates originated with degree arguments, and that all of these degree arguments were saturated by a *pos* morpheme. This view is particularly untenable in light of the equal (or greater) morphological markedness of predicates that have an open degree argument (i.e., those marked with (*á*)-*ni*-²). Second, according to the proposed interpretations of each degree morpheme – and supported by the precedent set in the decompositional analysis (c.f. Kennedy 1997) – predicates are ultimately properties of individuals of type $\langle d, et \rangle$ or $\langle et \rangle$, but expressions of both types are derived from a more basic piece, the stem, which I have proposed to be of type $\langle ed \rangle$. To summarize, the Navajo data shows that (i) possession of a degree argument and (ii) status as a property of an individual are both achieved through composition of the stem with degree morphology, and are not, as held by the relational analysis, basic to the meaning of gradable predicates.

The second challenge that the Navajo data pose for the relational analysis is that both degree morphology and standard markers are semantically non-vacuous: degree morphemes determine the semantic type of the gradable predicate while standard markers introduce the ordering relation. Recall from discussion at the end of Section 1 that the relational analysis has only been applied to languages with *either* semantically vacuous degree morphology *or* semantically vacuous standard markers. For instance, English is proposed to use degree morphology to introduce the ordering relation and have vacuous standard markers (e.g., *than* or *as*). Japanese, on the other hand, is thought (under some analyses) to lack degree morphology entirely and introduce the ordering relation with standard markers (e.g., *yori* ‘from’). Part of the challenge for the relational analysis is that given the assumption that predicates are

fundamentally of type $\langle d, et \rangle$, there is only one semantic task – introduction of the ordering relation – left to be completed. If only one semantic task is available, then it is logical that only one component – either the degree morphology or the standard marker – would be necessary to fill this role.

Or is this the whole story of the roles that standard markers and degree morphology can play in the semantics of degree constructions? In Section 3, I will discuss evidence from other languages suggesting that cross-linguistically, the standard marker plays a greater role in the semantics of degree constructions while degree morphology has a reduced role. When seen from this angle, the Navajo data confirm (rather than contradict) cross-linguistic patterns.

3: Integrating the data into a theoretical analysis

3.1: Introduction

In Section 2, Navajo was found to conflict with the relational analysis for two reasons: (i) gradable predicates are not fundamentally or universally of type $\langle d, et \rangle$, and (ii) both degree morphology and standard markers contribute to the semantics of degree constructions. In Section 3, I integrate the Navajo data into a theoretical analysis and consider how the Navajo data reflect broader cross-linguistic patterns in degree constructions and behavior of gradable predicates. I take as my starting point the analysis sketched by Kennedy (2007a), which proposes that even in languages like English and Japanese, the semantics of comparison is not a matter of either/or, where *either* degree morphology *or* standard markers are of importance: standard markers are responsible to a greater extent for the semantics of comparison, even where degree morphology is present. Navajo degree morphology fills one of the roles posited for degree morphology under Kennedy's analysis.

3.2: Parameterizing the degree morphology vs. standard marker choice?

In Section 1, Japanese and English were introduced as languages that the relational analysis could account for in a straightforward manner. Comparative constructions in each language are given in (51a,b).

- (51) a. TOPIC OF GRADABLE DEGREE STANDARD STANDARD OF
 COMPARISON PREDICATE MORPHEME MARKER COMPARISON
 Sally (is) tall -er than Anna.
 ‘Sally is taller than Anna.’
- b. TOPIC OF STANDARD OF STANDARD DEGREE GRADABLE
 COMPARISON COMPARISON MARKER MORPHEME PREDICATE
satowa kawa yori ø chikashi
 village river from near
 ‘The village is nearer than the river.’

(Klein 1991: 676; cited from Stassen 1985)

The English and Japanese data can be summarized as shown in TABLE H.

Table H: Typology of gradable predicates and degree constructions

<i>Language</i>	<i>Degree Morphology</i>		<i>Standard Marker</i>	
	Differentiated?	Contributes to the semantics?	Differentiated?	Contributes to the semantics?
English	Yes	Yes	No	No
Japanese	No	No	Yes	Yes

The relation between degree morphology and standard markers seems to be one of ‘either/or’: *either* degree morphology *or* standard markers alternate in form based on the degree construction. Likewise, *either* degree morphology *or* standard markers make a contribution to the semantics by introducing the ordering relation. A relevant generalization (which will have importance in later discussion) is that if the standard marker is differentiated between different degree constructions, it determines the semantics of comparison. Likewise, if degree morphology is differentiated between degree constructions, it determines the semantics of comparison.

Cross-linguistically, standard markers are used more frequently than degree morphology to introduce ordering relations. As noted in Section 1, in his survey of modes of comparison, Stassen found that out of 110 languages, only 38 marked comparative degree with either bound or analytic morphology (Stassen 1985, cited in Bobaljik 2007: Appendix I). We will keep in mind the cross-linguistic preference for standard markers over degree morphology.

Momentarily laying aside the apparent cross-linguistic preference for standard markers over degree morphology, TABLE H – and its implementation in the following parameter – appears to handle the typological possibilities.

(52) *The Degree Morphology/Standard Marker Parameter*

The language differentiates between and uses {degree morphology / standard markers} to express the semantics of comparison.

3.3: Optional degree morphology

If the parameter in (52) is a satisfactory account, we predict that depending on which morpheme is semantically operative (degree morpheme vs. standard marker), then deletion of the operative morpheme should result in ungrammaticality.

In fact, this does not appear to be the case. In Modern Hebrew, *more than* and *less than* comparative constructions involve alternation between *yoter* ‘more’ and *paHot* ‘less’. When the standard of comparison is phrasal, as in (53), the standard marker *mi-* ‘from’ is used (Glinert 1989: 217). However, as shown in (53a), when a dimensional predicate is used, *yoter* can be deleted. Deletion of *yoter* is not possible in (53b) where an evaluative (following Bierwisch 1989) predicate is used. The standard marker *mi-* must remain regardless of the presence or absence of the degree morpheme.³²

³² Schwarzschild (2005) accounts for the comparative meaning in (47a) through a type-shifting relation that

(53) a. (*yoter*) *gadol mi-meni*
more big than-1sg
'bigger than me'

b. *(*yoter*) *xole mi-meni*
more sick than-1sg
'sicker than me'

(Schwarzschild 2005: exx. 45-46)

A degree morpheme is not used at all in the equative construction, where the standard marker *kmo* 'like' is used to introduce the ordering relation.

(54) *Hu gavóa kamoH*
3sg tall like-2sg
'He's as tall as you.'

(Glinert 1998: 218)

Examples such as (53a) and (54) suggest the following questions: What does the degree morpheme contribute to the semantics of the degree construction? What is the role of the standard marker in the semantics of comparative and equative constructions? It may be noted that the standard marker, unlike the degree morpheme, is consistently present in all degree constructions. From this very cursory look at Hebrew, standard markers appear to play a non-trivial role in the semantics: even though degree morphology (e.g., *yoter*) is used in certain constructions, it is optional based on environment and absent entirely in other degree constructions.

3.4: Phrasal vs. clausal distinction

The parameter proposed in (52) also entails that the standard marker or degree morphology will alternate in form just in case the standard marker or degree morpheme determines the ordering relation. However, alternation in the standard marker is also observed

imposes a greater-than relation, and still views the standard marker as not contributing to the semantics of comparison. However, given that the standard marker *mi-* translates as 'from,' just like *yori* in Japanese, it does not seem implausible that the standard marker is actually introducing the semantics of the comparative relation, making a type-shifting relation unnecessary.

even when the standard marker is not credited with introduction of the ordering relation: cross-linguistically, standard markers also alternate based on the semantic type (phrasal vs. clausal) of the standard of comparison.

As shown in (55a,b), standards of comparison in English may be either phrasal or clausal. Following standard views, I give the comparative clause in (55b) as a *wh*-construction in which a null operator *Op* has moved from DegP to SpecCP (Chomsky 1977, Kennedy 1997).

(55) a. Sally is taller than [DP Anna].

b. Sally is taller than [CP *Op*_x Anna is [DEGP ~~*t*_x~~ *tall*]]. (adapt. Kennedy 1997: 149)

The question of whether phrasal standards of comparison are generated directly as DP (the Direct Analysis) or whether they are derived from clausal sources through further ellipsis (the Reduction Analysis) has been discussed extensively in the literature (Hankamer 1973; Heim 1985, 2000; Kennedy 1997; Lechner 2001; Bhatt & Takahashi 2007; *inter alia*). Support for the Direct Analysis comes from languages in which only phrasal standards of comparison are available, c.f. Bhatt & Takahashi (2007) for Hindi-Urdu, Xiang (2003) for Mandarin, and Kennedy (in press) for Japanese.

I do not wish to address the benefits or challenges associated with adoption of the Direct or Reduction Analysis. Rather, I note that all of the above analyses have assumed that when both phrasal and clausal standards are available, degree morphemes – and not the standard marker – select the type of the standard. As shown in the interpretations below, when *more* selects for a clausal standard of comparison, it selects for a degree-denoting standard (type <d>). When *more* selects for a phrasal standard of comparison, it selects for an individual-denoting standard (type <e>) (Bhatt & Takahashi 2007; Kennedy in press, 2007a).

(56) a. $\|more_D\| = \lambda d \lambda g_{\langle d, et \rangle} \lambda x. \max(g)(x) > d$

b. $\|more_I\| = \lambda y \lambda g_{\langle d, et \rangle} \lambda x. \max(g)(x) > \max(g)(y)$ (Kennedy 2007a: 6)

Proposing two semantic interpretations for the degree morpheme *more* suggests that some language will make a distinction between the two forms. Such a distinction has not been found in the degree morphology of any language. However, the distinction between phrasal and clausal standards of comparison is reflected in standard markers in certain languages. For instance, in Greek, phrasal standards of comparison are marked with *apo* while clausal standards are introduced by *apoti*. In Russian, phrasal standards are obligatorily marked in the genitive case (and no standard marker is used) while clausal standards are introduced by *čem*. To the following chart, I have added Modern Hebrew, which shows alternation between the phrasal standard marker *mi-* and the clausal standard marker *measher* (Glinert 1989: 216-17).

Table I: Alternation of standard markers in Greek, Russian, and Hebrew

Standard marker	Greek	Russian	Modern Hebrew
Phrasal (individual)	<i>apo</i>	genitive case	<i>mi-</i>
Clausal (degree)	<i>apoti</i>	<i>čem</i>	<i>measher</i>

(adapt. Kennedy 2007a: 7)

Based on this observation, Kennedy (2007a) argues convincingly that the standard marker should be credited with introducing the phrasal vs. clausal distinction. By crediting the standard marker with selecting for the semantic type of the standard, we remove the need to posit degree morphology with the same shape (e.g., *more* vs. *more*) but different semantics (*more_D* vs. *more_I*). Furthermore, this account provides a possible explanation of why, cross-linguistically, standard markers alternate based on the type of the standard of comparison: each form of the standard marker has a distinct semantic interpretation.

Notably, Greek and Russian both use degree morphology to introduce the ordering relation (Bobaljik 2007: 53).³³ Thus, when degree morphology alternates, the ordering relation

³³ The role of comparative morphology in Hebrew is addressed in §3.3.

alternates with it. But when the standard marker alternates, the semantic type of the standard of comparison alternates. Thus, the parameter proposed in (52) – which predicts that only the morpheme that alternates will be involved in the semantics of the degree construction – again proves too simplistic to account for all factors in play in cross-linguistic degree constructions.

3.5: Kennedy’s proposal and ‘meaningless *more*’

Given the insufficiency of the parameter proposed in (52), we have several options for how to proceed. First, we could claim that in languages in which degree morphology and standard markers both alternate, the degree morphemes alternate based on the ordering relation while the standard marker alternates based on the type of the standard. However, this account is not particularly satisfying and would require us to break up the interpretations in (56).

A more elegant option would be to shift the responsibility for determining the semantics of comparison over to the standard marker. We have seen three primary pieces of evidence in favor of assigning a greater role in the semantics of comparison to the standard marker, both within individual languages and cross-linguistically. First, the standard marker is already serving in one capacity in determining the semantics of comparison (selecting for a phrasal vs. clausal standard of comparison) cross-linguistically. Second, degree morphology is not always necessary in comparative constructions (c.f. Hebrew). Finally, as noted above, degree morphology is cross-linguistically far more rare than standard markers. The drawbacks of proposing degree morphology for these languages were discussed for Japanese in Section 1: it forces us to postulate a full set of null degree morphology while ignoring a standard marker with directional meaning (*yori* ‘from’) that a priori seems well-suited for introduction of the ordering relation (c.f. §1.4; Sawada, to appear).

Drawing on these three observations and seeking maximal cross-linguistic applicability, Kennedy (2007a) sketches an alternate view on the semantics of degree morphology and standard markers. Under this view, the standard marker is responsible for introducing “the semantics of comparison” (Kennedy 2007a: 7): this includes selecting the type of the standard and introducing the ordering relation. For instance, the Greek standard markers *apo* and *apoti* could have the semantics in (57) given that the language permits both phrasal and clausal standards of comparison. Japanese *yori*, on the other hand, would have the interpretation in (57b) since only phrasal standards are permitted (Kennedy, in press; Sawada, to appear).

- (57) a. $\|apoti_D\| = \lambda d \lambda g_{\langle d, et \rangle} \lambda x. \max(g)(x) > d$
 b. $\|apo_I\| = \lambda y \lambda g_{\langle d, et \rangle} \lambda x. \max(g)(x) > \max(g)(y)$ (Kennedy 2007a: 7)

Accordingly, the semantic role played by degree morphology is greatly reduced. Kennedy posits that composition of a gradable predicate with a degree morpheme like *more* converts the gradable predicate “into something that can select for a standard constituent” (2007a: 6). Assuming that *tall* is of type $\langle d, et \rangle$ as under the relational analysis, composition of *tall* and *more* enables *tall* to select for a standard of comparison.

(58)

<i>tall</i> CAT Gradable Predicate SEL \emptyset TYPE $\langle d, et \rangle$ SEM $\lambda d \lambda x. \delta_{tall}(x) \geq d$	[MORE <i>tall</i>] CAT Gradable Predicate SEL Standard TYPE $\langle d, et \rangle$ SEM $\lambda d \lambda x. \delta_{tall}(x) \geq d$
--	---

(adapt. Kennedy 2007a: 7)

However, as Kennedy notes, this renders degree morphology semantically ‘meaningless’ since *tall* and [MORE *tall*] have identical interpretations (given as SEM). Perhaps this is tenable for languages that lack degree morphology entirely, but given the significant number of languages that do require degree morphology, it seems preferable to assign some task to degree morphology, if possible.

Doing so requires us to rethink the semantic type of the gradable predicate, once again calling the relational analysis into question. The semantic ‘meaningless-ness’ of *more* in (58) stems from the assumption of the relational analysis that *tall* is fundamentally of type $\langle d,et \rangle$. Kennedy suggests that rather than positing type $\langle d,et \rangle$ for gradable predicates in their most basic form, we could propose that gradable predicates are instead fundamentally of type $\langle ed \rangle$ as under the decompositional analysis (2007a: 8). Recalling discussion in §2.6.2, degree morphology in the decompositional analysis not only introduces the ordering relation but also converts the measure function into a property of individuals (Kennedy 1997). Generalizing away from the ordering relations introduced by specific morphemes, we may say that the degree morpheme *pos* converts the measure function into a context-sensitive property of individuals (type $\langle et \rangle$) while all other degree morphemes (*more/er, less, as*) convert the measure function into a function from degrees to properties of individuals (type $\langle d,et \rangle$). Degree morphology under the relational analysis was only responsible for introducing the ordering relation: since the standard marker now performs this function, degree morphology is left vacuous. However, if the decompositional analysis is assumed, degree morphology can still be charged with conversion of the measure function into a property of individuals, either $\langle et \rangle$ or $\langle d,et \rangle$ (Kennedy 2007a: 8).

Adoption of this view of gradable predicates and degree constructions offers several benefits. In particular, it provides a solution to the difficulties of deciding how to divide up semantic tasks between degree morphology vs. standard markers. For instance, the analysis could solve a question lingering from the discussion of Hebrew data. Assuming a relational analysis ($\langle d,et \rangle$) semantics for the gradable predicates *xole* ‘sick’ and *gadol* ‘big’, if we were to claim that in (53a) and (54), the standard marker is introducing the ordering relation rather than the degree morpheme, we would be forced to propose that the degree morpheme and standard

marker are redundant in (53b). However, the new analysis allows us to propose that the standard markers are introducing the ordering relation while the degree morphology is *doing something else*. The nature of this ‘something else’ is still undetermined in Hebrew, but at least the new analysis allows for the possibility that degree morphology and standard markers may play different roles in the semantics of comparison.

However, there is a potential difficulty. When we abstract away from the ordering relation introduced by particular degree morphemes, we are only assuming one half of the decompositional analysis. If this is the right analysis to pursue, we predict that we will find a language in which degree morphology can be realistically analyzed as *only* converting the gradable predicate into a property of individuals and not also introducing an ordering relation. An ideal language would have underspecified degree morphology and unambiguously use the standard marker to introduce the ordering relation.

3.6: Integrating Navajo into the analysis

In Section 2, I demonstrated that the relational analysis does not adequately account for the Navajo. There were two reasons for its inapplicability to Navajo: (i) gradable predicates are not fundamentally of type $\langle d, et \rangle$, and (ii) while standard markers are responsible for introducing the ordering relation, degree morphemes (*ni*-⁶ and (*’á*)-*ni*-²) compose with the stem to determine the type of the gradable predicate ($\langle et \rangle$ or $\langle d, et \rangle$, respectively). However, whereas the relational analysis falls short, the facts from gradable predicates and degree constructions in Navajo are exactly what we expect under Kennedy’s (2007a) analysis. First, in Navajo standard markers clearly introduce the ordering relation, while degree morphology is semantically underspecified, determining only the type of the predicate: this is the precisely the combination of features in a language that would best support (and be best supported by) the analysis discussed above.

The function of Navajo degree morphology (and its effect on the semantics of the gradable predicate) can be summarized as in (59). Beyond the conversion of the type $\langle \text{ed} \rangle$ measure function into a type $\langle \text{et} \rangle$ or $\langle \text{d,et} \rangle$ expression, all other parts of the degree construction (i.e., selection of a phrasal vs. clausal standard and introduction of the ordering relation) are determined by the degree expression (i.e., standard marker).

(59)

[<i>tall</i>] CAT Gradable Predicate SEL \emptyset TYPE $\langle \text{ed} \rangle$ SEM $\lambda x. \delta_{\text{tall}}(x)$	[<i>ni⁻⁶ tall</i>] CAT Gradable Predicate SEL STND(s) TYPE $\langle \text{et} \rangle$ SEM $\lambda x. \delta_{\text{tall}}(x) > \text{STND}(s)$	[<i>(‘á)-ni⁻² tall</i>] CAT Gradable Predicate SEL St TYPE $\langle \text{d,et} \rangle$ SEM $\lambda d \lambda x. \delta_{\text{tall}}(x) \geq d$
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Viewed in the context of the present analysis, the Navajo data no longer appear problematic or unexpected: rather, they reflect (in a particularly well-defined manner) a set of cross-linguistic tendencies and patterns.

3.7: Summary

In Section 3, we found insufficient a single parameter that assigns semantic agency to *either* degree morphology *or* the standard marker, a choice made on the basis of which morpheme (standard marker vs. degree morphology) alternates its shape in degree constructions. Furthermore, three pieces of evidence were presented in favor of assigning the standard marker heightened importance in the semantics of comparison. First, we noted that cross-linguistically, standard markers are used far more often than degree morphology. Second, even in languages that always use degree morphology (Greek, Russian), the standard marker still plays an important role in the semantics of comparison through selection of a phrasal vs. clausal standard of comparison. Third, in other languages (Modern Hebrew), degree morphology is only

necessary in certain degree constructions and with certain predicates, while standard markers are always necessary.

Kennedy (2007a) responded to such evidence by proposing an alternate analysis that attributes the semantics of comparison (including introduction of the ordering relation) to standard markers. The core challenge posed to this analysis – the fact that *more* and other degree morphemes are left meaningless – can be overcome if predicates are posited to be measure functions which, as under the decompositional analysis, are converted into type $\langle et \rangle$ or $\langle d, et \rangle$ predicates through the addition of degree morphology. The analysis of degree constructions and gradable predicates developed for Navajo in Section 2 provides strong empirical support for the analysis. In addition, by considering the analysis developed for Navajo in the wider cross-linguistic context of Section 3, the Navajo data can be seen not as typological exceptions but rather reflections of cross-linguistic patterns that were also inadequately accounted for by the relational analysis.

4: Syntax and semantics of Navajo degree constructions

4.1: Introduction

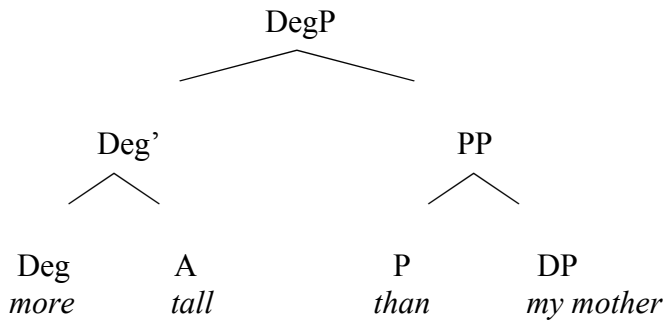
In Section 4, I present a syntactic and semantic analysis of two full Navajo degree constructions. In doing so, I implement the analysis developed at the end of Section 3, in which standard markers introduce the ordering relation while degree morphology determines the semantic type of the predicate (either $\langle d, et \rangle$ or $\langle et \rangle$). After briefly introducing the syntactic framework that I will assume for the remainder of the analysis, I move directly into discussion of comparatives constructions that utilize (*á*)-*ni*⁻²-marked (type $\langle d, et \rangle$) gradable predicates. I show that Function Application is the only semantic operation needed to account for these constructions. I then move on to a discussion of degree constructions with *ni*⁻⁶-marked (type

<et>) predicates. These constructions present a greater challenge since *ni*-⁶-marked predicates lack the argument position necessary for Function Application to take place. Rather, I present an approach utilizing Predicate Modification that accounts for the preservation of evaluativity that is part of the meaning of degree expressions with *ni*-⁶-marked predicates, as discussed in §2.7.

4.2: The Extended Projection account

In the syntactic and semantic analyses of degree constructions to follow, I assume the Extended Projection account of gradable predicates, exemplified in (60). Under this analysis, the gradable predicate projects extended functional structure, the DegP projection. The degree morpheme Deg (*more/er*) forms a single syntactic constituent with the gradable predicate A (*large*). The degree expression (here, *than Rome*) is located in specifier position of DegP.

(60) *I am taller than my mother.* (adapt. Kennedy 2007b)



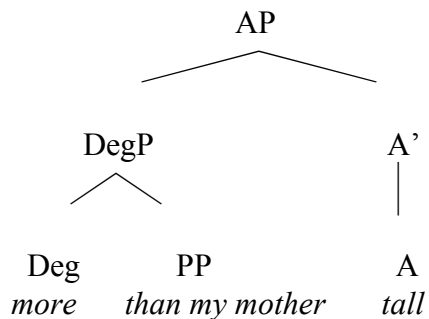
This analysis is strongly supported cross-linguistically (Abney 1987; Kennedy 1997, 2007b; Grosu & Horvath 2006; Rett 2008; *inter alia*). Furthermore, the Extended Projection account is particularly well suited to the analysis developed in Section 3. Recall that the function of degree morphology under this account is to convert the gradable predicate from a measure function into a property of individuals (an expression of type <d,et> or <et>). Degree morphology must compose with the gradable predicate before it can proceed through the derivation: a syntactic analysis that reflects the tight relation between degree morphology and the gradable

predicate seems intuitively right for the semantic analysis. Furthermore, under this analysis, since degree morphemes are syntactic heads, they can impose restrictions on their arguments (Kennedy 1997; Neeleman et al. 2004). This could explain why only certain sorts of expressions are allowed in the specifier position of DegP, namely degree-denoting degree expressions.

The Extended Projection account is also favored for reasons specific to Navajo. First, degree morphemes *ni*-⁶ and (*á*)-*ni*-² are always morphologically bound to the verb stem. In the case of (*á*)-*ni*-², the morphological relation between degree morpheme and verb stem is so tight that the presence of (*á*)-*ni*-² causes stem vowels to raise (c.f. TABLE D). However, the degree expression still forms a constituent (DegP) with the gradable predicate, providing an account for the restrictions on the placement of the degree expression discussed in §2.7.

For completeness, we may briefly note why the classical account of the syntax of gradable predicates and degree constructions is not favorable for the Navajo data. Under this account, illustrated in (61), the degree morpheme and the standard of comparison form a single DegP constituent, which takes the gradable predicate as a complement (Bresnan 1973). For discussion of the choice between the Extended Projection account and the classical account, see Bhatt & Pancheva (2004) and Grosu & Horvath (2006).

(61) *I am taller than my mother.*



Assuming the analysis put forth in Section 3, if we posit a syntactic structure as in (61), the degree morphemes (*'á*)-*ni*⁻² would be split from the verb stem and placed in a closer syntactic relation with the degree expression: while the degree expression in Navajo *is* is in a tight syntactic relation with the predicate (c.f. §2.7), it would be difficult to argue that the degree expression is in a closer relation with (*'á*)-*ni*⁻² than the syntactic relation between (*'á*)-*ni*⁻² and the verb stem.

Before proceeding with the analysis, a final point of syntax unrelated to the Extended Projection analysis deserves brief mention. It has often been noted that the set of all Navajo predicate stems does not fit into a single category (e.g., nominal vs. verbal), although categories can be determined on a stem-by-stem basis (c.f., Hale 2000).³⁴ The indeterminacy of stem type leads Hale to propose that stems are Roots [R]: a morpheme “[R] belongs to the class of elements which require a specifier, this requirement being satisfied by the host verb; (ii) the verb which selects and hosts [R] has the dual properties that it takes a complement ([R] itself) and projects a specifier” (Hale 2000: 88). The verbal head itself is unpronounced, in Hale’s account. The root R and V conflate to form a maximal verbal projection. Under Hale’s account, mode and aspect morphology attaches above the verbal projection.

In my own analysis of the degree constructions, I will give stems as [*√*] (roots) and the verbal specifier as [*v*]. Although I intend for these labels to evoke the Distributed Morphology framework (Halle & Marantz 1993; Marantz 1997), the analysis presented here does not hinge on the use of these labels: [*√*] and [*v*] could be just as easily referred to as [R] and [V], respectively, following Hale (2000).

³⁴ In TABLE D, several stems were noted to be nominal: for example, the noun *ch'íí'dii* ‘evil spirit, ghost’ is the stem of *ni*⁻²-marked predicate *ní'ch'íí'dii* ‘mean, nasty.’

4.3: Degree constructions with ('á)-ní²-marked predicates

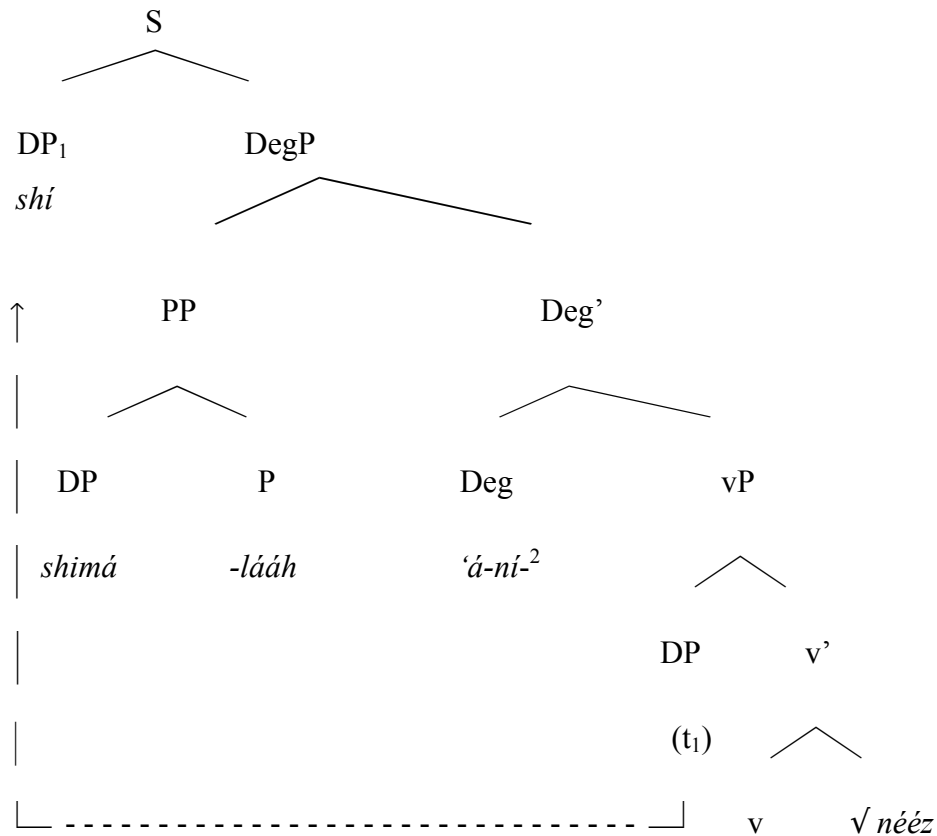
In this section, I provide an account of degree constructions with ('á)-ní²-marked predicates. The primary objective is to implement the analysis outlined in Section 3 where degree morphology determines the semantic type of the predicate and the standard marker introduces the ordering relation.

4.3.1: The comparative construction

In the comparative construction, I adopt the semantic interpretation of comparative postposition *-lááh* given in (62b) below. The interpretation of *-lááh* is identical to that proposed by Sawada (to appear) for Japanese *yori* (see also Kennedy 2007a). The entries in (62d,e) show the end result after composition is complete: (62d) shows the full interpretation of both instances of the gradable predicate. The syntactic and semantic derivation is given in TREE K. A detailed account of the derivation follows. In the following interpretations, *s* is a verb stem of a gradable predicate, a measure function of type $\langle \text{ed} \rangle$ (given as δ_{tall} in the derivations); *g* is a gradable predicate of type $\langle \text{d}, \text{et} \rangle$ (given as *d-tall* in the derivations); *z* is an individual of type $\langle \text{e} \rangle$; and *d* is a degree of type $\langle \text{d} \rangle$.

- (62) a. (*Shi*) *shimá bilááh 'ánisnééz*
1sg. 1sg-mother 3sgO-BEYOND 'á-ní²-1sgS-tall
'I am taller than my mother.'
b. $\| -lááh \| = [\lambda y \lambda g \lambda x. \max(g)(x) > \max(g)(y)]$
c. $\| 'áni_nééz \| = \lambda d \lambda z. \delta_{\text{tall}}(z) \geq d$
d. $\max(\lambda d'. \delta_{\text{tall}}(\text{I}) \geq d') > \max(\lambda d''. \delta_{\text{tall}}(\text{my mother}) \geq d'')$
e. $\max(\text{tall})(\text{I}) > \max(\text{tall})(\text{my mother})$

Tree K: *Shí shimá bilááh ‘ánísnééz*



(A) Derivation of *Deg'*

$$\|_{\text{Deg}}('á)\text{-ní-}^2\| = \lambda s \lambda d \lambda z. s(z) \geq d$$

Composition with *-nééz* 'tall':

$$\text{Deg}' = [\lambda s \lambda d \lambda z. s(z) \geq d](\delta_{\text{tall}})$$

$$\text{Deg}' = \lambda d \lambda z. \delta_{\text{tall}}(z) \geq d$$

Deg' is realized as *'ání_nééz*.³⁵ The nature of the '___' (the space in which subject inflection will ultimately surface) is considered in discussion below. The semantic type of *'ání_nééz* is $\langle d, \text{et} \rangle$. Thus, *('á)-ní-²* has converted the gradable predicate from a measure function (type $\langle \text{ed} \rangle$) into a function from degrees to properties of individuals (type $\langle d, \text{et} \rangle$). This makes the

³⁵ Note that the verb stem $[\sqrt{\quad}]$ is given as *-nééz* rather than *-neez*. The raised-vowel form of the stem is only found in the comparative aspect. I suspect that the verb stem is underlyingly *-neez* and that stem vowels raise only after composition with *ní-²*. High tone assimilation is a relatively common phonological process in Navajo. However, I leave the details of this question to future research.

type of (*á*)-*ni*-² $\langle\langle\text{ed}\rangle\langle\text{d,et}\rangle\rangle$. As discussed in Section 3, the sole function of degree morphology is the conversion of a measure function into a property of individuals: all other semantic relations necessary in a given degree construction are introduced in the degree expression, which corresponds to the PP node in TREE K.

(B) *Derivation of PP*

$$\|-\text{lááh}\| = \lambda y_{\langle e \rangle} \lambda g_{\langle \text{d,et} \rangle} \lambda x_{\langle e \rangle} . \text{max}(g)(x) > \text{max}(g)(y)$$

Composition with *shimá* ‘my mother’:

$$\text{PP} = [\lambda y \lambda g \lambda x . \text{max}(g)(x) > \text{max}(g)(y)](\textit{shimá})$$

$$\text{PP} = [\lambda g \lambda x . \text{max}(g)(x) > \text{max}(g)(\text{my mother})]$$

The comparative postposition *-lááh* composes with *y*, the standard of comparison (type $\langle e \rangle$). Composition with the standard of comparison (here, *shimá*) triggers inflection on the postposition. The degree expression [*shimá bilááh*] is indicated as PP in TREE K. Given that PP composes with a type $\langle \text{d,et} \rangle$ gradable predicate, and produces a type $\langle \text{et} \rangle$ property of individuals, we can identify the PP as a type $\langle\langle \text{d,et} \rangle\langle \text{et} \rangle\rangle$ expression. The selection of a type $\langle \text{d,et} \rangle$ argument by PP will become crucial to our discussion of the semantics of *ni*-⁶-marked degree constructions and the function of ‘*át*’*é* in §4.4.

(C) *Derivation of DegP*

Composition of [*shimá bilááh*] with ‘*ání_nééz*’, the gradable predicate *g*:

$$\text{DegP} = [\lambda g \lambda x . \text{max}(g)(x) > \text{max}(g)(\text{my mother})](\textit{ání_nééz})$$

$$\text{DegP} = [\lambda x . \text{max}(\lambda d' . \delta_{\text{tall}}(x) \geq d') > \text{max}(\lambda d'' . \delta_{\text{tall}}(\text{my mother}) \geq d'')]$$

The degree expression (the PP *shimá bilááh* ‘beyond my mother’) then composes with *g*, a gradable predicate of type $\langle \text{d,et} \rangle$, which is here Deg’ ‘*ání_nééz*’. According to the interpretation of *-lááh*, *-lááh* (like *more/er* under the relational analysis) compares the degree arguments of two instances of the gradable predicate *g*, one applied to the topic of comparison (*x*) and one applied to the standard of comparison (*y*, or *shimá*). In the interpretation of DegP, *d'* and *d''*

refer to the degrees of tallness of x (the topic of comparison) and *my mother* (the standard of comparison), respectively.

Once PP and Deg' have formed DegP, DegP is a property of individuals (type $\langle et \rangle$). Recall from discussion of the relational analysis in Section 1 that degree morphology saturated a gradable predicate's degree argument d by semantically restricting its value by comparing it to a second degree. Under the new analysis, this is the function of the degree expression (e.g., *shimá bilááh*). In the derivation of DegP, once d' and d'' are assigned values relative to each other, these are no longer available in the derivation, leaving DegP as a type $\langle et \rangle$ expression.

(D) Derivation of S

Composition with *shí* 'I':

$$S = [\lambda x. \max(\lambda d'. \delta_{\text{tall}}(x) \geq d') > \max(\lambda d''. \delta_{\text{tall}}(\text{my mother}) \geq d'')](shí)$$

$$S = [\max(\lambda d'. \delta_{\text{tall}}(I) \geq d') > \max(\lambda d''. \delta_{\text{tall}}(\text{my mother}) \geq d'')]$$

Or, with the interpretations of *d-tall* simplified:

$$S = \max(d\text{-tall})(I) > \max(d\text{-tall})(\text{my mother})$$

Finally, DegP composes with individual x , the topic of comparison (*shí*), to yield a proposition $\langle t \rangle$. Composition with x triggers subject inflection (*s-*) on the verb.

Having fleshed out the semantics proposed for the comparative construction in Navajo, I posit that the semantics of degree constructions utilizing other degree expressions (especially, *P-oh* 'short of P', *P-ee* 'with P', and *DP-gi* 'at DP') can be modeled on the semantics presented here.

4.3.2: Accounting for subject inflection

For the most part, the derivation of the Navajo comparative construction is straightforward and familiar. The only instance in which semantic composition does not match the surface order of morphemes is the composition of the type $\langle et \rangle$ predicate with the topic of

comparison. In the actual verb word *‘ánísnééz* ‘I am tall in a relative or comparative sense,’ subject inflection (*s-*) occurs between the stem (*nééz*) and the degree morphemes (*‘á*)-*ni*⁻². Since composition with the topic of comparison is delayed until such a late stage in the derivation, ‘__’ marks the position in the verb word where subject inflection will ultimately be found.

I have accounted for this apparent disconnect between order of morphemic and semantic composition in the following way. In TREE K, I have indicated that *shí*, the independent 1st person subject morpheme, raises out of vP and leaves behind a trace. This view of the syntax is consistent with Hale’s (2000) syntactic analysis. Ultimately, it may be more satisfactory to argue that the subject inflection is not a trace at all, but rather a copy or a resumptive pronoun that is partially pronounced at all stages of the interpretation but which does not undergo full spell-out as *shí* until it composes semantically in the final stage of the derivation, or (to put it differently) is not available to the semantics until this late stage. This is a question that merits more research.

4.4: Degree constructions with *ni*⁻⁶-marked predicates

Recall that the majority of Navajo predicates can only be marked with *ni*⁻⁶, the degree morpheme that was shown to have the semantic interpretation of the *pos* morpheme. The only degree constructions in which *ni*⁻⁶-marked predicates cannot be used are measure phrase and comparative subdeletion constructions (c.f. §2.7.2) and *P-ee* equatives (c.f. §2.3). The unavailability of measure phrase and comparative subdeletion constructions was attributed in §2.7 to the absence of an open degree argument on *ni*⁻⁶-marked predicates. A similar explanation will be posited for the unavailability of *P-ee* equatives. However, even when *ni*⁻⁶-marked predicates can be used in degree constructions, the result is syntactically and semantically distinct from their counterparts with (*‘á*)-*ni*⁻²-marked predicates. Specific issues to be addressed in this section include: (i) the syntax of degree expressions marked by the

subordinated copula *‘át’éego*, (ii) the semantic contribution of *‘át’é*, and (iii) preserving the implicitly evaluative interpretation of degree constructions utilizing *ni*⁻⁶-marked predicates.

4.4.1: The syntactic function of *‘át’éego*

In Section 2, I discussed the obligatory presence of the subordinated copula *‘át’éego* in degree constructions utilizing *ni*⁻⁶-marked predicates. As evidenced by sentences in which the degree expression has been topicalized, *‘át’éego* functions as a single constituent with the degree expression, marked by setting off the (standard of comparison + standard marker) in square brackets in (63).

- (63) a. *K’ad chidí naat’aí [hosiyoalts’ŋt yilááh ‘át’éego] nidat’a’*
 now airplane speed.of.sound 3’sgO-BEYOND 3sgS-be-SUB *ni*⁻⁶-3sgS-fast
 ‘Now airplanes are faster than the speed of sound.’
- b. [*Hosiyoalts’ŋt yilááh ‘át’éego*] *k’ad chidí naat’aí nidat’a’*
 speed.of.sound 3’sgO-BEYOND 3sgS-be-SUB now airplane *ni*⁻⁶-3sgS-fast
 ‘Now airplanes are faster than the speed of sound.’
- c. *K’ad chidí naat’aí nidat’a’*
 now airplane *ni*⁻⁶-3sgS-fast
 ‘Now airplanes are faster than the speed of sound.’ (Ellavina Perkins, p.c.)

As discussed in §2.2, the subordinator *–go* is canonically used to mark (clausal or non-clausal) material as adverbial (Schauber 1979). The syntactic behavior characterizing *go*-marked degree expressions that modify *ni*⁻⁶-marked predicates (c.f. (63)) strongly suggests that these degree expressions are indeed adverbial. The possibility of movement in (63) contrasts with degree expressions co-occurring with (*‘á*)-*ni*⁻²-marked predicates, which may not be topicalized (c.f. §2.7). Furthermore, *go*-marked material may be deleted when it modifies action-denoting and *ni*⁻⁶-marked predicates: as demonstrated in Section 2, *ni*⁻⁶-marked predicates, like action-denoting predicates, are fully saturated.

Taken together, we appear to have two syntactic options available to us depending on the presence vs. absence of an open degree argument in Deg' (the verb stem marked with degree morphology). If the predicate has a degree argument (Deg is ('á)-ní⁻²), the degree expression (labeled as PP) is found in specifier position of DegP. If the predicate lacks a degree argument (Deg is ní⁻⁶), the degree expression is an adjunct to DegP, adjoining higher in the derivation.

There is a precedent in the literature for proposing distinct syntactic structures for degree constructions based on the presence or absence of a degree argument. Doetjes (2008) proposes that degree morphology may be divided into several categories, including TYPE A and TYPE C morphemes.³⁶ Type A degree morphemes select for predicates with degree arguments (i.e., gradable predicates). The degree morpheme is a functional head (as under the Extended Projection account) and composes with the gradable predicate to form a DegP projection. Type A morphemes include *more/er*, *less*, and *as*. Many of the same morphemes can function as both Type A and Type C morphemes (including *more*, *less*, and *as*). The two categories may be distinguished based on the types of predicates that they select for – Type C morphemes modify predicates without degree arguments, e.g., mass and plural nouns, action-denoting verbs – and the resultant syntactic structures – Type C morphemes modify predicates as adjuncts and form their own extended projections (Doetjes 2008: 126-128). The syntax proposed by Doetjes (2008) for degree constructions utilizing Type A and Type C morphemes is given in TREE L.

³⁶ Two caveats: First, Doetjes (2008) assumes the relational analysis such that all (and only) gradable adjectival predicates have open degree arguments (and degree morphology introduces the ordering relation. Furthermore, both Doetjes (2008) and Neeleman et al. (2004) refer to degree morphology (e.g., *more*, *less*, *as*) as 'degree expressions' (thus, Doetjes actually draws the distinction between *Type A expressions* and *Type C expressions*. Here, I have opted to refer to these categories as 'morphemes' in order to not create confusion between the morphemes referenced by Doetjes (2008) and the class of degree expressions that I propose for Navajo (*P-lááh*, *DP-gi*, measure phrases, *ayóo*, etc.), c.f. TABLE B.

Tree L: Syntax of degree construction with TYPE A and TYPE C degree expressions

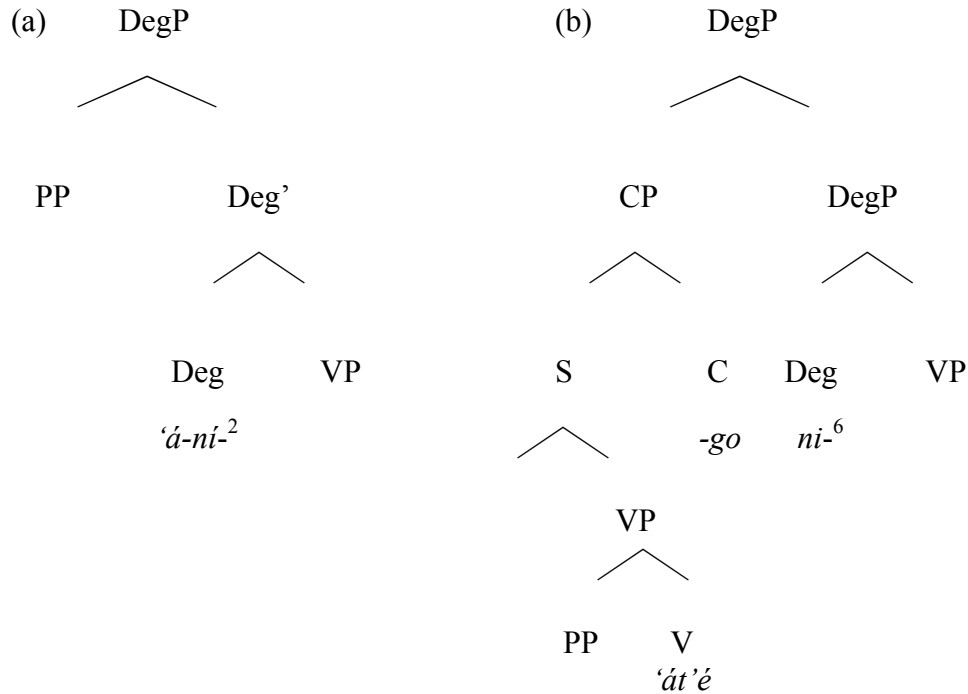


I propose that the above syntactic structures can inform our treatment of the syntax of Navajo degree constructions. I propose that non-subordinated degree expressions that modify (e.g., *P-lááh* ‘beyond P’) correspond to Doetjes’ Type A morphemes, while subordinated degree expressions modifying *ni*⁶-marked predicates (e.g., *P-lááh ‘át’éego*) correspond to Doetjes’ Type C morphemes. Like Type A morphemes, *P-lááh* only modifies gradable predicates with degree arguments ((*á*)-*ni*²-marked predicates). Like Type C morphemes, [*P-lááh ‘át’éego*] modifies predicates without degree arguments (*ni*⁶-marked predicates and action-denoting predicates).

Given that I assume the view of gradable predicates and degree constructions developed in Section 3, my proposal necessarily departs from Doetjes’ analysis, which assumes the relational analysis and credits degree morphology (rather than standard markers) with introduction of the ordering relation. In particular, where Doetjes draws a distinction between degree morphemes in head vs. adjunct position, I distinguish between degree expressions in specifier vs. adjunct position. However, my analysis preserves the core distinction made by Doetjes. Type A expressions are found under the same extended DegP projection as the gradable predicate, c.f. TREE M (a). By contrast, Type C expressions adjoin as adjuncts and form their own

extended projection (a DegP in Doetjes' account and a CP in mine), c.f. TREE M (b). In both trees, the degree expression is abbreviated as PP.

Tree M: Syntax of degree constructions with ('á)-ní⁻² and ní⁻⁶-marked predicates



4.4.2: The semantic role of 'át'é

Having seen what role 'át'égo may be playing in the syntax, we may now turn to the role of the subordinated copula in the semantic derivation. Drawing again from Doetjes (2008), I will argue in favor of an analysis of 'át'é in which it, like *much* or *many*, is a type <d,et> expression such that degree expressions may take it 'át'é as a 'dummy' argument. Furthermore, I will demonstrate that at the highest level, the relevant composition operation is Predicate Modification, not Function Application. This view allows us to account for the preservation of evaluativity found in degree constructions utilizing ní⁻⁶-marked.

Throughout this section, I will specifically discuss the semantic contribution of the copula *'át'é* rather than the subordinated form *'át'éego*: following Schauber (1979), I assume that the subordinator *-go* plays an important role in the syntax but is semantically vacuous.

4.4.2.1: The type of *'át'é*

In this section, I will present two arguments in favor of identifying *'át'é* as a type $\langle d, et \rangle$ expression. The first piece of evidence is the inability of *ni*⁻⁶-marked predicates to occur in the *P-ee* 'with P' equative construction. Since all other degree constructions permit the use of *ni*⁻⁶-marked predicates (with the expected exception of measure phrase and comparative subdeletion constructions, c.f. §2.7), there is no reason why the *P-ee* equative should be permitted here: why does it not receive a reading along the lines of the 'inexact but evaluative' reading identified for *ni*⁻⁶-marked predicates used in the *-gi* equative construction? Perhaps the problem is not what is present – either the *P-ee* comparative postposition or the use of a *ni*⁻⁶-marked predicate – but rather what is not, *'át'é*. The *P-ee* equative is the only degree construction in which the standard marker is (almost always) incorporated directly into the verb, such that this is the only degree construction in which *'át'é* cannot be interposed between predicate and degree expression. Might the forced absence of *'át'é* in the *P-ee* equative prevent the use of *ni*⁻⁶-marked predicates in this degree construction?

In §4.3, I proposed that the inflected, standard-marking postposition *P-lááh* 'beyond P' takes a type $\langle d, et \rangle$ predicate *g* as an argument, where *g* is the type $\langle d, et \rangle$ result of composition between the stem *s* (type $\langle ed \rangle$) and the degree morpheme (*'á*)-*ni*⁻². The interpretation for *P-lááh* is given in (65). The result of composing *P-lááh* with gradable predicate *g* is DegP, which was identified as a type $\langle et \rangle$ expression in accordance with the Extended Projection account.

Assuming Function Application to be the operative compositional process, this makes *P-lááh* of type $\langle\langle d, et \rangle, \langle et \rangle\rangle$.

$$(64) \quad \|P-lááh\| = \lambda g \lambda x. \max(g)(x) > \max(g)(P)$$

If *P-lááh* and other degree expressions, including *P-ee*, select for a type $\langle d, et \rangle$ predicate, a type mismatch would explain the inability of *P-ee* to compose directly with a *ni*⁶-marked, type $\langle et \rangle$, predicate. One function of *'át'é* could be to provide a 'dummy' type $\langle d, et \rangle$ expression that the degree expression can take as an argument.

The second piece of evidence in favor of analyzing *'át'é* as expressions with degree arguments is that the presence of *'át'é* permits a degree question (DQ) reading for certain degree constructions where all arguments are otherwise saturated.

- (65) *Haalá yit'éego shilááh 'ánóodziil*
 wh-QPRT 3sgS-be-SUB 1sgO-BEYOND 'á-ní²-2sgS-strong
 'How much stronger are you than me?' Or: You are stronger than me, how much?
 (YM 1987: d130)

In (65), the combination of *haa* and the subordinated copula results in a DQ reading: given that the degree argument introduced by *'á-ní²* on the predicate *'ánóodziil* is already saturated by composition with the inflected degree expression *shilááh*. If we suppose that *haa*, like other degree expressions, selects for a type $\langle d, et \rangle$ expression, then the obligatory presence of the subordinated copula *yit'éego* (and the obligatory degree reading) supports the analysis presented thus far.

- (66) *Steve Robin naaki 'adées'eez yee yilááh*
 Steve Robin two inch 3sg'O-WITH 3sg'O-BEYOND
'ánífnéézígi 'át'éego Sam Peggy yilááh 'ánífnééz
'á-ní²-3sgS-tall-COMP-AT 3sgS-be-SUB Sam Peggy 3'O-BEYOND 'á-ní²-3sgS-tall

'Steve is two inches taller than Robin, just as Sam is taller than Peggy.'
 Or: 'Steve is two inches taller than Robin, (and) Sam is *that much* taller than Peggy.'
 (Ellavina Perkins, p.c.)

In (66), the standard marker *-gi* ‘at’ takes the complementized clause ‘Steve is two inches taller than Robin’ as its first argument. Again following our previous analysis, the inflected degree expression then ought to compose with a type ⟨d,et⟩ expression. The second clause ‘Sam is taller than Peggy’ is not of type ⟨d,et⟩: again, as predicted, in the absence of other suitable material, the subordinated copula composes with *-gi*. Notably, the resultant construction retains a DQ reading, where the degree is equated to ‘two inches.’ This once again provides a second piece of evidence that *‘át’éego* is introducing an unbound degree: there is no other possible source of this degree in (66b).

4.4.2.2: Precedent for the analysis

The analysis presented by Doetjes (2008) also provides precedent for assigning a morpheme in the position of *‘át’éego* the type ⟨d,et⟩. Doetjes (2008) puts forth a similar analysis for English *much* and *many* in the context of an account of why Type A morphemes (e.g., *as*, *too*, *more/er*, *very*) can only occur in the ‘bare’ form with gradable predicates. Doetjes notes that certain Type A morphemes followed by *much* and *many* can modify other lexical categories, such as mass nouns and plurals, thought not to possess degree arguments. When morphemes such as *as*, *too*, and *more/er* modify degree-less predicates and are followed by *much* or *many*, they are referred to as Type C morphemes. Recall from earlier discussion that I view Type A morphemes as analogous to Navajo degree expressions that modify (*‘á*)-*ni*²-marked predicates (e.g., *P-lááh*) while Type C morphemes are analogous to Navajo degree expressions that modify degree-less *ni*⁶-marked predicates (e.g., *P-lááh ‘át’éego*).

However, as Doetjes notes:

If the presence of a degree variable is typically adjectival, one has to assume that expressions such as *much* and *many* when used to modify mass nouns and plurals and *very*, which is used to modify an adjective, have a different semantics. Whereas *very* operates on the value of a degree variable, *much*

and *many* should be seen as quantity predicates that contain a degree variable themselves.

(Doetjes 2008: 141)

When a degree expression modifies an expression that lacks a degree argument (such as a mass noun like *books*), *much* or *many* must intercede between the degree expression and the noun. Doetjes assigns *much* and *many* the interpretations in (67a,b). These interpretations match the interpretation that she gives for gradable predicate *difficult* (67c), which is the interpretation of all gradable predicates under the relational analysis.³⁷ All three expressions in (67) are of type $\langle d, et \rangle$.

- (67) a. $\|much\| = \lambda d \lambda x. much(x) \geq d$
 b. $\|many\| = \lambda d \lambda x. many(x) \geq d$
 c. $\|difficult\| = \lambda d \lambda x. difficult(x) \geq d$ (Doetjes 2008: 141)

The interpretation of a degree construction utilizing a Type C morpheme + *many* is given in (68a,b). For the sake of comparison, the interpretation of a degree construction with a Type A morpheme is given in (68c).

- (68) a. *as many books as Sally*
 b. $\|as\ as\ d_c\| (\|many\|) = \lambda x. \exists d [d \geq d_c \wedge \|many\| (d)(x)]$
 c. $\|as\ as\ d_c\| = \lambda g \lambda x. \exists d [d \geq d_c \wedge g(d)(x)]$ (adapt. Doetjes 2008: 141)

Modification by Type A vs. Type C degree morphemes results not only in distinct semantic interpretations of the final degree constructions, but different compositional operations are used as well. In (68b), “*as many books* denotes a set of plural objects that have the property of being books *and* the property of having a quantity that at least equals a contextually given degree of quantity d_c ”. The composition of these two type $\langle et \rangle$ properties is accomplished through Predicate Modification (Doetjes 2008: 141-142). Doetjes extends this observation to all

³⁷ I have slightly modified the interpretations given in (46) such that they match those given for gradable predicates under the relational analysis in Section 1: the only difference is that Doetjes (2008) gives = rather than \geq as the relation between $g(x)$ and d .

Type A and Type C degree morphemes: whereas Type A expressions combine with gradable predicates through Function Application, Type C expressions combine through predicates through Predicate Modification (Doetjes 2008: 145).

The analysis of *much* and *many* as type $\langle d, et \rangle$ expressions lends additional credence to the analysis that I have presented as *‘át’é* being a predicate of type $\langle d, et \rangle$.

4.4.2.3: Predicate Modification

Given that *ni*-⁶-marked predicates lack open degree arguments available for saturation by a degree expression, Function Application does not appear to be the relevant process of semantic composition in degree constructions with *ni*-⁶-marked predicates. I propose that Doetjes’ appeal to Predicate Modification may further inform the account of Navajo subordinated degree expressions.

Furthermore, composition through Predicate Modification allows us to preserve the evaluative meaning intrinsic not only to *ni*-⁶-marked predicates in isolation, but in degree constructions utilizing these predicates as well. According to speakers, the truth conditions of the degree construction in (69a) can be summarized as in (69b). No free translation is given for (69a) since the truth conditions of the utterance are under consideration.

(69) a. *Shí shimá bilááh ‘át’éego nisneez*
 1sg. 1sg-mother 3sgO-BEYOND 3sgS-be-SUB *ni*-⁶-1sgS-tall

b. Utterance (69a) is true just in case ‘I’ is taller than ‘my mother’ *and* ‘I’ is tall to a degree exceeding a contextual standard of comparison.

Or: I am taller than my mother *and* tall in an evaluative sense. (Ellavina Perkins, p.c.)

These truth conditions seem ideally suited to composition through Predicate Modification. In Predicate Modification to take place, two type $\langle et \rangle$ expressions are coordinated:

(70) If α is a branching node, $\{\beta, \gamma\}$ is the set of α ’s daughters, and $[[\beta]]$ and $[[\gamma]]$ are both in D_{et} then:
 $[[\alpha]] = \lambda x \in D_e. [[[\beta]](x) = [[\gamma]](x) = 1]$ (Heim and Kratzer 1998: 65)

Thus, we have two guidelines as we propose a semantic derivation for a degree construction with a *ni*-⁶-marked predicate. First, we want to end up with two expressions of type ⟨et⟩ such that Predicate Modification can take place. We already know that the *ni*-⁶-marked predicate will be one of the two ⟨et⟩ expressions: the clear choice for the second ⟨et⟩ expression is the subordinated degree expression (e.g., *P-lááh 'át'éego*). Our second guideline is that *'át'é* will be an expression of type ⟨d,et⟩ such that it may contribute a degree argument (along the lines of English *much* and *many*) and so the degree expression (e.g., *P-lááh*) may take this predicate as an argument.

4.4.2.4: Composing *'át'é*

However, the gradable predicate *g* (type ⟨d,et⟩) that composes with the degree expression cannot be *'át'é* alone: while I have argued that *'át'é* is the right semantic type to compose with the degree expression (as shown in (71a), this would produce an expression with an interpretation as in (71b) that lacks a ‘real’ gradable predicate (*tall, large, pretty, etc.*) meaning. Rather, (71b) would have a meaning along the lines of ‘the maximal degree to which *x* is *'át'é* exceeds the maximal degree to which *y* is *'át'é*.’

- (71) a. $(y\text{-}l\acute{a}áh)(g) = [\lambda g \lambda x. \max(g)(x) > \max(g)(y)]('át'é)$
 b. $\lambda x. \max('át'é)(x) > \max('át'é)(y)$

How can the meaning of the matrix clause gradable predicate (e.g., *-neez* ‘tall’) be mapped onto *'át'é*? If we propose that the (semantically bleached) *'át'é* behaves as a verbal anaphor and picks up the interpretation of the nearest available gradable predicate, here *-neez* ‘tall’. However, this account is foiled by the absence of a gradable predicate ‘tall’ of type ⟨d,et⟩ at all any point in the derivation: our two options are *-neez* (⟨ed⟩) and *nineez* (⟨et⟩). Thus, we

cannot simply ‘trade’ one type $\langle d, et \rangle$ expression for another, such as the semantically bleached ‘*át’é* for a predicate denoting ‘tall’.

Can we further divide the derivation such that we do not have to find a type $\langle d, et \rangle$ expression at all? One possibility is that ‘*át’é* is of type $\langle \langle ed \rangle \langle d, et \rangle \rangle$, taking a measure function as an argument and generating a function from degrees to properties of individuals. Recall from discussion in §4.3 that this is precisely the same semantic type assigned to degree morphemes (*á*)-*ni*-². In effect, ‘*át’é* is ‘standing in’ as degree morphology, composing with a locally available gradable predicate stem (here, *-neez*) and generating an expression of the right type to compose with the degree expression *P-lááh*.

Stated in more formal terms:

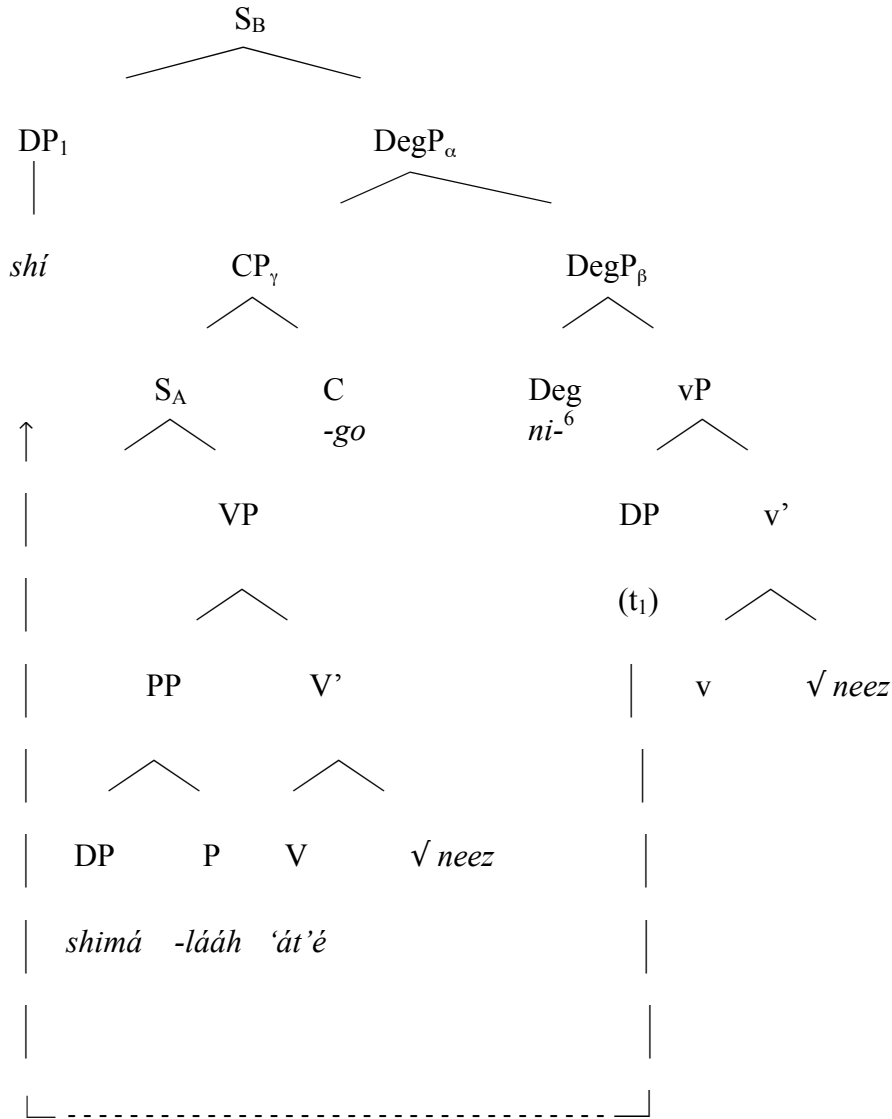
In the context of degree construction, the copula ‘*át’é* is a type-shifting operator that converts a measure function into a gradable predicate. Or, ‘*át’é* is a function from $\langle ed \rangle$ to $\langle d, et \rangle$ such that the $\langle et \rangle$ assigned to each d in the output is determined by whether that e is mapped to that d in the input.

4.4.3: Implementing the analysis

In TREE N, I show how the syntax and semantics of a comparative construction with a *ni*-⁶-marked predicate. The interpretation of *-lááh*, given in (72b), remains identical. The entry in (72d) shows the full interpretation after composition through Predicate Modification is complete. The syntactic and semantic derivation is given in TREE N. A detailed account of the derivation follows. In the following interpretations, s is a verb stem of a gradable predicate, a measure function of type $\langle ed \rangle$ (given as δ_{tall} in the derivations); g is a gradable predicate of type $\langle d, et \rangle$ (given as *d-tall* in the derivations). z is an individual of type $\langle e \rangle$; and d is a degree of type $\langle d \rangle$.

- (72) a. (*Shí*) *shimá* *bilááh* *‘át’éego* *‘ánísnééz*
 1sg. 1sg-mother 3sgO-BEYOND 3sgS-be-SUB *ni*⁻⁶-1sgS-tall
 ‘I am taller than my mother.’
 b. $\| -lááh \| = [\lambda y \lambda g \lambda x. \max(g)(x) > \max(g)(y)]$
 c. $\| ni_nééz \| = \lambda d \lambda z. \delta_{tall}(z) \geq STND(\delta_{tall})$
 d. $[\max(d-tall)(I) > \max(d-tall)(my\ mother)] \wedge [\delta_{tall}(I) \geq STND(\delta_{tall})]$

Tree N: *Shí shimá bilááh ‘át’éego nisneez*



(A) *Derivation of DegP*

$$[{}_{\text{Deg}} \textit{ni}] = \lambda s \lambda z. s(z) \geq \text{STND}(s)$$

Composition with *-neez* ‘tall’:

$$[\lambda s \lambda z. s(z) \geq \text{STND}(s)](\delta_{\text{tall}})$$

$$\text{Deg}' = \lambda z. \delta_{\text{tall}}(z) \geq \text{STND}(\delta_{\text{tall}})$$

DegP is realized as *ni_neez*. Note that the semantic type of *ni_neez* is $\langle \text{et} \rangle$. Thus, *ni*⁻⁶ has converted the gradable predicate from a measure function (type $\langle \text{ed} \rangle$) into a property of individuals (type $\langle \text{et} \rangle$). This makes the type of *ni*⁻⁶ $\langle \langle \text{ed} \rangle \langle \text{et} \rangle \rangle$,

(B) *Derivation of PP*

$$\| \textit{-lááh} \| = \lambda y \lambda g \lambda x. \max(g)(x) > \max(g)(y)$$

Composition with *shimá* ‘my mother’:

$$[\lambda y \lambda g \lambda x. \max(g)(x) > \max(g)(y)](\textit{shimá})$$

$$\text{PP} = [\lambda g \lambda x. \max(g)(x) > \max(g)(\text{my mother})]$$

The comparative postposition *-lááh* composes with *y*, the standard of comparison (type $\langle \text{e} \rangle$). Composition with the standard of comparison (here, *shimá*) triggers inflection on the postposition. The standard of comparison and inflected postposition [*shimá bilááh*] is indicated as PP in TREE N. The fully inflected PP is the degree expression: as in derivation given in §4.3.1, PP is an expression of type $\langle \langle \text{d}, \text{et} \rangle \langle \text{et} \rangle \rangle$, taking a type $\langle \text{d}, \text{et} \rangle$ gradable predicate as an argument and producing a property of individuals.

(C) *Derivation of V'*

$$\| \textit{'át'é} \| = \lambda s \lambda d \lambda z. s(z) \geq d$$

Composition with *√neez*:

$$\text{V}' = [\lambda s \lambda d \lambda z. s(z) \geq d](\delta_{\text{tall}})$$

$$\text{V}' = \lambda d \lambda z. \delta_{\text{tall}}(z) \geq d$$

At this stage in the derivation, the copula *'át'é* (type $\langle \langle \text{ed} \rangle \langle \text{d}, \text{et} \rangle \rangle$) composes with the measure function *-neez* ‘tall’, abbreviated in the interpretation as δ_{tall} . The resulting V' is a type $\langle \text{d}, \text{et} \rangle$ expression. At later stages in the derivation, I will refer to this morpheme as *d-tall*, the

same abbreviation used to refer to the type $\langle d, et \rangle$ 'ání_nééz. However, note that this form of *d-tall*, 'át'é_{-neez}, is pronounced as 'át'é: the presence of the *-neez* is only made known in the semantic derivation.

(D) *Derivation of VP*

Composition with 'át'é_{-neez}:

$$VP = [\lambda g \lambda x. \max(g)(x) > \max(g)(\text{my mother})]('át'é_{-neez})$$

$$VP = [\lambda x. \max(d\text{-tall})(x) > \max(d\text{-tall})(\text{my mother})]$$

The VP maximal projection is derived through composition of V' (or, 'át'é_{-neez}) and the degree expression (here, the PP *shimá bilááh* 'beyond my mother'). The copula 'át'é_{-neez} is taken as an argument by the degree expression and is substituted for both instances of *g* in the interpretation. Given that the type of PP was $\langle\langle d, et \rangle \langle et \rangle\rangle$, composition with the type $\langle d, et \rangle$ gradable predicate produces a type $\langle et \rangle$ property of individuals.

(E) *Derivation of S_A and CP*

The semantic content of VP percolates unchanged to S. The subject of S will ultimately be the topic of comparison, the same subject as used for the matrix predicate. For the moment, however, S is an expression of type $\langle et \rangle$. The semantic content of S again percolates to the CP level (the S marked with the subordinator *-go*). CP is of type $\langle et \rangle$.

A type $\langle et \rangle$ expression was also produced in the derivation of the comparative construction with an ('á)-*ni*⁻²-marked predicate, c.f. §4.3.1. However, in that derivation, since the matrix gradable predicate (e.g., 'ání_nééz) was of type $\langle d, et \rangle$, the degree expression was able to compose directly with the matrix gradable predicate to produce a type $\langle et \rangle$ expression at the level of DegP: there was only one type $\langle et \rangle$ expression in the course of the derivation. Here, the $\langle et \rangle$ CP has been produced in tandem with another $\langle et \rangle$ expression, DegP_β (the *ni*⁻⁶-marked predicate *ni_neez*).

(F) *Derivation of DegP_α through composition of CP and DegP_β*

Given that both CP and DegP_β are expressions of type ⟨et⟩, neither CP nor DegP_β is of a type suitable to take the other as an argument and Function Application cannot be the right compositional operation. Following the discussion in §4.4.2.3, I propose that Predicate Modification is at work in the composition of CP and DegP_β.

Modifying slightly the definition of Predicate Modification given in (70) to use \wedge rather than [...=...], we assign α to DegP_α, β to DegP_β, and γ to CP_γ. Both DegP_β and CP_γ are type ⟨et⟩ expressions. Where the topic of comparison x (here, *shí* ‘I’) is taken by an argument by both DegP_β and CP_γ, the resultant type ⟨t⟩ propositions should equal 1 when coordinated. Composition of DegP_α proceeds as shown below, where w is individual of type ⟨e⟩.

$$\text{DegP} = \lambda w[[\lambda x.\text{max}(d\text{-tall})(x) > \text{max}(d\text{-tall})(\text{my mother})](w) \wedge \lambda z[\delta_{\text{tall}}(z) \geq \text{STND}([\delta_{\text{tall}}])](w)]$$

$$\text{DegP} = \lambda w[[\text{max}(d\text{-tall})(w) > \text{max}(d\text{-tall})(\text{my mother})] \wedge [\delta_{\text{tall}}(w) \geq \text{STND}(\delta_{\text{tall}})]]$$

(G) *Derivation of S*

Composition with *shí* ‘I’:

$$S = \lambda w[[\text{max}(d\text{-tall})(w) > \text{max}(d\text{-tall})(\text{my mother})] \wedge [\delta_{\text{tall}}(w) \geq \text{STND}(\delta_{\text{tall}})]](\text{shí})$$

$$S = [\text{max}(d\text{-tall})(I) > \text{max}(d\text{-tall})(\text{my mother})] \wedge [\delta_{\text{tall}}(I) \geq \text{STND}(\delta_{\text{tall}})]$$

Or, with the interpretations of *d-tall* fully expanded:

$$[\text{max}(\lambda d'.\delta_{\text{tall}}(I) \geq d') > \text{max}(\lambda d''.\delta_{\text{tall}}(\text{mother}) \geq d'')] \wedge [\delta_{\text{tall}}(I) \geq \text{STND}(\delta_{\text{tall}})]$$

When DegP_α composes with the topic of comparison *shí* ‘I’, the remaining type ⟨e⟩ argument positions of both DegP_β and CP are saturated simultaneously. The final interpretation of S is true just in case ‘I’ am taller than ‘my mother’ *and* ‘I’ am taller than a contextual standard of comparison. This translation captures the truth conditions for the original Navajo utterance (Ellavina Perkins, p.c.).

4.5: Summary

In Section 4, we took an exploratory journey through the syntax and semantics of Navajo degree constructions. In doing so, the interpretations for *ni*-⁶ and (*'á*)-*ni*-² proposed in Section 2 were brought together with the analysis presented in Section 3, wherein degree morphology determines the semantic type of the gradable predicate ($\langle\langle d, et \rangle\rangle$ or $\langle et \rangle$) while the degree expression introduces the ordering relation and other semantic pieces necessary for the interpretation of a full degree construction. The account of Navajo degree constructions with *ni*-⁶-marked gradable predicates proved remarkably similar to Doetjes' (2008) account of degree morphemes proposed to modify predicates without degree variables. Under both accounts, an additional morpheme (*'át'é* in Navajo, *much/many* in English) was necessary to provide the right sort of argument to compose with degree expressions (in Navajo) or degree morphology (in English). Furthermore, Predicate Modification (rather than Function Application) was identified as the compositional operation at work in degree constructions involving degree-less predicates.

5: Conclusions

Ultimately, this thesis has taken the shape of an arc where each base is rooted in the search for a cross-linguistically adequate account of gradable predicates and degree constructions. In Section 1 (the first base of the arc) the relational analysis – the standard account – was introduced and shown to account for data from languages as typologically disparate as Japanese and English. However, questions arose at the end of Section 1 when I noted two possible typological features that would prove challenging for the relational analysis: first, if gradable predicates in some language X could be demonstrated to not be universally of type $\langle d, et \rangle$; second, if both degree morphology and standard markers in some language X were found to not be semantically vacuous.

In Section 2, a selection of data from Navajo was presented to demonstrate that both of these potential challenges are manifested in Navajo. Degree morphology ((*á*)-*ni*⁻² and *ni*⁻⁶) determines the semantic type of the gradable predicates it marks, such that the most basic form of the gradable predicate (here, the verb stem) cannot be of type <d,et> as under the relational analysis. Furthermore, the locative and directional standard markers are clearly responsible for introducing the ordering relation in degree constructions. At this point in the discussion (the apex of the arc), the relational analysis could not be claimed as the right analysis of gradable predicates and degree constructions in Navajo, calling into question its cross-linguistic applicability.

Sections 3 and 4 formed the second base of the arc where the Navajo data were shown to strongly support an alternate analysis that also seeks cross-linguistic applicability (Kennedy 2007a). Under this new analysis, standard markers introduce the ordering relation and degree morphology plays a reduced role in the semantics. The Navajo data show one way in which degree morphology may function in this analysis. In Section 4, the analysis developed for Navajo was exemplified with two full derivations of degree constructions.

This study of Navajo not only brought to light a number of ways in which the semantics of comparison may vary in individual languages, but also strongly suggests that this variation can be still accounted for in terms of a unified approach to the semantics of gradable predicates and degree constructions.

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