

On the Semantics of Two Types of Adjectives in Nuosu Yi

Abstract

In this paper, we discuss two types of dimensional adjectives in Nuosu Yi, which we refer to as Positive adjectives (PAs) and Equative Adjectives (EAs). We show that PAs and EAs are subject to different distributions in gradation structures: EAs are only admissible in gradation structures that can be associated with measure phrases, which include differential comparatives (e.g., *Ayi is 2 cm taller than Aguo.*) and degree questions (e.g., *How tall is Ayi?*). PAs are licensed elsewhere, for example, comparatives that do not introduce a differential (e.g., *Ayi is taller than Aguo.*), the intensification construction (e.g., *Ayi is very tall*), the superlative construction (e.g., *Ayi is the tallest*), etc. We also observe that degree morphology in Nuosu Yi, unlike that in English, does not lexically select for gradable adjectives; it modify gradable and non-gradable predicates alike. Based on these two main observations, we propose that PAs and EAs are semantically distinct: PAs are context sensitive predicates that do not introduce a degree argument (of type $\langle e, t \rangle$); EAs are degree predicates (of type $\langle d, \langle e, t \rangle \rangle$). Our analysis provides new empirical support for the Degree Semantic Parameter in Beck et al (2009)(i.e., languages may vary with respect to whether their adjectives introduce a semantic degree argument). It also provides an empirical basis for a close examination on the relation between vague predicates and degree predicates.

Key Words

Comparisons, degrees, gradability, vagueness, Nuosu Yi

1. Introduction

It has been argued that languages may vary with respect to whether their gradable predicates can introduce a degree argument, which Beck et al (2009) dub ‘Degree Semantic Parameter’ (DSP), as shown in (1).

- (1) Degree Semantic Parameter (DSP):
 A language {does/does not} have gradable predicates (type <d, <e, t>> and related), i.e., lexical items that introduce degree arguments.

English, for example, is a language that has a positive setting for the DSP. Gradable adjectives (e.g., *tall*), on the standard degree-based analyses, introduce a degree argument (i.e., 2), which can either be saturated with a measure phrase (e.g., 3a) or be bound by a degree quantifier such as a comparative marker *-er* (e.g., 3b).

- (2) $[[tall]] = \lambda d \lambda x. x \text{ is (at least) tall to } d.$
- (3) a. John is *6 feet* tall.
 b. John is *taller* than 6 feet.

Some languages, unlike English, have a negative setting for the DSP. Bochnak (2013, 2015) has convincingly shown that in a Native American language, namely Washo, gradable adjectives lack a degree argument; there is no degree morphology that quantifies over or modifies the degree argument. In his analysis, adjectives like *tall* in Washo is a context-sensitive vague predicate as shown in (4).

- (4) $[[tall_{washo}]]^c = \lambda x. x \text{ counts as tall in } c.$

In this paper we show that in Nuosu Yi (Tibeto-Burman) there are two classes of dimensional adjectives, which we refer to as Positive Adjectives (PAs), exemplified in (5)¹, and Equative Adjectives (EAs), exemplified in (6).² We argue that these two classes of adjectives are semantically distinct: PAs are vague predicates that do not introduce a degree argument like (4), and EAs are degree adjectives like (2).

- (5) a. Context: Ayi is 6 feet. Compared to the average Nuosu Yi women, she is tall.
 b. $a^{33} z_i^{55}$ (li³³) $a^{34} z_i^{33}$. [PA]
 Ayi TOP tall
 ‘Ayi is tall.’

¹ All the Nuosu Yi examples, unless otherwise specified, were collected in the fieldwork in the Xichang, Sichuan in 2010 and the Mianning County, Sichuan in 2011.

² Abbreviation used in the paper: ADVL = adverbializer; CL = classifier; COP = Copular; DP = Dynamic Perfect; DET = Determiner; EXH= Exhaustion Particle; EXP = Experiential; LOG = Logophor; NEG = Negation; RECL = Reciprocal; SFP = Sentence Final Particle; QUO = Quotation; TOP = Topic marker.

- (6) a. Context: Ayi is 6 feet. Aguo is 5 feet 6. Ayi is at least as tall as Aguo.
 b. $a^{33} \text{zi}^{55}$ $a^{55} \text{ko}^{33}$ zi^{21} . [EA]
 Ayi Aguo as tall as
 ‘Ayi is (at least) as tall as Aguo.’

Comparing the PA $a^{34} \text{zi}^{33}$ ‘tall’ in (5b) with the EA zi^{21} ‘(at least) as tall as’ in (6b), the former differs from the latter in the presence of the prefix a^{34} - and a tonal difference between 33 and 21. To the best of our knowledge, there are only ten PAs in Nuosu Yi that have an EA counterpart, all of which belong to dimensional adjectives (see table A). Non-dimensional adjectives such as ndza^{55} ‘pretty’ or $o^{33} \text{bu}^{33}$ ‘smart’, for example, do not have an EA counterpart.³

Table A: PAs and EAs in Nuosu Yi

Positive		Negative		Equative
$a^{34} \text{zi}^{33}$	‘big, tall’	$\varepsilon^{55} \text{tsi}^{33}$	‘small, short’	zi^{21}
$a^{34} \text{ni}^{33}$	‘many’	$i^{34} \text{ni}^{33}$	‘few’	ni^{21}
$a^{33} \text{fu}^{33}$	‘thick’ (of long, cylindrical objects)	$i^{34} \text{fu}^{33}$	‘thin’	fu^{21}
$a^{33} \text{dzi}^{33}$	‘wide’	$i^{34} \text{dzi}^{33}$	‘narrow’	dzi^{21}
$a^{33} \text{tu}^{33}$	‘thick’ (of flat objects)	$i^{34} \text{tu}^{33}$	‘thin’	tu^{21}
$a^{33} \text{fi}^{33}$	‘wide’ (of long objects)	$i^{34} \text{fi}^{33}$	‘narrow’	fi^{21}
$a^{33} \text{mu}^{33}$	‘high, deep’	$i^{34} \text{mu}^{33}$	‘shallow’	mu^{21}
$a^{34} \text{li}^{33}$	‘heavy’	$\text{zo}^{34} \text{so}^{33}$	‘light’	li^{21}
$a^{33} \text{xo}^{33}$	‘thick’ (of long, cylindrical objects)	$i^{34} \text{xo}^{33}$	‘narrow’	xo^{21}
$a^{33} \text{so}^{33}$	‘long’ (of distance or shapes)	$i^{34} \text{so}^{33}$	‘short’	so^{21}

Interestingly, both PAs and EAs are allowed in gradation structures, but they are subject to different distributions. EAs appear in gradation structures that can be typically associated with measure phrases. These include differential comparatives (e.g., *Ayi is 2 cm taller than Aguo*) and degree questions (e.g., *how tall is Ayi?*). PAs appear elsewhere, including the comparison construction that does not express differentials, the intensification construction (e.g., *Ayi is very tall*), the excessive construction (e.g., *Ayi is too tall*), and the superlative construction (e.g., *Ayi is the tallest*).

³ Although almost all the positive adjectives in table A bear a prefix a^{33} - or a^{34} -, this prefix can also appear in non-dimensional adjectives, for example, $a^{33} \text{si}^{33}$ ‘yellow’ and $a^{34} \text{ko}^{33}$ ‘hard, stiff’, $a^{34} \text{li}^{33}$ ‘old, used’, etc. Section 5 attempts a decompositional analysis of PAs and EAs.

In addition, we also observe that unlike the degree morphemes in English such as *-er*, *very*, *too*, *enough*, etc., which select for gradable adjectives, ‘degree’ morphology in Nuosu Yi lacks this selectional restriction; they modify gradable adjectives and non-gradable predicates (e.g., non-gradable verbs like *run*) alike. Based on these two empirical observations above, we propose that adjectives in Nuosu Yi, except for EAs, do not introduce a degree argument.

The rest of the paper is structured as follows. In section 2, we present an empirical picture of the gradation structures in Nuosu Yi. In Section 3, we dismiss the possibility that the two comparison constructions for PAs and EAs in Nuosu Yi can be analyzed along the distinction between explicit comparison (e.g., *John is taller than Mary*) and implicit comparison (e.g., *compared to Mary, John is tall*) in Kennedy (2007). In section 4, we put forward our proposal that PAs and EAs are semantically distinct: PAs are context-sensitive vague predicate like (4) while EAs are degree predicates like (1). We show how this analysis explains the complementary distributions of PAs and EAs in the gradation structures. In section 5, we look at the cross-categorical nature of ‘degree’ modifiers in Nuosu Yi and show that they quantify over either the contextual parameter of the gradable adjectives or the event argument/ contextual parameter of non-gradable predicates. In section 6, we discuss the possible relation between PAs and EAs. In section 6, we compare dimensional adjectives in Nuosu Yi to those in Navajo and Russian and discuss differences among them. In section 7, we point out some remaining open questions and conclude the paper.

2. Gradation structures in Nuosu Yi

2.1 Gradation structures for PAs

PAs have a wider distribution than EAs; they are allowed in comparatives that do not introduce differentials, equatives, exclamatives, intensification, excessives and superlatives. In this section, let us look at the distribution of PAs.

Comparison (with no differentials): the sentence in (7) exemplifies the comparative structure for PAs.

- (7) $a^{33}z\dot{i}^{55}$ $a^{55}k\dot{o}^{33}$ $t\dot{c}o^{34}$ $a^{21}tsh\eta^{33}$ mu^{33} $a^{34}z\dot{i}^{33}$.
 Ayi Aguo toward exceed ADVL tall
 ‘Ayi is taller than Aguo.’

In (7), Ayi is the target of the comparison; Aguo is the standard of comparison. $t\dot{c}o^{34}$ is a preposition that indicates direction, as shown in (8).

- (8) $mu^{33}ka^{55}$ ηa^{55} $t\dot{c}o^{21}$ hi^{21} ko^{33} i^{33} $a^{21}-la^{33}$ o^{34} di^{34} .
 Muga 1sg toward say TOP LOG NEG-come SFP QUO
 ‘Muga_i said to me that he_i would not come.’

$a^{21}tsh\eta^{33}$ morphologically consists of a negation particle a^{21} , as shown in (9), and the morpheme $tsh\eta^{33}$. As far as we know, $tsh\eta^{33}$ does not appear elsewhere except in $a^{21}tsh\eta^{33}$. In the paper, we gloss $a^{21}tsh\eta^{33}$ as ‘to exceed’.

- (9) a³³ ʒi⁵⁵ a²¹ ndza⁵⁵
 Ayi NEG-pretty
 ‘Ayi is not pretty’

The morpheme *mu*³³ is an adverbializer that can mark either a manner adverbial or an adverbial clause, as shown in (10) and (11).

- (10) a³³ ʒi⁵⁵ li³³ [dzo²¹ dʒi³³ mu³³] do²¹ hi²¹.
 Ayi TOP natural ADVL words speak
 ‘Ayi speaks naturally.’

(Gerner 2013: 18)

- (11) tshɿ³³ [i³¹kho³³ a³¹ ndzu³³ mu³³] bi⁵⁵bo³³ o⁴⁴.
 3sg door NEG-lock ADVL go.out SFP
 ‘He left with the door unlocked.’

(Hu 2002: 226)

In the context where it is clear that Ayi and Aguo’s heights are under comparison, (7) can be reduced to (12), leaving out the adjective a³⁴ ʒɿ³³ ‘tall’ and the adverbializer *mu*³³.

- (12) a³³ ʒi⁵⁵ a⁵⁵ko³³ tɕo³⁴ a²¹tshɿ³³.
 Ayi Aguo toward exceed
 ‘Ayi exceeds Aguo (with respect to some property salient in the context).’

It is important to note that the comparative in (7) does not allow a differential measure phrase that describes the difference between Ayi and Aguo’s heights. (13) is ungrammatical no matter where and how the differential measure phrase ni²¹ko³³ve³³ ‘2 cm’ appears in the sentence.

- (13) a³³ ʒi⁵⁵ a⁵⁵ ko³³ tɕo³⁴ a²¹ tshɿ³³ mu³³ a³⁴ ʒɿ³³ *(ni²¹ko³³ve³³).
 Ayi Aguo towards exceed ADVL tall 2 cm
 Intended: Ayi is 2 cm taller than Aguo.

Equatives (*exactly as Adj as*): Nuosu Yi has a designated construction that expresses *exactly as Adj as*, as shown in (14). Compared to the EA in (6), the equative construction in (14) is only acceptable in contexts where Ayi and Aguo are of exactly the same height.

- (14) a³³ ʒi⁵⁵ si³³ ni²¹ a⁵⁵ ko³³ dʒɿ³³ su³⁴ mu³³ ndza⁵⁵.
 Ayi and Aguo RECL resemble ADVL pretty
 ‘Ayi and Aguo are as pretty as each other.’

In (14), *dʒɿ*³³ is a reciprocal morpheme, which can be pre-fixed to a transitive verb to express ‘V each other’, as shown in (15).

- (15) ηa^{21} ηi^{21} $d\zeta l^{33}$ $h\epsilon^{33}vu^{33}$.
 we two RECL like
 ‘We both like each other.’

Exclamatives: In Nuosu Yi, exclamatives are expressed by adding the *WH*-word *khur*²¹ ‘how’ and the adverbializer *mu*³³ in front of a PA, as shown below.

- (16) a. Context: the speaker has never seen Ayi before. On their first encounter, he found Ayi very pretty.
 b. a^{33} ζi^{55} $khur^{21}$ mu^{33} $ndza^{55}$.
 Ayi how ADVL pretty
 ‘How pretty Ayi is!’ (Exclamative)
 *‘How pretty is Ayi?’ (Degree question)

Note that (16b) cannot be interpreted as a degree question meaning ‘How pretty is Ayi?’, although the *WH*-word *khur*²¹ *mu*³³ can precede a non-gradable verb to form a manner question, as shown in (17).

- (17) $ha^{33}pi^{55}$ $tsh\eta^{34}$ $\zeta\epsilon^{55}$ $khur^{21}$ mu^{33} $\text{tu}^{55}?$
 vegetable this kind how ADVL cook
 ‘How to cook this kind of vegetable?’ (Gerner 2013: 173)

Intensification: The intensification structure in Nuosu Yi is expressed through the infix *-d\zeta l*³³, which conjoins a gradable PA and its duplicated copy, as shown in (18):

- (18) a^{33} ζi^{55} a^{34} ζl^{33} *-d\zeta l*³³ a^{34} ζl^{33}
 Ayi tall-very-tall
 ‘Ayi is very tall.’

*-d\zeta l*³³ can also conjoin non-gradable verbs or non-gradable nouns, as shown in (19) and (20):

- (19) a^{33} ζi^{55} ηo^{33} *-d\zeta l*³³ ηo^{33} .
 Ayi cry-very-cry
 ‘Ayi is crying bitterly.’

- (20) $tsh\eta^{21}$ $khur^{33}$ a^{33} *d\zeta l*³⁴ ma^{33} $khur^{33}$ *-d\zeta l*³³ $khur^{33}$ ma^{33} ηu^{33} .
 his dog this CL dog-very-dog CL COP
 His dog is a real dog.

(Gerner 2013: 450)

Excessives: The excessive construction in Nuosu Yi is expressed through the morpheme *k\zeta*³³, as shown in (21).

- (21) a^{33} ζi^{55} a^{34} ζl^{33} $k\zeta^{33}$.
 Ayi tall too
 ‘Ayi is too tall.’

- (7) a³³zi⁵⁵ [a⁵⁵ko³³ tɕo³⁴ a²¹tshɿ³³ mu³³] a³⁴ʒɿ³³.
 Ayi Aguo toward exceed ADVL tall
 ‘Ayi is taller than Aguo.’

In contrast to (7), (26) allows differential measure phrases to express the difference between Ayi and Aguo’s heights, as shown in (27).

- (27) a³³zi⁵⁵ ni²¹ko³³vɛ³³ a⁵⁵ko³³ ʒɿ²¹ a²¹tshɿ³³.
 Ayi 2 cm Aguo as tall as exceed
 ‘Ayi is 2cm taller than Aguo.’

Equatives (*exactly as Adj as*): the EA ʒɿ²¹ can be prefixed with the reciprocal morpheme dʒɿ³³ to express *exactly as tall as*, as shown in (28).

- (28) a³³zi⁵⁵ si³³ni²¹ a⁵⁵ko³³ dʒɿ³³ ʒɿ³⁴.
 Ayi and Aguo RECL as tall as
 ‘Ayi and Aguo are as tall as each other.’

Degree questions/Exclamatives: Degree questions are formed by adding the *WH*-word *khur*²¹ ‘how’ directly in front of an EA, as shown in (29).⁴

- (29) a³³zi⁵⁵ (ko²¹po³³) khur²¹ ʒɿ³⁴.
 Ayi body how as tall as
 (i) ‘How tall is Ayi?’
 (ii) ‘How tall Ayi is!’

Unlike (16)(repeated below), (29) does not have the adverbializer *mu*³³. It has both an exclamative reading and an interrogative reading.

- (16) a³³zi⁵⁵ khur²¹ mu³³ ndza⁵⁵.
 Ayi how ADVL pretty
 ‘How pretty Ayi is!’ (Exclamative)
 *‘How pretty is Ayi?’ (*Degree question)

Measure Phrases: EAs, like PAs, are also incompatible with measure phrases.

- (30) *a³³zi⁵⁵ ni²¹mi³³ ʒɿ²¹.
 Ayi 2 meter as tall as
 Intended: ‘Ayi is 2 meters tall.’

⁴ In (29), ʒɿ³⁴ undergoes a tonal change from 21 to 34 due to the tone sandhi rule which says when two syllables bearing 21 tone appear next to each other, the second one changes to 34 tone.

2.3 Summary

The table below summarizes the gradation structures for PAs and EAs which we have reviewed in this section.

Table B: the gradation structures in Nuosu Yi

Construction	PAs	EAs
Comparatives	(7) a ³³ z̄i ⁵⁵ a ⁵⁵ kɔ ³³ tɕo ³⁴ a ²¹ tshɿ ³³ mu ³³ a ³⁴ z̄ɿ ³³ . Ayi Aguo toward exceed ADVL tall 'Ayi is taller than Aguo.'	(26) a ³³ z̄i ⁵⁵ a ⁵⁵ kɔ ³³ z̄ɿ ²¹ a ²¹ tshɿ ³³ . Ayi Aguo as tall as exceed 'Ayi is taller than Aguo.'
Differential Comparatives	*	(27) a ³³ z̄i ⁵⁵ ni ²¹ kɔ ³³ vɛ ³³ a ⁵⁵ kɔ ³³ z̄ɿ ²¹ a ²¹ tshɿ ³³ . 'Ayi is 2cm taller than Aguo.'
Equatives (exactly as...as)	(14) a ³³ z̄i ⁵⁵ si ³³ ni ²¹ a ⁵⁵ kɔ ³³ dz̄ɿ ³³ su ³⁴ mu ³ ndz̄a ⁵⁵ . Ayi and Aguo RECL resemble ADVL pretty 'Ayi and Aguo are as pretty as each other.'	(28) a ³³ z̄i ⁵⁵ si ³³ ni ²¹ a ⁵⁵ kɔ ³³ dz̄ɿ ³³ z̄ɿ ³⁴ . Ayi and Aguo RECL as tall as 'Ayi and Aguo are as tall as each other.'
Exclamatives	(16) a ³³ z̄i ⁵⁵ khu ²¹ mu ³³ ndz̄a ⁵⁵ . Ayi how ADVL pretty 'How pretty Ayi is!' (Exclamative)	(29) a ³³ z̄i ⁵⁵ (ko ²¹ po ³³) khu ²¹ z̄ɿ ³⁴ . Ayi body how as tall as 'How tall Ayi is!' (Exclamative)
Degree Questions	*	(29) a ³³ z̄i ⁵⁵ (ko ²¹ po ³³) khu ²¹ z̄ɿ ³⁴ . Ayi body how as tall as 'How tall is Ayi?' (Degree question)
Intensification	(18) a ³³ z̄i ⁵⁵ a ³⁴ z̄ɿ ³³ -dz̄ɿ ³³ - a ³⁴ z̄ɿ ³³ . Ayi tall-very-tall 'Ayi is very tall.'	*
Excessives	(21) a ³³ z̄i ⁵⁵ a ³⁴ z̄ɿ ³³ kɔ ³³ . Ayi tall too 'Ayi is too tall.'	*
Superlatives	(23) i ³³ ti ³⁴ a ³³ dz̄ɿ ³⁴ gu ³³ phu ³³ dzo ³³ sa ⁵⁵ . clothing that CL expensive EXH 'That garment is the most expensive.'	*
MPs	*	*

Among the three gradation structures for EAs, the equative construction that expresses *exactly as...as* involves the transitive use of the EA in (6). Let us put aside this construction for the moment and only focus on differential comparatives and degree questions/exclamatives. These two structures have in common that they can be associated with measure phrases: differential comparatives make use of measure phrases to express the difference two objects under comparison; degree questions target measure phrases as answers. So here arises our first question: why is it the case that EAs are only admissible in gradation structures associated with measure phrases?

Beyond that, another important empirical observation that emerges from the description above is that in Nuosu Yi there seems to be no designated degree modifiers that only modify gradable adjectives. The comparative and the equative constructions for PAs are essentially based on the adverbial construction; the exclamative marker--*khu*²¹ *mu*³³, the intensification marker--*dz̄ɿ*³³-, the excessive marker--*kɔ*³³-, and the superlative marker--*sa*⁵⁵ modify both

gradable adjectives and non-gradable predicates. Therefore, the second question is: what is the semantics of the ‘degree’ modifiers in Nuosu Yi such that they can modify both gradable and non-gradable predicates?

Before tackling these two questions, in the following section we take a moment to consider a well-known distinction between two types of comparison in the literature (Kennedy 2007, 2011): explicit comparison and implicit comparison. We show that the two comparatives for PAs and EAs (e.g., 7 & 26) do not fall into this distinction.

3. Two modes of comparison: explicit vs implicit comparison

Kennedy (2007) observes that the comparatives in (31a-b) exemplify two different types of comparison, which he calls explicit and implicit comparison.

- (31) a. John is taller than Mary. (Explicit comparison)
b. Compared to Mary, John is tall. (Implicit comparison)

The distinction between the two types of comparison can be shown by the following four tests: (i) (non-) acceptability in crisp judgment contexts; (ii) (non-)acceptability with minimum standard predicates; and (iii) (non-)acceptability with differential measure phrases, and (iv) negative implicatures to the positive form.

Crisp judgment contexts: Kennedy observes that (31a) and (31b) differ in the acceptability in crisp judgement contexts where John and Mary’s heights only differ by a very small amount. In such a context, only (31a) is felicitous.

- (32) Context: John is 170cm; Mary is 169cm.
a. John is taller than Mary. (Explicit comparison)
b. ??Compared to Mary, John is tall (Implicit comparison)

Adjectives with minimum standards: only comparatives of explicit comparison are compatible with adjectives with an inherent minimum standard (e.g., *bent*).

- (33) Context: There are two fishing rods, A and B. Both of them are bent, but A is more bent than B.
a. A is more bent than B (Explicit comparison)
b. ??Compared to B, A is bent. (Implicit comparison)

The availability of differentials: only comparatives of explicit comparison can introduce differentials.

- (34) Context: John is 170cm; Mary is 168cm.
a. John is 2 cm taller than Mary. (Explicit comparison)
b. *Compared to Mary, John is 2 cm tall. (Implicit comparison)

Negative implicatures to the positive form: Kennedy (2007) and Sawada (2009) observe that a comparative like (31b) carries a negative implicature for the subject, that is, John is not really tall. In a context like (35) where John is really tall, (31b) is infelicitous.

- (35) Context: John is 6 feet. Mary is 5 feet 2.
- a. John is very tall. He is taller than Mary. (Explicit comparison)
- b. ??John is very tall. John is tall compared to Mary. (Implicit comparison)

If we apply the above four tests to the two comparatives in (7) and (26), we find that (7) and (26) do not pattern with explicit and implicit comparison in most of the tests except for the one on the availability of differentials.

Crisp judgment contexts: Our informants report that both (7) and (26) are felicitous in crisp judgement contexts like (36).

- (36) Context: Ayi is 170cm; Aguo is 169cm.
- a. a³³z̄i⁵⁵ a⁵⁵kɔ³³ tɕo³⁴ a²¹tshɿ³³ mu³³ a³⁴z̄ɿ³³. [PA]
 Ayi Aguo toward exceed ADVL tall
 ‘Ayi is taller than Aguo.’
- b. a³³z̄i⁵⁵ a⁵⁵kɔ³³ z̄ɿ²¹ a²¹tshɿ³³. [EA]
 Ayi Aguo as tall as exceed
 ‘Ayi is taller than Aguo.’

Adjectives with minimum standards: In Nuosu Yi, adjectives with minimum standards are PAs that do not have an EA counterpart. Therefore, this test is not applicable to the two comparatives in Nuosu Yi.

- (37) Context: There are two fishing rods, A and B. A is more bent than B.
- a. A B tɕo³⁴ a²¹tshɿ³³ mu³³ la²¹gu⁵⁵. [PA]
 A B toward exceed ADVL bent
 ‘A is more bent than B’
- b. *A B la²¹gu⁵⁵ a²¹tshɿ³³. [EA]
 A B bent exceed

The availability of differentials: Only (7) is compatible with differential measure phrases.

- (38) Context: Ayi is 170cm; Aguo is 168cm.
- a. *a³³z̄i⁵⁵ n̄i²¹kɔ³³vɛ³³ a⁵⁵kɔ³³ tɕo³⁴ a²¹tshɿ³³ mu³³ a³⁴z̄ɿ³³. [PA]
 Ayi 2 cm Aguo towards exceed ADVL tall
- b. a³³z̄i⁵⁵ n̄i²¹kɔ³³vɛ³³ a⁵⁵kɔ³³ z̄ɿ²¹ a²¹tshɿ³³. [EA]
 Ayi 2 cm Aguo as tall as exceed
 ‘Ayi is 2cm taller than Aguo.’

Negative implicatures to the positive form: (7) and (24) do not imply that Ayi is tall.

- (39) Context: Ayi is 152cm; Aguo is 150cm.
- a. a³³z̄i⁵⁵ a³⁴-a²¹-z̄ɿ³³. a³³z̄i⁵⁵ a⁵⁵kɔ³³ tɕo³⁴ a²¹tshɿ³³ mu³³ a³⁴z̄ɿ³³.
 AYI TALL-NEG-TALL. Ayi Aguo toward exceed ADVL tall
 ‘Ayi is not tall. Ayi is taller than Aguo.’
- b. a³³z̄i⁵⁵ a³⁴-a²¹-z̄ɿ³³. a³³z̄i⁵⁵ a⁵⁵kɔ³³ z̄ɿ²¹ a²¹tshɿ³³.

Ayi tall-Neg-tall. Ayi Aguo as tall as exceed
 ‘Ayi is not tall. Ayi is taller than Aguo.’

Neither do they imply that Ayi is not tall.

(40) Context: Ayi is 180 cm; Aguo is 150cm.

- a. a³³zɿ⁵⁵ a³⁴zɿ³³-dzɿ³³- a³⁴zɿ³³. a³³zɿ⁵⁵ a⁵⁵kɔ³³ tɕo³⁴ a²¹tshɿ³³ mu³³ a³⁴zɿ³³.
 Ayi tall-very-tall Ayi Aguo toward exceed ADVL tall
 ‘Ayi is very tall. Ayi is taller than Aguo.’
- b. a³³zɿ⁵⁵ a³⁴zɿ³³-dzɿ³³- a³⁴zɿ³³. a³³zɿ⁵⁵ a⁵⁵kɔ³³ zɿ²¹ a²¹tshɿ³³.
 Ayi tall-very-tall Ayi Aguo as tall as exceed
 ‘Ayi is very tall. Ayi is taller than Aguo.’

The discussion above shows that except for the test on the availability of differentials, there is no other evidence indicating that the two comparisons in Nuosu Yi fall into the distinction between the explicit and implicit comparison. In the following section, we propose that the non-availability of differentials in the comparative in (7) and the absence of the interrogative reading in the exclamative in (16) are due to the non-degree-based semantics of PAs.

4. Analysis

Our main proposal is that PAs and EAs are semantically distinct: PAs are vague predicates of type $\langle e, t \rangle$, and EAs are degree predicates of type $\langle d, \langle e, t \rangle \rangle$.⁵ This analysis makes reference to two main approaches to the semantics of adjectives in the literature, namely, the inherent vagueness approach and the degree-based approach. In section 4.1 we briefly review these two approaches; in section 4.2, we show that analyzing PAs and EAs along these two approaches can explain their distributions in gradation structures.

4.1 Two approaches: the degree-based and the inherent vagueness approaches

Based on different ontological assumptions, there are two main approaches to the semantics of gradable adjectives. The degree-based approach, which is considered as the standard approach to the semantics of gradable adjectives, starts with the assumption that gradable adjectives (e.g., *tall*) are semantically different from non-gradable predicates (e.g., *run*). The former contain a degree argument and denote a relation between individuals and degrees (of type $\langle d, \langle e, t \rangle \rangle$) (Seuren 1973, Cresswell 1976, von Stechow 1984, Heim 2000, a.o.).

- (41) a. $[[tall]] = \lambda d \lambda x. x$ is at least tall to d . $\langle d, et \rangle$
 b. $[[run]] = \lambda x. x$ runs. $\langle e, t \rangle$

Degree morphology functions to modify or quantify over the degree argument of gradable adjectives. For example, it is assumed that the comparative *John is taller than Mary* has the LF in (42a) where the comparative marker *-er* quantifies over the degree argument of the adjective

⁵ In this paper we make use of the following semantic types: type e for individuals; type t for truth-conditions, type d for degrees; type c for contexts.

tall and specifies that there is some degree d to which John is tall but Mary is not, as shown in (42b).

- (42) a. The LF of *John is taller than Mary*: $[-er \text{ than Mary is } d_2\text{-tall}]_1[\text{John is } d_1\text{-tall}]$
 b. $[[\text{John is taller than Mary}]] = \exists d[\text{tall}(d)(\text{John}) \wedge \neg \text{tall}(d)(\text{Mary})]$

In this analysis, measure phrases are analyzed as degree expressions: they are either names of degrees (of type d) (von Stechow 1984) or degree quantifiers (of type $\langle\langle d, t \rangle, t \rangle$) (Schwarzschild 2005). For example, in (43a) the measure phrase *2 cm* is analyzed as a predicate of sets of degrees that span 2 cm on a scale; in (43b) this measure phrase is used as a differential that predicates of the difference between John’s height and Mary’s height

- (43) a. $[[2 \text{ cm}]] = \lambda D_{\langle d, t \rangle} 2\text{cm}(D)$
 b. $[[\text{John is } 2 \text{ cm taller than Mary}]] = 2 \text{ cm}(\lambda d. [\text{tall}(d)(\text{John}) \wedge \neg \text{tall}(d)(\text{Mary})])$

In contrast to the degree-based approach, the inherent vagueness approach (McConnell-Ginet 1973; Kamp 1975; Klein 1980, 1982; van Rooij 2011; a.o.) assumes that gradable adjectives (e.g., *tall*) have the same semantics as non-gradable predicates (e.g., *run*): they are predicates of type $\langle e, t \rangle$.

- (44) a. $[[\text{tall}]]^c = \lambda x. x \text{ is tall in } c$ $\langle e, t \rangle$
 b. $[[\text{run}]] = \lambda x. \text{run}(x)$ $\langle e, t \rangle$

The difference between gradable adjectives and non-gradable verbs lies in that the domain of the former is inherently ordered according to some gradable property. A gradable adjective φ in a context c denotes a function that induces a tripartite structure onto its domain: (i) a positive extension, which contain objects that are φ in c ; (ii) a negative extension, which contain objects that are not φ in c ; and (iii) an extension gap, which contain objects that are in the borderline cases (i.e., objects for which it is not clear whether they are φ or not φ), as shown in (45).

- (45) a. $[[\varphi(x)]]^c = 1$ iff x is in the positive extension of φ .
 b. $[[\varphi(x)]]^c = 0$ iff x is in the negative extension of φ .
 c. $[[\varphi(x)]]^c$ is undefined if x is in the extension gap of φ .

To illustrate (45), suppose that the universe includes four individuals—Chris, John, Steve and Bill, whose heights are given in (46). Chris and John are normally considered tall, thus they fall into the positive extension of tall. Bill is not tall, thus he is in the negative extension. Steve is either tall or not tall, and he is in the extension gap, as illustrated by the diagram in (46).

- (46) Chris 6’2” John 6’ Steve 5’8” Bill 4’

	+	GAP	-
Chris	John	Steve	Bill

Note that whether an individual falls into the positive extension, the negative extension, or the extension gap of *tall* depends on whom we compare the individual with (i.e., comparison classes). If we compare John to average people, he is tall, but if we compare John to NBA basketball players (whose average height is 6'7"), then John is *not* tall. This information about the comparison class is supplied by the context.

On the inherent vagueness approach, degree morphology modifies or quantifies over the contextual parameter.⁶ For example, the comparative *John is taller than Mary* has the semantics in (47), which says there is a context c' with respect to which John counts as tall, but Mary does not. By the Consistency Constraints,⁷ which ensures the inherent order on the domain of the adjective is always respected (i.e., if there is a context where John is tall and Bill is not, then there can be no contexts where Bill is tall and John is not), (47) entails that John exceeds Mary in height in all contexts.⁸

$$(47) \quad [[\textit{John is taller than Mary}]]^c = \exists c' [[\textit{tall}]]^{c'}(\textit{John}) \wedge \neg [[\textit{tall}]]^{c'}(\textit{Mary})$$

Compared to the degree-based approach, the inherent vagueness approach does not have a good analysis of measure phrases.⁹ Measure phrases are analyzed as predicates of contexts as shown in (48), which is by no means intuitive.

$$(48) \quad [[\textit{John is 2 cm taller than Mary}]]^c = 2 \text{ cm}(\lambda c' [[\textit{tall}]](c'))(\textit{John}) \wedge \neg [[\textit{tall}]](c')(\textit{Mary})$$

In the paper, we follow the degree-based approach in assuming that measure phrases are degree expressions, which are only licensed in gradation structures whose semantics are degree-based. With this assumption in mind, we can now turn to our first question: why is it the case that EAs are only allowed in gradation structures associated with measure phrases (i.e., differential comparatives and degree questions)?

4.2 The Complementary Distribution of PAs and EAs

We propose that EAs have a degree-based semantics but PAs do not, as shown in (49).

- (49) a. $[[z_1^{21}]] = \lambda d \lambda x. x \text{ is (at least) tall to } d.$ [EA]
 b. $[[a^{34}z_1^{33}]]^c = \lambda x. x \text{ counts as tall in } c = \lambda x. \text{tall}_c(x)$ [PA]

In (49a), the EA denotes a relation between individuals and degrees, and the PA is a vague predicate that denotes a property of individuals. These two interpretations predict that the

⁶ In order for the comparative marker to access the context parameter, the gradable adjective needs to undergo a type shifting operation from type $\langle e, t \rangle$ to type $\langle c, \langle e, t \rangle \rangle$ (see 52).

⁷ According to Kennedy (2011:75), the two consistency constraints are:

- (a) For any positive form gradable predicate g and objects in its domain x, y and for any context c , if $g(x)(c)$ is true and $g(y)(c)$ is false, then x exceeds y relative to the scalar concept encoded by g .
 (b) For any positive form gradable predicate g and objects in its domain x, y , if there is a context c such that $g(x)(c)$ is true and $g(y)(c)$ is false, then for any c' such that $g(y)(c')$ is true, $g(x)(c')$ is also true.

⁸ Kennedy (2011) points out that the inherent vagueness approach cannot capture the distinction between explicit and implicit comparison. van Rooij (2011) argues for a different view. We remain agnostic on this issue.

⁹ See von Stechow (1984) for detailed criticism along these lines.

gradation structures for the EA are degree-based, and those for the PA are not. Below let us look at the details.

Given the semantics of $a^{34}z\eta^{33}$ in (49b), its comparative has the semantics in (50).

- (7) $a^{33}zi^{55}$ $a^{55}ko^{33}$ $t\phi o^{34}$ $a^{21}tsh\eta^{33}$ mu^{33} $a^{34}z\eta^{33}$.
 Ayi Aguo toward exceed ADVL tall
 ‘Ayi is taller than Aguo.’

- (50) $[[(7)]] = \exists c' [[tall]]^{c'}(\text{John}) \wedge \neg [[tall]]^{c'}(\text{Mary})$

To achieve the truth-conditions in (50) compositionally, several assumptions need to be made. First, we assume that $a^{21}tsh\eta^{33}$ ‘to exceed’ is a comparative marker that has the semantics in (51). It takes three arguments, which in sequence are: (i) an individual argument denoted by the standard of comparison; (ii) a relation between contexts and individuals; and (iii) an individual argument denoted by the subject.

- (51) $[[exceed]]^c = \lambda y_e \lambda P_{\langle c, \langle e, t \rangle \rangle} \lambda x_e. \exists c' [P(c')(x) \wedge \neg P(c')(y)]$

Given that $a^{21}tsh\eta^{33}$ in (51) needs to access the context parameter of the adjective, we assume that there is a type shifting rule that shifts the type of the adjective from $\langle e, t \rangle$ to $\langle c, \langle e, t \rangle \rangle$, as shown in (52).

- (52) Context-Accessing Functional Application
 If a branching node α has as its daughters β and γ , and $[[\beta]]^c$ is of type $\langle c, \dots \rangle$ and $[[\gamma]]^c$ is of type $\langle \dots \rangle$, then $[[\alpha]]^c = [[\beta]]^c(\lambda c'. [[\gamma]]^c)$
 (Morzcki 2013:109)

Moreover, we assume that the preposition $t\phi o^{34}$ ‘toward’ and the adverbializer mu^{33} are both semantically vacuous. The compositional semantics of (7) can be spelled out as follows:

- (53) $[[Ayi \text{ Aguo } toward \text{ exceed } ADVL \text{ tall}]]^c = [[exceed]]^c([[Aguo]]^c)(\lambda c'. [[a^{34}z\eta^{33}]]^c)([[Ayi]]^c)$
 $= \exists c' [tall_{c'}(Ayi) \wedge \neg tall_{c'}(Aguo)]$

Let us now turn to the comparative in (26) which involves the EA $z\eta^{21}$. Given the semantics of $z\eta^{21}$ in (49a), (26) has the truth-conditions in (54).

- (26) $a^{33}zi^{55}$ $a^{55}ko^{33}$ $z\eta^{21}$ $a^{21}tsh\eta^{33}$.
 Ayi Aguo as tall as exceed
 ‘Ayi is taller than Aguo.’

- (54) $[[(26)]] = \exists d [tall(d)(Ayi) \wedge \neg tall(d)(Aguo)]$

We assume that $a^{21}tsh\eta^{33}$ ‘to exceed’ in (26) has a different semantics from it is in (7). It is now a degree quantifier which takes three arguments: (i) a degree function denoted by the adjacent EA; (ii) an individual argument denoted by the standard of comparison; and (iii) an individual argument denoted by the subject (or the target of comparison), as shown in (55).

$$(55) \quad [[exceed]]^c = \lambda P_{\langle d, \langle e, t \rangle \rangle} \lambda y_e \lambda x_e. \exists d [P(d)(x) \wedge \neg P(d)(y)]$$

Assuming that measure phrases are predicates of sets of degrees (Schwarzschild 2005), it follows that differential measure phrases are only allowed in (27)(repeated below) but not in (7), because only the former has a degree-based semantics.

$$(27) \quad a^{33} \text{ } \text{zi}^{55} \quad \text{ni}^{21} \text{ko}^{33} \text{ve}^{33} \quad a^{55} \text{ } \text{ko}^{33} \quad \text{zi}^{21} \quad a^{21} \text{ } \text{tsh}\eta^{33}.$$

Ayi 2 cm Aguo as tall as exceed
‘Ayi is 2cm taller than Aguo.’

The truth-conditions of (27) are captured by (56b), which says: the set of degrees to which Ayi is tall but Aguo is not extends 2 cm on a scale of height.

$$(56) \quad \text{a. } [[exceed]]^c = \lambda P_{\langle d, \langle e, t \rangle \rangle} \lambda y_e \lambda D_{\langle \langle d, t \rangle, t \rangle} \lambda x_e. D(\lambda d [P(d)(x) \wedge \neg P(d)(y)])$$

$$\text{b. } [[(27)]]^c = 2\text{cm}(\lambda d [\text{tall}(d)(\text{Ayi}) \wedge \neg \text{tall}(d)(\text{Aguo})])$$

Turning to the two exclamatives in (16) and (29)(repeated below), only the exclamative in (29) that involves the EA zi^{21} can be interpreted as a degree question, while (16) cannot.

$$(16) \quad a^{33} \text{ } \text{zi}^{55} \quad \text{khu}^{21} \quad \text{mu}^{33} \quad \text{ndza}^{55}. \quad [\text{PA}]$$

Ayi how ADVL prett
*‘How pretty is Ayi?’ (*Degree question)
‘How pretty Ayi is!’ (Exclamative)

$$(29) \quad a^{33} \text{ } \text{zi}^{55} \quad (\text{ko}^{21} \text{po}^{33}) \quad \text{khu}^{21} \quad \text{zi}^{34}. \quad [\text{EA}]$$

Ayi body how as tall as
(i) ‘How tall is Ayi?’ (Degree question)
(ii) ‘How tall Ayi is!’ (Exclamative)

The question then is: why is it the case that (16) cannot receive an interrogative reading? The answer to this question lies in whether the semantics of the degree question is compatible with the semantics of measure phrases. We follow Karttunen (1977) in assuming that a question denotes a set of propositions which are its true possible answers. On the degree-based approach, the degree question ‘*how tall is Ayi?*’ denotes a set of propositions that Ayi is at least tall to d in the evaluation world w , as shown in (57). For instance, if Ayi is 5 feet 4 in w , (57) denotes a set of propositions like the following: $\{\lambda w. \text{Ayi is 5 feet 4 in } w, \lambda w. \text{Ayi is 5 feet 3 in } w, \lambda w. \text{Ayi is 5 feet 2 in } w \dots\}$.

$$(57) \quad [[\text{How tall is Ayi?}]]^w = \lambda p_{\langle s, t \rangle} \exists d [p(w) \wedge p = \lambda w'. \text{Ayi is at least tall to } d \text{ in } w']$$

On the inherent vagueness approach, the question ‘*how tall is Ayi?*’ has a different semantics as

in (58). It denotes a set of propositions true of the evaluation world w where there is a comparison class/context c relative to which Ayi counts as tall.

$$(58) \quad [[\textit{How tall is Ayi?}]]^w = \lambda p_{\langle s, t \rangle} \exists c [p(w) \wedge p = \lambda w'. \text{Ayi is tall in } c \text{ in } w']$$

If measure phrases are degree expressions, (57) and (58) differ in whether they allow measure phrases as possible answers: (57) does but (58) does not.

Here we make another important assumption: in Nuosu Yi if a degree question cannot take a measure phrase as its possible answer, then it is infelicitous to be interpreted as a question. Dimensional adjectives (e.g., *tall*) are associated with conventionalized scales. It is easy to see why their degree questions target measure phrases as answers (e.g., *How tall is Ayi? 5 feet 4*). Quality adjectives (e.g., *pretty*) are associated with non-dimensional concepts, most of which do not come with a conventionalized scale. We assume that their questions also target measure phrase as answers. This assumption is based on two observations. Firstly, degree questions with quality adjectives like ‘how pretty is Ayi?’ are usually hard to answer. To answer this type of question, people resort to a point scale or a percentile system. So answers like ‘80 points’ or ‘80 percent’ are very common. Moreover, in contexts where there is an explicit scale available for measuring a non-dimensional scalar concept, its degree questions must be answered with measure phrases just like questions with dimensional adjectives.

- (59) Context: In a beauty contest where contestants are given score ranging from 1 to 10 stars, Ayi got 7 stars.
- a. How pretty is Ayi?
 - b. 7 stars.

Therefore, our answer for why (16) cannot receive an interrogative reading is that its semantics is incompatible with measure phrases.

However, (16) can be interpreted as an exclamative. This is because the semantics of exclamatives do not have to be associated with measure phrases. Rett (2012) argues that exclamatives express a violation of the speaker’s expectation. Her analysis is compatible with both the degree-based approach and the inherent vagueness approach, as shown below.

- (60) The degree-based approach
- a. $[[\textit{How tall Ayi is!}]] = \text{Ayi is tall to } d$, which violates the speaker’s expectation.
- The inherent-based approach
- b. $[[\textit{How tall Ayi is!}]]^c = \text{Ayi is tall in } c$, which violates the speaker’s expectation.

The formula in (60a) says that Ayi is tall to some degree d , which exceeds the speaker’s expectation. The formula in (60b) says: Ayi counts tall in the evaluation context c , which exceeds the speaker’s expectation.

To summarize, in this section we propose that PAs and EAs are semantically distinct. EAs have a degree-based semantics but PAs do not. This semantic distinction determines the distributions of PAs and EAs in gradation structures. Assuming that measure phrases are degree expressions and they are only admissible in gradation structures whose semantics are degree-based, it follows that only gradation structures of EAs—differential comparatives and degree questions—are compatible with measure phrases.

In the following section, we look at the cross-categorial nature of degree morphology in Nuosu Yi, that is, degree modifiers can modify gradable adjectives and non-gradable predicates alike. We show that unlike ‘degree modifiers’ in English that quantify over the degree argument of gradable adjectives, ‘degree’ modifiers in Nuosu Yi operate on either the event argument of non-gradable predicates or the contextual parameter of the gradable/non-gradable predicates.

5. The cross-categorial nature of ‘degree’ modifiers in Nuosu Yi

‘Degree’ modifiers in Nuosu Yi can be classified into two groups: those marked by the adverbializer *mu*³³ and those that are not. The former include the adverbial [*Y tɕo*³⁴ *a*²¹*tshɿ*³³ *mu*³³] in the comparative (e.g., 7), *dʒɿ*³³ *su*³⁴ *mu*³³ in the equative construction (e.g., 14) and the exclamative marker *khur*²¹ *mu*³³ (e.g., 16); the latter include the intensification marker *-dʒɿ*³³ (e.g., 18), the excessive marker *kɔ*³³ (e.g., 21) and the superlative marker *sa*⁵⁵ (e.g., 23). Both groups modify gradable and non-gradable predicates. In this section, we consider the semantics of ‘degree’ modifiers in these constructions and show that they operate on either the event argument of non-gradable predicates or the contextual parameter of the gradable/non-gradable predicates.

***mu*³³-adverbials.** *mu*³³-adverbials appear in front of both gradable adjectives and non-gradable verbs, as shown in (7) and (10)(repeated below).

- (7) *a*³³*ʒi*⁵⁵ [*a*⁵⁵*kɔ*³³ *tɕo*³⁴ *a*²¹*tshɿ*³³ *mu*³³] *a*³⁴*ʒɿ*³³.
 Ayi Aguo toward exceed ADVL tall
 ‘Ayi is taller than Aguo.’
- (10) *a*³³*ʒi*⁵⁵ *li*³³ *dʒo*²¹ *dʒi*³³ *mu*³³ *do*²¹ *hi*²¹.
 Ayi TOP natural ADVL words speak
 ‘Ayi speaks naturally.’

Given our analysis of the comparative in section 4.2, we propose that when a *mu*³³-adverbial precedes a gradable adjective, it quantifies over the contextual parameter of the gradable adjective as in (61); when it precedes a non-gradable predicate, it modifies the event argument of the verb, as in (62).

$$(61) \quad [[\text{Aguo toward exceed ADVL}]]^c = \lambda P_{\langle e, \langle c, t \rangle \rangle} \lambda x_e \exists c' [\text{tall}(c')(x) \wedge \neg \text{tall}(c')(Aguo)]$$

$$(62) \quad [[\text{natural ADVL}]] = \lambda P_{\langle e, \langle v, t \rangle \rangle} \lambda x_e \lambda e_v [P(x)(e) \wedge \text{natural}(e)]$$

Below let us proceed to the ‘degree’ modifiers that are not marked by *mu*³³.

The superlative marker the superlative construction involves the exhaustive particle *sa*⁵⁵. *sa*⁵⁵ can combine with either gradable adjective like *phu*³³ *dʒo*³³ ‘expensive’ in (23) or non-gradable verbs like *hur*²¹ ‘to read’ or *dʒur*³³ ‘to eat’ in (24) to give rise to a variety of meanings. When *sa*⁵⁵

combines with a gradable adjective, the sentence receives a superlative interpretation like ‘most’. When *sa*⁵⁵ combines with a non-gradable verb, the sentence receives a universal interpretation (e.g., 24a) or a completive interpretation (24b).

- (23) i³³ti³⁴ a³³dzi³⁴ gu³³ phu³³ dzo³³ sa⁵⁵
 clothing that CL expensive EXH
 ‘That garment is the most expensive.’
- (24) a. tsho³³ hi⁵⁵ zɔ⁵⁵ su³³ dzi³³ku³⁴ thu²¹zi³³ hu²¹ sa⁵⁵.
 people 8 CL-DET together book read EXH
 ‘The eight people are all reading books.’ (Gerner 2013:13)
- b. a³³ zi⁵⁵ sɿ²¹mi³³ tshi³³ ma³³ dʒu³³ sa⁵⁵ o³⁴.
 Ayi nut 10 CL eat EXH SFP
 ‘Ayi completely ate up ten nuts.’ (Gerner 2007:52)

Gerner (2007), in an attempt to provide a unified semantics for *sa*⁵⁵, argues that it is a universal quantifier of objects, events and contexts.¹⁰ In (24a) *sa*⁵⁵ quantifies over objects—it denotes a proper subset relation between two sets of objects denoted by the NP (i.e., *the eight people*) and the VP (i.e., *read books*). (24a) can be interpreted in a similar way to the English sentence *all the eight people are reading books*. In (24b), *sa*⁵⁵ quantifies over events. It denotes a proper subset relation between the set of events eating ten nuts and the set of events whose agent is Ayi. (24b) means: every event of eating ten nuts is an event done by Ayi, thus yielding the completive interpretation. When *sa*⁵⁵ combines with the gradable adjective in (23), it quantifies over comparison classes.¹¹ It indicates that that garment counts as expensive with respect to any comparison class, hence yielding the superlative reading.

The intensification marker. The intensification construction in Nuosu Yi is marked by the infix *-dzi*³³. Like the exhaustion particle *sa*⁵⁵, *-dzi*³³ can modify gradable adjectives (e.g., 18) and non-gradable verbs or nouns (e.g., 19-20).

- (18) a³³ zi⁵⁵ a³⁴ zi³³ -dzi³³- a³⁴ zi³³
 Ayi tall-very-tall
 ‘Ayi is very tall.’
- (19) a³³ zi⁵⁵ ŋo³³-dzi³³- ŋo³³.
 Ayi cry-very-cry
 ‘Ayi is crying bitterly.’ (Gerner 2013: 450)

¹⁰ Gerner (2007)’s analysis is more complicated than being presented here. He also discusses different domain types of objects, events and states, which is not directly relevant to our discussion here.

¹¹ Gerner opts for a non-degree based analysis of the adjective in Nuosu Yi, as he argues: from the perspective of this paper, the degree approach is also unattractive, because there is no obvious way to define the reference type of states in relation to the position or range of degrees they have on a scale of degrees.” (Gerner 2007:42)

- (20) tshŋ²¹ khu³³ a³³ dzŋ³⁴ ma³³ khu³³-dzŋ³³- khu³³ ma³³ ŋu³³.
his dog this CL dog-very-dog CL COP
His dog is a real dog.

(Gerner 2013: 450)

Here we refer to Beltrama and Bochnak (2015)’s analysis on the semantics of the cross-categorial intensifiers *issimo* in Italian and *šèmu* in Washo. Both of these intensifiers are similar to the infix *-dzŋ³³* in Nuosu Yi in that they modify both gradable and non-gradable predicates.

Beltrama and Bochnak (2015:861) argue that cross-categorial intensifiers like *issimo* and *šèmu* universally quantify over the contextual parameter of gradable and non-gradable predicates. For gradable adjectives, the relevant contextual parameter is the relevant comparison class to derive the standard; for non-gradable predicates, the relevant parameter is the amount of “pragmatic slack” allowed by the context (Lasersohn 1999). They propose that the two intensifiers have the semantics in (63).¹²

$$(63) \quad [[\text{mod}]]^{\text{w, g, c}} = \lambda P_c \lambda x \forall c' [c' R c \rightarrow P(x) \text{ in } c']$$

In (63) P_c can be either gradable or non-gradable predicates. R is a relation that holds between c and c' such that c' is just like c except for the values they assign to the relevant contextual parameter that affects the interpretation of P_c .

If we extend Beltrama and Bochnak’s analysis to the intensification marker *-dzŋ³³* in Nuosu Yi, (18) means: Ayi count as tall not only in the current utterance context but also in contexts where a higher standard is introduced (e.g., basketball players). (19) means: Ayi is considered as crying even under the most stringent context for what crying is.

The excessive marker the excessive construction in Nuosu Yi is marked by *kɔ³³*, which modifies gradable and non-gradable predicates, as shown in (21) and (22)(repeated below).

- (21) a³³ zŋ⁵⁵ a³⁴ zŋ³³ kɔ³³.
Ayi tall too
‘Ayi is too tall.’

- (22) tshŋ³³ ndzŋ³³ ndo³³ kɔ³³.
he wine drink too
‘He drinks too much wine.’

We can model the meaning of *kɔ³³* after that of *too* in English with an adaptation to contexts and events. Let us consider the meaning of *too* first. According to the standard degree-based analyses (von Stechow, 1984; Heim 2000; Meier, 2003), *too* is a degree expression that compares the actual degree to a modalized one. For instance, the sentence ‘*Ayi is too tall*’ describes a comparison between the degree to which Ayi is tall to the degree to which Ayi would have been

¹² The reader might note that both the intensification marker and the superlative marker involve a universal quantifier. Bochnak (p.c.) suggests that semantics in (63) does not necessarily give rise to a superlative interpretation because the relation R functions to restrict the domain of the universal quantifier so that the c' does not necessarily include all the comparison classes available. For example, it is possible for R to restrict c' to include only comparison classes that the speaker is interested in.

tall if she had met the requirement (e.g., in order to join a gymnastic team, Ayi has to be under 5 feet 4. However, Ayi is 5 feet 6).

In our analysis, we propose that $k\text{ɔ}^{33}$ in (21) denotes a proper subset relation between two sets of contexts (comparison classes)—the set of contexts relative to which Ayi counts as tall and the set of contexts relative to which Ayi would count as tall had she met the relevant requirement. That is, for any two objects A and B, if A is taller than B, that means there are more contexts relative to which A is tall than those relative to which B is tall.

When $k\text{ɔ}^{33}$ modifies a non-gradable verb like in (22), $k\text{ɔ}^{33}$ denotes a proper subset relation between two sets of events—the set of drinking events that has been done in the actual world and the set of drinking events that would have been done had the relevant requirement been met (e.g., the requirement is for everyone to drink no more than one bottle; but the subject drank 3 bottles). The former is a superset that contains the latter.

To summarize, in this section we have looked at the semantics of the ‘degree modifiers’ in Nuosu Yi. Unlike those in English which select for gradable adjectives, degree modifiers in Nuosu Yi modify both gradable and non-gradable predicates. We attribute this distinction to different semantics of modifiers: in English, degree modifiers quantify over degree argument of gradable adjectives; in Nuosu Yi, degree modifiers operate on either the event argument of non-gradable predicates or the contextual parameter of the gradable/non-gradable predicates.

5. A decompositional analysis of PAs and EAs

So far we have not talked about the semantic relation between PAs and EAs. Their morphological similarity hints at a possible semantic connection between them. The goal of this section is to explore a decompositional analysis to spell out the possible semantic connection between PAs and EAs.

Kennedy (1997) argues for an alternative degree-based semantics for gradable adjectives, in which gradable adjectives do not introduce a degree argument (compare with 64a) but denote a measure function from individuals to degrees (e.g., 64b).

- (64) a. $[[tall]] = \lambda d \lambda x. x$ is at least tall to d . <d, et>
 b. $[[tall]] = \lambda x. x$'s height <e, d>

Given its semantics, gradable adjectives must combine with some degree morphology to become a predicate of individuals. Take the sentence *Ayi is tall* for example. It is assumed that there is null degree morpheme POS, which composes with the rest of the sentence and yields the truth-conditions in (65b)—Ayi is at least as tall as some contextually supplied standard d_c .

- (65) LF of *Ayi is tall*: Ayi is POS tall.
 a. $[[POS]]^c = \lambda P_{\langle e, d \rangle} \lambda x. P(x) \geq d_c$
 b. $[[Ayi POS tall]]^c = \text{Ayi's height} \geq d_c$

As the table A shows, PAs and EAs share the same stem (e.g., the PA $a^{34}\text{ɳ}^{33}$ ‘tall’ and the EA ɳ^{21} share the same stem of ɳ^{33}). One possibility would be that this stem denotes a measure function like the one in (64b). It has to combine with the prefix a^{33} - (or a^{34} -) to become a PA; or it combines with a 21 tone to become an EA. In the former case, the prefix is semantically

parallel to POS in (65), whose function is to specify that the value of x exceeds some contextually supplied variable d_s , as shown in (66).

$$(66) \quad \text{PA: } [[a^{34}z\gamma^{33}]]^c = \lambda x. x\text{'s height} \geq d_s$$

$$[[a^{34}]]^c = \lambda P_{\langle e, d \rangle} \lambda x. P(x) \geq d_s \quad [[z\gamma^{33}]] = \lambda x. x\text{'s height}$$

In the latter case, the 21 tone in EAs is semantically parallel to MEAS in Svenonius and Kennedy (2006): MEAS introduces a degree argument for adjectives by turning them from a measure function into a relation, as shown in (67).

$$(67) \quad \text{EA: } [[z\gamma^{21}]] = \lambda d \lambda x. \text{tall}(x) \geq d$$

$$[[z\gamma^{33}]] = \lambda x. x\text{'s height} \quad [[21 \text{ tone}]] = \lambda P_{\langle e, d \rangle} \lambda d \lambda x. P(x) \geq d$$

Svenonius and Kennedy (2006) observe that dimensional adjectives in Northern Norwegian show some special properties that non-dimensional adjectives do not have: they can combine with measure phrases, and can form a particular type of null degree question. Svenonius and Kennedy attribute these properties to the presence of MEAS, a null degree head that lexically selects for dimensional adjectives and introduces a semantic or a syntactic degree argument for them. More recently, Grano and Kennedy (2011) argue that MEAS can also be used to explain a type of comparative construction in Mandarin—‘transitive’ comparatives—which is only available to dimensional adjectives. We take these studies as suggestive that the presence of MEAS is cross-linguistically pervasive, and in Nuosu Yi it is realized as a [21] tone in EAs.

6. A comparison with Navajo and Russian

It has been shown by various cross-linguistic studies that dimensional adjectives can show peculiar behaviors distinct from non-dimensional adjectives (i.e., Svenonius and Kennedy (2006) on Northern Norwegian; Bogal-Allbritten (2008, 2013) on Navajo; Krasikova (2009) on Russian; Schwarzschild (2010) on Hebrew; Grano and Kennedy (2011) on Mandarin Chinese). In this section, we compare Nuosu Yi to Navajo and Russian, and show that although dimensional adjectives in these languages show similar patterns, there are crucial distinctions among them that motivate different semantic analyses.

In Navajo, dimensional adjectives can bear two different aspect markers—an absolute aspect (AA) and a comparative aspect (CA). AA-marked and CA-marked adjectives can be modified by the same set of degree phrases, but the syntax of degree phrases differ. Degree phrases that modify AA-marked adjectives must appear in a subordinate form, that is, they have to be followed by the copula *át’ée* ‘he/she/it is’ and the copula is then marked by the subordinator = *go*, glossed SUB, as shown in (68a). Degree phrases that modify CA-marked adjectives do not need to appear in the subordinate form, as shown in (68b) and (68c).

$$(68) \quad \text{a.} \quad \text{shimá} \quad [\text{shí} = \text{gi} \text{ ‘át’ée} = \text{go}] \quad \text{nizhóní} \quad \text{absolute aspect}$$

$$\text{my.mother} \quad \text{me} = \text{at} \quad 3\text{SUBJ.be} = \text{SUB} \quad 3\text{SUBJ.pretty}_{\text{AA}}$$

- ‘My mother is as pretty as I am.’
- b. *shimá [shí = gi ‘át’ée = go] ‘áníñééz comparative aspect
 my.mother me = at 3SUBJ.be = SUB 3SUBJ.tall_{CA}
- c. shimá [shí = gi] ‘áníñééz comparative aspect
 my.mother me = at 3SUBJ.tall_{CA}
 ‘My mother is as tall as I am.’

Bogal-Allbritten (2013) argues that AA-marked and CA-marked adjectives are semantically identical; they are predicates of type $\langle d, \langle e, t \rangle \rangle$. Their difference in gradation structures like (68) is due to whether they can introduce a degree argument in syntax. CA-marked adjectives introduce a degree argument, and allow degree phrases to directly combine with them; AA-marked adjectives do not introduce a degree argument, and thus require degree phrases to appear in a subordinate clause.

Comparing Nuosu Yi to Navajo, the two languages are similar in at least two aspects. Firstly, in both languages, dimensional adjectives have different morphological variants: in Nuosu Yi, dimensional adjectives fall into two groups—Positive adjectives (PAs) and Equative adjectives (EAs); in Navajo, dimensional adjectives are classified into CA-marked and AA-marked adjectives. Secondly, both groups of adjectives are allowed in gradation structures but these structures have different syntax. In Nuosu Yi, degree phrase for PAs (e.g., the comparative marker) have to be introduced in an adverbial clause marked by the adverbializer *mu*³³ similar to the subordinator = *go* in Navajo.

Despite the similarities, dimensional adjectives in these two languages also differ in important aspects. Firstly, in Navajo AA-marked and CA-marked adjectives do not differ in distribution in gradation structures—they can be modified by the same set of degree phrases. In Nuosu Yi, however, PAs and EAs have different distributions—PAs are only admissible in differential comparatives and degree questions/exclamatives. Secondly, unlike in Navajo, there is no systematic syntactic distinction between degree modifiers for PAs and EAs. Not all degree phrases for PAs in Nuosu Yi are marked by the adverbializer (e.g., the excessive marker, the intensification marker, etc.). The first difference between Navajo and Nuosu Yi decides that PAs and EAs do not share the same semantics; otherwise, they would have the same distributions in gradation structures like AA-marked and CA-marked in Navajo. The second difference decides that we cannot give PAs and EAs in Nuosu Yi the same syntactic analysis as AA-marked and CA-marked adjectives in Navajo, because this analysis predicts a systematic distinction between degree phrases for PAs and EAs, which is in fact absent.

Russian provides another interesting set of facts. Unlike Navajo and Nuosu Yi, Russian does not have two morphologically related groups of dimensional adjectives. Instead, in this language, degree modifiers come in two different forms: synthetic ones (e.g., 69a) and analytical ones (e.g., 69b). Both can modify dimensional adjectives, but only the analytical form can give rise to a norm-related interpretation. For instance, in (69b), the analytical comparative form entails that Katja is tall. It is infelicitous to precede the comparative with a negative proposition stating that Katja is not tall.

- (69) a. Катя не высокая, но она выше, чем Сергей.
 Katja neg tall but she tall-er than Sergej
- b. Катя не высокая, *но она более высокая, чем Сергей.
 Katja neg tall but she more tall than Sergej
 ‘Katja is not tall, but she is taller than Sergej.’

(Krasikova 2009, 277)

Similar to the comparative construction for PAs in Nuosu Yi, the analytical comparative in Russian is incompatible with differential measure phrases, as shown in (70).

- (70) a. Кровать на 4 см/ в 2 раза шире, чем диван.
 bed by 4 cm twice wide-ER than sofa
- b. * Кровать на 4 см/ в 2 раза более широкая, чем диван.
 bed by 4 cm twice more wide than sofa
 ‘The bed is 4 cm wider than the sofa./The bed is twice as wide as the sofa.’

(Krasikova 2009, 279)

In addition, degree questions with analytical degree morphology in Russian do not receive ‘true’ degree answers—they cannot be answered with measure phrases. For instance, (71a) and (71b) both inquire about the comparison class or the relation to the contextual norm. An appropriate answer to (71a) would be something like ‘It is fairly wide’ or ‘It is wide for the desks in our department’ (Krasikova 2009: 278).

- (71) a. Насколько стол широкий?
 by how much desk wide
- b. Насколько стол узкий?
 by how much desk narrow
 lit.: ‘How wide/narrow is the desk?’

Given the facts above, Krasikova proposes that in Russian dimensional adjectives are semantically ambiguous. They receive a vague predicate reading when being modified by an analytical degree expression, or a scalar reading when being modified by a synthetic degree expression. Assuming that the vague predicate meaning of the adjective is derived from composing the scalar meaning of the adjective with the null degree function POS as in (65), this analysis explains the norm-related interpretation associated with the analytical degree expressions. The unavailability of differentials in the comparative in (70) and the lack of ‘true’ degree answers in (71) also follow from the fact that measure phrases are incompatible with the non-degree interpretation of the adjective.

In our analysis, EAs in Nuosu Yi are parallel to the adjective in Russian when they are being modified by synthetic degree expressions. They also show similar behaviors in the comparative and the degree question. The difference is that PAs in Nuosu Yi, unlike adjectives with analytical degree expressions in Russia, do not induce a non-related interpretation. One possible explanation for this distinction, based on Bogal-Albritten (2010), is that POS in Russian is different from POS in Nuosu Yi. POS_{Russian} has an evaluative interpretation as shown in

(65a)(repeated in 72a), but $\text{POS}_{\text{Nuosu}}$ has a non-evaluative interpretation as shown in (72b), whose function is merely to turn the adjective into a characteristic function.

- (72) a. $[[\text{POS}_{\text{Russian}}]]^c = \lambda P_{\langle e, d \rangle} \lambda x. P(x) \geq d_s$
 b. $[[\text{POS}_{\text{Nuosu}}]]^c = \lambda P_{\langle e, d \rangle} \lambda x \exists d. P(x) = d$

7. Conclusions

In this paper, we have provided an empirical description of the adjectival system and gradation structures in Nuosu Yi. We have shown that dimensional adjectives in this language have two morphologically related variants, which we refer to as Positive Adjectives (PAs) and Equative Adjectives (EAs). Both PAs and EAs can be used to form gradation structures, but they differ in distribution: EAs appear in differential comparatives and degree questions/exclamatives; whereas PAs appear elsewhere. We attribute their contrast in distribution to their semantic difference: PAs are context-sensitive vague predicates that do not introduce a degree argument, whereas EAs are degree predicates.

We have also shown that degree morphology in Nuosu Yi, unlike that in English, does not select for gradable adjectives; they modify gradable adjectives and non-gradable predicates. Given our analysis of EAs and PAs, we propose that ‘degree’ modifiers in Nuosu Yi does not quantify over degree argument; rather they operate on the contextual parameter of gradable/non-gradable predicates and the event argument of non-gradable verbs.

Our analysis, if on the right track, provides new empirical support for Beck et al (2009)’s ‘Degree Semantic Parameter’ in (1). Meanwhile it echoes the question raised in Bochnak (2015): why should degrees be subject to this kind of cross-linguistic variation? Bochnak (2015: 36) observes: “It is much less obvious that other logical types should be missing from a language (e.g., individuals, events, worlds), or what a language would look like if such a gap were to exist. I speculate that this point can be linked to the idea that degrees are not in fact basic on a par with other simple types.”

In this regard, Nuosu Yi contributes an interesting perspective. Recall that EAs in Nuosu Yi can have a non-degree based semantics in examples like (2)(repeated below).

- (2) $a^{33} \text{zi}^{55}$ $a^{55} \text{ko}^{33}$ zi^{21} .
 Ayi Aguo as tall as
 ‘Ayi is (at least) as tall as Aguo.’

In (2) the EA zi^{21} acts as a transitive predicate similar to transitive verbs (e.g., to *like*). Thus, we assume that zi^{21} in (2) has the semantics in (73a). In our analysis EAs are ambiguous between the two meanings in (73). On its non-degree-based semantics (73a), it relates two individuals; on its degree-based semantics (73b), it relates individuals to degrees. So what is the relation between these two interpretations?

- (73) a. $[[\text{zi}^{21}]] = \lambda y \lambda x. x \text{ is (at least) as tall as } y.$ $\langle e, \langle e, t \rangle \rangle$
 b. $[[\text{zi}^{21}]] = \lambda d \lambda x. x \text{ is (at least) tall to } d.$ $\langle d, \langle e, t \rangle \rangle$

In Cresswell (1976), degrees are defined as equivalence classes of individuals. That is, John's (maximal) height is defined as a set of individuals whose heights are exactly the same as John's. Assuming that degrees are downward monotone--anyone who is d -tall is also d' -tall for all heights $d' < d$, John's heights can be defined as a set of individuals whose heights are less than or equal to John's heights. Comparing the two meanings in (73), (73a) asserts a relation between individual x and individuals that x is at least as tall as; (73b) asserts a relation between individual x and degrees of height that x is at least tall to. These two meanings seem to converge under Cresswell's definition of degrees.

Our analysis leaves several important questions open. The first question concerns the relation between the contextual parameter of adjectives and the event argument of verbs. As we have discussed in section 5, degree morphology in Nuosu Yi treats the contextual parameter of gradable adjectives on a par with the event argument of non-gradable verbs. If so, what exactly is the nature of the contextual parameter of gradable adjectives? Can we consider the contextual parameter of adjectives as a (type of) situation argument?

Our analysis also raises questions about whether the inherent vagueness approach can properly account for different types of comparisons in crisp judgement contexts (section 3). Kennedy (2011) argues that only the degree-based approach can properly capture the distinction between explicit and implicit comparison in crisp judgement contexts (see van Rooij for an opposite view). Bochnak (2015) shows that in Washo, adjectives do not introduce a degree argument and they can only form comparatives of implicit comparison which is infelicitous in crisp judgement contexts. If our analysis of PAs in Nuosu Yi is correct, it provides counterevidence to Kennedy's claim, as PAs are vague predicates that do not introduce a degree argument, yet their comparatives are acceptable in crisp judgement contexts. For the moment, we do not have an explanation for the contrast between these two languages and have to leave it for future work.

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