The Degree Semantics Parameter and cross-linguistic variation*

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Abstract   The standard degree analysis of gradability in English holds that the function of degree morphology, such as the comparative, measure phrases, and degree adverbs, is to bind a degree variable located in the lexical semantics of gradable predicates. In this paper, I investigate gradation structures in Washo (isolate/Hokan), and claim that this language systematically lacks degree morphology of this sort. I propose that this gap in the functional inventory of Washo stems from variation in whether gradable predicates introduce degree variables that can be bound by such operators, providing further cross-linguistic support for a similar proposal made by Beck, Krasikova, et al. (2009) for Motu (Austronesian). Consequently, if we assume that gradable predicates in English are type $\langle d, \langle e, t \rangle \rangle$, then Washo and English must differ in their lexical semantics for gradable predicates. I also discuss an alternative account for handling the variation observed, couched within the degree-free analysis of van Rooij (2011a,b). Although this account can also capture the cross-linguistic facts, it does so at the expense of a unified analysis of degree constructions more generally. The results of this investigation inform questions about the nature of cross-linguistic

variation in semantics, specifically the division of labor between variation in functional categories and the lexicon.

Keywords: comparison, degrees, gradability, vagueness, cross-linguistic variation, Washo

1 Introduction

In what has become the standard analysis for gradable predicates in English, a gradable predicate (typically a gradable adjective) contains a degree variable, where degrees are taken as a basic semantic type d. The most frequent instantiation of this proposal assumes the presence of a degree argument that must be bound or saturated, yielding a predicate of individuals (Cresswell 1976, von Stechow 1984, Heim 1985, 2001, Kennedy & McNally 2005, among others). The denotation of the gradable predicate *tall* is thus rendered as in (1), where d is a variable over degrees, x is a variable over individuals, and HEIGHT is a measure function relating x to d, a degree on the scale of height.[1]

(1) $[\![tall]\!] = \lambda d\lambda x.\text{HEIGHT}(x) \succeq d$

One of the major motivations for positing a degree variable comes from the fact that gradable predicates can combine with a host of morphology whose function is to specify something about its value. Under this system, degree morphemes are functions from gradable predicate meanings to properties of individuals. Degree morphemes differ from one another in the sort of restriction they place on the degree variable of a gradable predicate. For instance, Kennedy & McNally (2005) model the general case as in (2), where G is a gradable predicate of type $\langle d, \langle e, t \rangle \rangle$, and **R** is a variable for the restriction placed on d.

(2) $[\![\text{Deg}]\!] = \lambda G\lambda x.\exists d[\mathbf{R}(d) \wedge G(d)(x)]$ (Kennedy & McNally 2005, p. 367)

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1 A line of research has argued for an analysis of gradable predicates simply as measure functions of type $\langle e, d \rangle$ (Bartsch & Vennemann 1972, Kennedy 1997, 2007b):

(i) $[\![tall]\!] = \lambda x.\text{HEIGHT}(x)$

Since this view of gradable predicates also makes use of a degree variable of type d in the basic ontology, for the purposes of this paper the 'measure function' analysis will be taken to be equivalent to the 'degree argument' analysis.

Among the degree morphemes analyzed in this way are the comparative morpheme, where **R** imposes the restriction that *d* be greater than some other degree derived from the comparative clause, and measure phrases, where **R** restricts *d* to degrees greater than or equal to the degree named by the measure phrase.[2] In the case where no overt degree morphology is present (i.e., with the absolute or positive form of the adjective as in *Kim is tall*) the null degree morpheme *pos* binds the degree variable and introduces a contextual standard. The formulation of *pos* in (3) is adapted from Kennedy & McNally (2005), where s_G is the standard for *G*.[3]

(3) $[\![pos]\!] = \lambda G \lambda x.\exists d[d \succ s_G \wedge G(d)(x)]$

In the first part of this paper, I examine gradation structures in Washo (isolate/Hokan; California & Nevada), a language that systematically lacks degree morphology of the type in (2) (Bochnak 2013). For instance, to make comparisons, Washo speakers make use of a conjunctive strategy like in (4), whereby two full clauses containing antonymous predicates are juxtaposed, but without any dedicated comparative morphology marking the gradable predicate or the standard of comparison (Stassen's (1985) so-called 'conjoined comparison' construction).[4]

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2 This simplistic view glosses over many details of the syntax and semantics of comparatives and measure phrases. What is important here is that these are all members of the paradigm of degree morphology, which is the crucial feature that Kennedy & McNally's analysis shares with other degree-based accounts.

3 Under a different implementation, the contextual standard is introduced by the silent degree modifier EVAL. See Rett (2007) for details.

4 Washo is a highly endangered language spoken in the Lake Tahoe region of California and Nevada. All Washo data come from primary fieldwork unless otherwise noted. See Bochnak (2013) and Bochnak & Bogal-Allbritten (2015) for methodological discussion on conducting fieldwork on degree constructions, and Matthewson (2004) on semantic fieldwork methodology more generally. The orthography used for Washo examples is adapted from Jacobsen (1964), where most characters generally correspond with their IPA values, with the following exceptions: *c* = [t͡s]; *L* = [l̥]; *M* = [m̥]; *š* = [ʃ]; *y* = [j]. Acute accents over vowels represent stressed syllables. I use the following abbreviations in glosses: 1, 2, 3 = first, second, third person; AOR = aorist; ATTR = attributive; COP = copula; HUM.PL = human plural; IMP = imperative; INCH = inchoative; INS.NMLZ = instrument nominalization; INT.PST = intermediate past; IPFV = imperfective; NC = negative concord; NEG = negation; NMLZ = nominalizer; POSS = possessive; Q = question particle; SG = singular (for Motu data); SR = switch reference; STATIC = static prefix; SUBJ = subject (for Motu data); SUBJ.REL = subject relative; TOP = topic marker (for Motu data). In the presentation of data, I use * to indicate that a sentence is syntactically ill-formed, and # to indicate that a sentence is grammatical, but unacceptable in the given context.

(4)   t'éːliwhu delkáykayiʔ   k'éʔi   daʔmóʔmoʔ
       t'eːliwhu de-ʔil-kaykay-iʔ   k'-eʔ-i   daʔmoʔmoʔ
       man   NMLZ-ATTR-tall-ATTR 3-COP-IPFV woman

        delkáykayiʔéːs   k'áʔaš
        de-ʔil-kaykay-iʔ-eːs   k'-eʔ-aʔ-š
        NMLZ-ATTR-tall-ATTR-NEG 3-COP-AOR-SR

       'The man is taller than the woman.'

       (*Literally:* 'The man is tall, the woman is not tall.')

I propose that this pattern of cross-linguistic variation can be captured by positing variation in the lexical semantics of gradable predicates. Specifically, gradable predicates in Washo lack a degree variable. Instead, they are context-sensitive vague predicates as in (5).

(5) $[\![tall_{Washo}]\!]^c = \lambda x.x$ counts as tall in c

The semantics in (5) contains no measure function, and no degree variable at all. Given the hypothesis that the function of degree morphology is to bind a degree variable, this analysis for Washo explains its absence in this language. In other words, the variation observed between English and Washo in the inventory of functional categories is due to variation in the lexical semantics of gradable predicates, assuming a semantics in (1) for English.

This analysis echoes that of Beck, Krasikova, et al. (2009) for Motu, an Austronesian language of Papua New Guinea. Motu also makes use of conjoined comparison, and lacks other degree constructions as well. An example of a conjoined comparison in Motu can be seen in (6).

(6)   Mary na   lata, to   Frank na   kwadōgi.
       Mary TOP tall,   but Frank TOP short

       'Mary is taller than Frank.'   (MOTU; Beck, Krasikova, et al. 2009, p. 3)

Beck, Krasikova, et al. likewise locate the source of this gap in a parameter of cross-linguistic variation in the lexical semantics of gradable predicates. Their Degree Semantics Parameter (DSP) is given in (7):

(7) *Degree Semantics Parameter (DSP):*
     A language {does/does not} have gradable predicates (type $\langle d, \langle e, t \rangle \rangle$ and related), i.e., lexical items that introduce degree arguments.

     (Beck, Krasikova, et al. 2009, p. 19)

There are two theoretical issues at stake regarding the DSP that I aim to address in this paper. The first is whether we have the right kind of empirical support that leads us to conclude that the DSP, or something like it, is an active parameter of variation that needs to find a place in semantic theory. In their cross-linguistic study, Beck, Krasikova, et al. in fact proposed three distinct parameters to account for the variation observed between the 14 languages they investigated. The parameter that has received the most attention in the literature is their Degree Abstraction Parameter (DAP), which was first proposed by Beck, Oda & Sugisaki (2004):

(8) *Degree Abstraction Parameter (DAP):*
     A language {does/does not} have binding of degree variables in the syntax.   (Beck, Oda & Sugisaki 2004, p. 325)

The DAP is supposed to account for the languages in their study that fail to show negative island effects in comparatives or scope interactions between comparatives and other operators such as modals (these languages are Chinese, Japanese, Mooré, Samoan, and Yorùbá). Such languages would have a positive setting of DSP, but a negative setting of DAP. The DAP, however, has been the subject of much recent scrutiny, particularly on the basis of more data from Japanese (Hayashishita 2009, Kennedy 2007a, Shimoyama 2012, Sudo 2014). For instance, Shimoyama (2012) provides evidence from certain clausal comparatives that display island sensitivities, suggesting that degree abstraction is at work in Japanese after all, thus questioning whether the DAP is the right way to account for the differences between English and Japanese.

While I do not intend to rehearse the arguments for and against the DAP as discussed by these authors, I bring up this issue in order to highlight the contribution of the Washo data to the theoretical debate surrounding Beck, Krasikova, et al.'s proposals. The fact that the validity of the DAP has been called into question (at least for the analysis of Japanese) indicates that their proposed parameters may not hold up to deeper cross-linguistic scrutiny. This point is particularly pressing for the evaluation of the DSP, since in Beck, Krasikova, et al.'s survey of 14 languages, Motu was the sole language that motivated positing the DSP as a parameter of cross-linguistic variation.

No other languages, to my knowledge, have since been claimed to have the negative setting of this parameter.

Second, it is not even clear to what extent the DSP makes the correct predictions for Motu in the first place. In the appendix of their paper, Beck, Krasikova, et al. observe that Motu speakers can make comparisons with differential measure phrases using an element glossed as 'exceed', as shown in (9), while Stassen (1985) offers the example in (10) with another verb glossed as 'exceed'.

(9) Mary na   2cm ai Frank ena lata   e   hanaia.
     Mary TOP 2cm by Frank his height 3.SG.SUBJ exceed

     'Mary is 2cm taller than Frank.'   (MOTU; Beck, Krasikova, et al. 2009, p. 49)

(10) Una na namo, ina   herea-ia
      that is good   this exceeds

      'This is better than that.'   (MOTU; Stassen 1985, p. 48)

Washo thus provides us with a testing ground for subjecting the DSP to further cross-linguistic scrutiny. Previewing what is to come, I will show that the Washo data indeed provide evidence that languages can systematically lack degree morphology, and I argue that this supports the view that the DSP is an active parameter of semantic variation.

This style of analysis for the Washo facts then raises questions about the nature of semantic variation across languages. Matthewson (2001) and von Fintel & Matthewson (2008) argue that research in cross-linguistic semantics should proceed by taking a strong universalist stance of no variation as the null hypothesis, which should only be rejected once evidence from thorough investigation necessitates. In particular, Matthewson (2001) argues that parametric solutions to variation weaken the strong null hypothesis of no variation and that "they must be argued for on the basis of considerable empirical advantages" (p. 157). The DSP is such a parameter, under which languages can vary in quite a fundamental way, namely whether or not they have gradable predicates that introduce degree variables. This raises the question: can we do better? Is there a way to maintain a certain amount of uniformity in the semantics of gradable predicates and degree constructions cross-linguistically without making recourse to a parameter on possible meanings available to languages?

In the second part of this paper, I address this question by considering the alternative hypothesis that gradable predicates in both Washo and English are degreeless vague predicates. Such an analysis for English has been defended by Kamp (1975), Klein (1980, 1991), van Rooij (2011a,b), and Burnett (2014), among others. This view maintains uniformity at the level of the lexical semantics of gradable predicates across languages, but where English and Washo vary would be in terms of the sorts of other logical operations over different abstract metalanguage objects. Although I will show that this analysis can capture the differences between English and Washo, it does so at the expense of a unified analysis of degree constructions more generally. In this sense, the degree-based analysis in terms of the DSP captures the cross-linguistic variation in a much simpler way.

The remainder of the paper is structured as follows. In Section 2 I introduce the Washo data, and show that Washo lacks degree morphology of the sort found in English, including comparatives, superlatives, equatives, measure phrases, and degree adverbs. These findings are consistent with the hypothesis that this language instantiates the negative setting of the DSP. Then in Section 3 I take a step back and ask whether lexical variation is the right way to account for the cross-linguistic facts. In Section 4 I consider how a theory framed within the degree-free analysis for English would handle the cross-linguistic facts, largely drawing on van Rooij's recent analysis. I conclude in Section 5 by speculating on the nature of cross-linguistic variation in view of the analysis I propose, specifically with respect to the apparent absence of degrees in certain languages, and the bounds of cross-linguistic expressivity given such a gap.

2   Gradation structures in a degreeless language

In this section, I outline the landscape of 'degree' constructions and the interpretation of gradable predicates in Washo. The main claim is that Washo lacks any functional morphology that targets a degree variable. I argue that there is no comparative morpheme in conjoined comparisons, with evidence coming from crisp judgment effects, their incompatibility with absolute-standard predicates, and their obligatorily norm-related interpretation. I then show that Washo also lacks measure phrases, equatives, superlatives, and degree adverbs. This systematic gap in degree morphology is taken as evidence that gradable predicates in Washo lack a degree variable, and have a lexical semantics as in (11), repeated from above. The Washo facts thus

provide new evidence for a parameter of semantic variation along the lines of the DSP proposed by Beck, Krasikova, et al. (2009).

(11) $[\![tall_{Washo}]\!]^c = \lambda x.x$ counts as tall in c

Before diving into the Washo constructions, I first briefly outline the morphosyntax of gradable predicates in this language. Lexical items naming gradable concepts have the morphosyntactic distribution of verbs. In (12a), *yasaŋ* 'hot' is a monomorphemic verb stem that is inflected directly for aspect.[5] In (12b), the stem *-kaykay-* 'tall' is flanked by the morphemes *ʔil-…-iʔ*, both glossed as 'attributive', following Jacobsen (1964, 1980).

(12) a. ʔitdíʔyu   yásaŋi   gawguwɨléːs
          ʔit-diʔyu   yasaŋ-i   ge-wguwɨl-eːs
          INS.NMLZ-fire   hot-IPFV   IMP-touch-NEG
          'The stove is hot, don't touch it!'

      b. méːhu ʔilkáykayiʔi
          meːhu ʔil-kaykay-iʔ-i
          boy   ATTR-tall-ATTR-IPFV
          'The boy is tall.'

The set of predicates that must take the attributive *ʔil-…-iʔ* morphology does not seem to be constrained by any semantic feature (e.g., dimensional vs. non-dimensional, absolute vs. relative). Rather, it seems to be a morpho(phono)logical issue: a subset of gradable predicate roots such as *-kaykay-* cannot serve as verb stems on their own, and must be marked by *ʔil-…-iʔ*. These are also the roots that can occur in their unreduplicated form in bipartite verb stems (see Jacobsen 1980 and Section 2.2 below).

Gradable predicates can also appear in a nominalized form, via the derivational prefix *de-* or *t'-* (depending on whether a verbal stem is consonant- or vowel-initial, respectively). This prefix attaches outside the attributive morphology, if it is present in the non-nominalized form. When used predicatively, the nominalized form is accompanied by the copula verb *-eʔ*, which is where verbal agreement and aspectual morphology appear. In (13a), the

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5 That is to say, the verb is marked with a final suffix that is obligatory in finite clauses. Following Jacobsen (1964), I gloss the suffixes *-i* and *-aʔ* as 'imperfective' and 'aorist', respectively, though it is far from clear whether these suffixes carry any temporal/aspectual semantics.

monomorphemic verb stem *yak'aš* 'warm' is nominalized, while in (13b), a stem with attributive morphology is nominalized.[6]

(13) a. díːbe dayák'aš   k'éʔi
          diːbe de-yak'áš   k'-eʔ-i
          sun   NMLZ-warm   3-COP-IPFV
          'The sun is warm.'

      b. méːhu delkáykayiʔ   k'éʔi
          meːhu de-ʔil-kaykay-iʔ   k'-eʔ-i
          boy   NMLZ-ATTR-tall-ATTR 3-COP-IPFV
          'The boy is tall.'

As far as I can tell, there is no semantic difference between scalar predicates when they appear as verbs or in a nominalized form, at least for the constructions to be discussed here.[7] Going forward, these two forms of scalar predicates will be taken to have equivalent semantic interpretations. See Jacobsen (1964, 1996) and Bochnak (2013) for more details on Washo morphosyntax.

2.1 Conjoined comparison as implicit comparison

As I have already indicated, the main strategy for making comparisons in Washo is with conjoined comparison as in (4), repeated in (14). The comparison in (14) is based on a dimensional predicate (using the terminology of Bierwisch 1989), but this construction can also be used with non-dimensional, or evaluative, predicates, as in (15), and for amount comparison, as in (16). As these examples show, the predicate in the second clause is the same as the one in the first clause plus the negation suffix *-eːs*, but a lexicalized antonym pair can also appear in this construction, as shown in (17).

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6 The prefix *de-* is phonetically realized as *da-* when the following vowel is *a* or *o*. Other morphemes in the language also show this type of vowel harmony, including *ge-* 'imperative' in (12a).

7 In Washo generally, verbal predicates receive an episodic interpretation, while the corresponding nominalized forms receive a generic interpretation (Bochnak, Grinsell & Yu 2011).

(14) t'é:liwhu delkáykayiʔ k'éʔi daʔmóʔmoʔ
  t'e:liwhu de-ʔil-kaykay-iʔ k'-eʔ-i daʔmoʔmoʔ
  man NMLZ-ATTR-tall-ATTR 3-COP-IPFV woman

  delkáykayiʔé:s k'áʔaš
  de-ʔil-kaykay-iʔ-e:s k'-eʔ-aʔ-š
  NMLZ-ATTR-tall-ATTR-NEG 3-COP-AOR-SR

'The man is taller than the woman.'

(*Literally:* 'The man is tall, the woman is not tall.')

(15) dawp'áp'ɨl delélegiʔ Mí:giʔáŋawiʔi
  dawp'ap'ɨl de-ʔil-leleg-iʔ Mi:gi-ʔaŋaw-iʔ-i
  flower NMLZ-ATTR-red-ATTR look-good-ATTR-IPFV

  delc'ác'imiʔ Mí:giʔáŋawiʔé:saš
  de-ʔil-c'ac'im-iʔ Mi:gi-ʔaŋaw-iʔ-e:s-aʔ-š
  NMZL-ATTR-yellow-ATTR look-good-ATTR-NEG-AOR-SR

'The red flower is prettier than the yellow one.'

(*Literally:* 'The red flower is pretty, the yellow one isn't pretty.')

(16) Beverly t'é:k'eʔ t'á:gɨm ʔíʔwi demuc'úc'uŋa t'é:k'eŋa
  Beverly t'e:k'eʔ t'a:gɨm ʔ-iʔiw-i de-muc'uc'u-ŋa t'e:k'eʔ-ŋa
  Beverly many pine nuts 3-eat-IPFV NMLZ-sweet-NC many-NC

  ʔiʔwé:saʔ
  ʔ-iʔiw-e:s-aʔ
  3-eat-NEG-AOR

'Beverly ate more pine nuts than berries.'

(*Literally:* 'Beverly ate many pine nuts, she didn't eat many berries.')

(17) mé:hu delkáykayiʔ k'éʔi šáwlamhu
  me:hu de-ʔil-kaykay-iʔ k'-eʔ-i šawlamhu
  boy NMLZ-ATTR-tall-ATTR 3-COP-IPFV girl

  ʔilkúškušiʔaš
  ʔil-kuškuš-iʔ-aʔ-š
  ATTR-short-ATTR-AOR-SR

'The boy is taller than the girl.'

(*Literally:* 'The boy is tall, the girl is short.')

No overt comparative morphology is present in this construction, and in fact there is no evidence that a covert comparative morpheme is present either. To argue for this point, I make use of the distinction between explicit versus implicit comparison. Kennedy (2007a), who borrows the terminology from Sapir (1944), defines these terms as follows:

(18) a. *Explicit comparison:* establishes an ordering relation between objects *x* and *y* with respect to a gradable property *G* using a morphosyntactic form whose conventional meaning has the consequence that the degree to which *x* is *G* exceeds the degree to which *y* is *G*.

      b. *Implicit comparison:* establishes an ordering between objects *x* and *y* with respect to a gradable property *G* using the positive form by manipulating the context in such a way that the positive form is true of *x* and false of *y*.

The key distinction between explicit versus implicit comparison is that the former makes use of dedicated morphology to express the comparison relation, while the latter uses only the positive unmarked form, and a comparison between the two objects is inferred. For instance, the English construction in (19a) contains special morphology that marks the gradable predicate, while the construction in (19b) makes use of the positive (unmarked) form of the gradable predicate, and the *compared to* phrase restricts the comparative class to only Amy and Betty (Kennedy 2007a, 2011, van Rooij 2011a).

(19) a. Amy is taller than Betty.   EXPLICIT COMPARISON
      b. Compared to Betty, Amy is tall.   IMPLICIT COMPARISON

Two of Kennedy's tests for distinguishing explicit and implicit comparisons are whether they give rise to crisp judgment effects, and their (un)acceptability with absolute standard gradable predicates.[8] Based on both of these tests, conjoined comparisons in Washo pattern like implicit comparison, indicating the absence of even a covert comparative morpheme.

Kennedy's first test for explicit versus implicit comparison has to do with whether the construction can be used in crisp judgment contexts (i.e., to make fine-grained distinctions between two individuals with respect to some gradable property). Since implicit comparisons are based on the positive form of a gradable predicate, their use should exhibit the same interpretational

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8 Kennedy (2007a) also makes use of a third test: differential measure phrases, which are acceptable with explicit comparison only. Since Washo does not have a measure phrase construction at all, this test cannot be performed.

features as the positive form more generally. One such feature of the positive form of vague gradable predicates is that it is subject to the Similarity Constraint in (20) (Klein 1980, Fara 2000, Kennedy 2011).

(20)   *Similarity Constraint:* When x and y differ only to a very small degree in the property that a vague predicate G is used to express, speakers are unable or unwilling to judge the proposition that x is G true and y is G false.

Given this constraint, it should therefore be impossible to use implicit comparisons in situations where two objects differ only slightly in the amount they hold a property. Explicit comparisons, meanwhile, only require a non-zero difference in degrees, and are thus acceptable in crisp judgment contexts.

Washo conjoined comparisons behave like implicit comparisons with respect to this test, as shown in (21).

(21)   *Context:* comparing two ladders, where one is only slightly taller than the other.

#wíːdiʔ ʔitmáŋa delkáykayiʔ   k'éʔi   wíːdiʔ
wiːdiʔ ʔitmaŋa de-ʔil-kaykay-iʔ   k'-eʔ-i   wiːdiʔ
this   ladder   NMLZ-ATTR-tall-ATTR   3-COP-IPFV this

   delkáykayiʔéːs   k'áʔaš
   de-ʔil-kaykay-iʔ-eːs   k'-eʔ-aʔ-š
   NMLZ-ATTR-tall-ATTR-NEG 3-COP-AOR-SR

Intended: 'This ladder is taller than that one.'
(*Literally:* 'This ladder is tall, that one is not tall.')

The failure of using this construction in the given context follows if there is no explicit comparative morpheme present, and both occurrences of the gradable predicates are interpreted as vague predicates. The anomaly of (21) arises because in the first clause, the speaker asserts that one ladder counts as tall, while in the second clause, the speaker asserts that the other ladder does not. That is, by using this construction, speakers are required to assert that a property holds of one object, and that its antonym holds of another object. Because vague predicates are subject to the Similarity Constraint, speakers are unwilling to accept the truth of both clauses simultaneously in this context.

Washo speakers can get around this restriction by adding modifiers such as *wewš* (roughly 'almost') or *šemu* (roughly 'really'). One such example of a comparison offered by a speaker in a crisp judgment context is given in (22), which involves *wewš*.[9]

(22)   *Context:* comparing two pine cones that differ minimally in size.

wíːdiʔ   behéziŋaš   lákʼaʔ wíːdiʔ tʼíːyeliʔ wéwši

wiːdiʔ   beheziŋ-aʔ-š   lakʼaʔ wiːdiʔ tʼiːyeliʔ wewš-i

this   small-AOR-SR   one   this   big   almost-IPFV

'This one is bigger than that one.'

(*Literally:* 'This one is small, that one is almost big.')

Such examples are important for showing that Washo speakers do not have difficulty in perceiving small differences between objects, nor are they completely unable to make comparisons in such situations. Rather, whereas English makes expressing comparisons in crisp judgment contexts easy for its speakers (via *-er* comparatives), Washo does so at the expense of greater complexity, requiring speakers to use hedges like in (22).

The second test for explicit versus implicit comparison is their behavior with gradable predicates with absolute standards. Gradable predicates such as *wet*, *dry*, *bent*, *straight*, do not show the same type of context-sensitivity and vagueness of relative standard predicates like *tall* (Kennedy & McNally 2005, Kennedy 2007b). The standards for evaluating the positive form are fixed to a maximum or minimum endpoint of a scale, regardless of context of utterance.[10] It is this lack of context-sensitivity that renders implicit com-

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9 While I do not offer a detailed analysis of these modifiers here, see Section 2.3 for some comments on *šemu*, and Beltrama & Bochnak (To appear) and Bochnak (2013) for more detailed analysis.

10 Kennedy & McNally (2005) note that there are relative uses of absolute standard predicates, in which case they behave like predicates like *tall* in the relevant respects. Under this use, we would expect implicit comparisons to be acceptable. A reviewer offers the following example:

(i) My glass is empty, compared to your glass (your glass is full of beer and mine only has a small amount!)

Likewise, in their relative use, these adjectives also readily accept modification by *very*, which is normally restricted to relative gradable predicates (though see Syrett (2007) and McNabb (2012b) for corpus and experimental data showing that a more nuanced analysis is necessary).

(ii) The restaurant is very empty tonight (compared to a normal Friday).

parisons infelicitous with absolute standard predicates. In fact, a conjoined comparison with absolute standard predicates will always be false, except in the limiting cases where one object holds the property to the maximum or minimum value. Explicit comparisons, however, are acceptable since they only require a non-zero difference in the amount two objects hold the property. This distinction in English is illustrated in (23).

(23)   *Context:* Rod A: ⌢   Rod B: ⌂

    a. Rod B is more bent than rod A.

    b. #Compared to rod A, rod B is bent.

Conjoined comparisons in Washo once again behave like implicit comparisons with respect to this test. This is illustrated in (24) with the same context as (23), where several combinations of both minimum-standard *ʔilk'únk'uniʔ* 'bent', maximum-standard *ʔilšíːšibiʔ* 'straight', and their negations, are attempted.

(24)   Context: same as (23)

    a. #wíːdiʔ ʔilk'únk'uniʔaš   wíːdiʔ ʔilšíːšibiʔi

       wiːdiʔ ʔil-k'unk'un-iʔ-aʔ-š   wiːdiʔ ʔil-šiːšib-iʔ-i

       this   ATTR-bent-ATTR-AOR-SR this   ATTR-straight-ATTR-IPFV

       Intended: 'This one is more bent than that one.'

       (*Literally:* 'This one is bent, that one is straight.')

    b. #wíːdiʔ ʔilk'únk'uniʔi   wíːdiʔ ʔilk'únk'uniʔéːsaš

       wiːdiʔ ʔil-k'unk'un-iʔ-i   wiːdiʔ ʔil-k'unk'un-iʔ-eːs-aʔ-š

       this   ATTR-bent-ATTR-IPFV this   ATTR-bent-ATTR-NEG-AOR-SR

       Intended: 'This one is more bent than that one.'

       (*Literally:* 'This one is bent, that one is not bent.')

    c. #wíːdiʔ ʔilšíːšibiʔi   wíːdiʔ

       wiːdiʔ ʔil-šiːšib-iʔ-i   wiːdiʔ

       this   ATTR-straight-ATTR-IPFV this

         ʔilšíːšibiʔéːsaš

         ʔil-šiːšib-iʔ-eːs-aʔ-š

         ATTR-straight-ATTR-NEG-AOR-SR

       Intended: 'This one is more bent than that one.'

       (*Literally:* 'This one is straight, that one is not straight.')

The form of the conjoined comparison requires the speaker to assert that one of the properties *ʔilší:šibiʔ* 'straight' or *ʔilk'únk'uniʔe:s* 'not bent' holds of one of the rods, which is simply false in the context in (24).

As before, Washo speakers can get around this restriction by adding modifiers, as in (25).

(25)   *Context:* same as (23)

    wí:diʔ ʔilk'únk'uniʔaš   wí:diʔ ʔilk'únk'uniʔ
    wi:diʔ ʔil-k'unk'un-iʔ-aʔ-š wi:diʔ ʔil-k'unk'un-iʔ
    this   ATTR-bent-ATTR-AOR-SR this   ATTR-bent-ATTR

      šemuyé:saʔ
      šemu-e:s-aʔ
      really-NEG-AOR

    'This one is more bent than that one.'

    (*Literally:* 'This one is bent, that one is not very bent.')

In sum, based on Kennedy's (2007a) tests, conjoined comparison in Washo is implicit comparison. This means that there is no evidence even for a covert comparative morpheme at work in these constructions.

Given that conjoined comparisons do not contain a comparative morpheme, together with the semantics for gradable predicates I propose for Washo in (5), the truth conditions for the conjoined comparison in (26) can be stated informally as in (27).

(26)   t'é:liwhu delkáykayiʔ   k'éʔi   daʔmóʔmoʔ
    t'e:liwhu de-ʔil-kaykay-iʔ k'-eʔ-i   daʔmoʔmoʔ
    man   NMLZ-ATTR-tall-ATTR 3-COP-IPFV woman

      delkáykayiʔé:s   k'áʔaš
      de-ʔil-kaykay-iʔ-e:s   k'-eʔ-aʔ-š
      NMLZ-ATTR-tall-ATTR-NEG 3-COP-AOR-SR

    'The man is taller than the woman.'

    (*Literally:* 'The man is tall, the woman is not tall.')

(27) $[\![(26)]\!]^c = 1$ *iff* the man counts as tall, and the woman does not count as tall in *c*

The truth conditions in (27) are simply the conjunction of those of the two conjoined clauses. Note that these truth conditions entail that the man

is taller than the woman, given the Consistency Constraints in (28), which are independently necessary to constrain admissible delineations over the domain of discourse (Klein 1980, 1991, Kennedy 2011, van Rooij 2011a).

(28)   *Consistency Constraints:*

   a.   For any positive form gradable predicate G and objects x and y, if there is a context c such that G holds of x but not of y in c, then for any c' such that G holds of y in c', then G also holds of x in c'.

   b.   For any positive form gradable predicate G and objects x, y and for any context c, if G holds of x but not of y in c, then x exceeds y relative to the scalar concept encoded by G.

The second of these constraints is crucial for the comparison interpretation of conjoined structures. Specfically, if the speaker is committed to the truth of *t'é:liwhu delkáykayiʔ k'éʔi* 'the man is tall', and to the truth of *daʔmóʔmoʔ delkáykayiʔé:s k'áʔaš* 'the woman is not tall', then it follows from (28) that the speaker is also committed to the proposition that the man exceeds the woman in height. That is, while a comparison between the two individuals is not asserted by the speaker of (26), it is entailed by the truth conditions in (27).[11]

2.2   Norm-relatedness in conjoined comparisons and beyond

A welcome outcome of this analysis is that it captures the fact that conjoined comparisons in Washo always receive a norm-related interpretation. That is, the subject of each gradable predicate must hold the relevant property in an absolute sense in order for the comparison to be felicitously uttered. A case in point is (29), where the conjoined comparison in (26) is judged unacceptable in the described context, where both individuals clearly do not count as tall.

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11 A reviewer asks whether it is crucial that the truth conditions in (27) make use of a single comparison class shared by both conjuncts. This is in fact crucial for the comparison entailment to go through via the Consistency Constraints. Otherwise, if the compared objects do not belong to the same comparison class, the inference that one exceeds the other in height may not be valid. This seems correct to me, since in general a conjunction of two sentences need not be understood as a comparison.

(29) *Context:* Comparing a man who is five feet tall and a woman who is four and a half feet tall (i.e., both clearly fall under the negative extension of *tall*)

#t'éːliwhu	delkáykayiʔ	k'éʔi	daʔmóʔmoʔ
t'eːliwhu	de-ʔil-kaykay-iʔ	k'-eʔ-i	daʔmoʔmoʔ
man	NMLZ-ATTR-tall-ATTR	3-COP-IPFV	woman

delkáykayiʔéːs	k'áʔaš
de-ʔil-kaykay-iʔ-eːs	k'-eʔ-aʔ-š
NMLZ-ATTR-tall-ATTR-NEG	3-COP-AOR-SR

Intended: 'The man is taller than the woman.'

Under the proposed analysis, the conjoined comparison is simply false in the context in (29). Furthermore, the facts related to crisp judgment contexts and absolute standard predicates fall out as special cases of the more general property of conjoined comparisons that they are obligatorily norm-related.

I am not in a position at this point to state that obligatory norm-related-ness is an essential property of conjoined comparisons cross-linguistically.[12] For instance, Marsack (1975) offers the following conjoined comparison in Samoan, and notes, "Even in the case of giant vessels like the *Queen Mary* and the *Aquitania* this construction would be used. To indicate that the 85,000 ton *Queen Mary* is bigger than the 45,000 ton *Aquitania*, a Samoan of the old school would say [(30)]" (Marsack 1975, p. 66, cited in Kennedy 2011).[13]

(30) Ua tele le   Queen Mary, ua la'itiiti le   Aquitania
      is big the Queen Mary is small   the Aquitania

      'The *Queen Mary* is bigger than the *Aquitania*.'

(SAMOAN; Marsack 1975)

These anecdotal comments suggest that the comparison in (30) does not obligatorily receive a norm-related interpretation, since it is reasonable to assume that both ships count as big in an absolute sense. Of course, such comments do not constitute a semantic analysis of the construction. For instance, one might say that the relevant comparison class here is a set of large cruise liners, in which case the *Aquitania* might count as small, and

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12 Thanks to Amy Rose Deal and an anonymous reviewer for pushing me to be explicit on this point.

13 In this quote, Marsack is highlighting the fact that younger generations of Samoan speakers do not accept comparisons like (30) and now use a comparison strategy that looks more like an explicit comparison; see Hohaus (2012).

we could say that (30) is norm-related after all. More research is necessary on the semantic properties of conjoined comparison languages to determine whether there are any generalizations to be made in this respect.

Relatedly, further note that obligatory norm-relatedness is not a necessary property of implicit comparisons in general. In fact, as pointed out by Sawada (2009), implicit comparisons like (31) in English (and Japanese) actually carry the implicature that the two individuals are *not* tall (either short, or borderline cases).

(31)   Compared to Betty, Amy is tall.

(*Implicature:* neither actually count as tall.)

The relevant implicature can be derived in Gricean terms as follows. If the speaker of (31) was committed to the truth of *Amy is tall*, then s/he should have said so, without hedging with the *compared to* phrase. But the speaker chose to use (31) instead, leading the hearer to infer that the speaker does not believe *Amy is tall* is true. Crucially, the implicature arises because of the existence of (31) as a competing construction to a plain, unmodified assertion of *Amy is tall* in English. In Washo, the conjoined comparison has no extra morphology, even a *compared to* phrase that flags the construction as a comparison, so no such implicature arises.

Norm-relatedness is also not a property of English explicit comparisons. The sentence in (32) does not entail that either the standard or target of comparison count as tall in an absolute sense.

(32)   Amy is taller than Betty.

a.   ↛ Betty is tall.

b.   ↛ Amy is tall.

On the degree-based analysis for English, the lack of entailment to the positive form is captured by the fact that the comparative morpheme and a null degree operator that contributes the absolute interpretation (*pos*) are in complementary distribution. When the degree argument of the gradable predicate is not bound by the comparative or other degree morphology, the null morpheme *pos* enters the derivation, binding the open degree argument and contributing the absolute semantics. Since it is *pos* that is responsible for the norm-related interpretation, and it is not present in comparatives like (32), the lack of entailments to the positive form is predicted.

Under my analysis for Washo, norm-relatedness comes directly from the vague predicate semantics in (11). Now, if one were inclined to defend a degree-based analysis of Washo gradable predicates, how would such an account deal with the conjoined comparison and norm-relatedness facts? Given that there is no evidence for a comparative morpheme in the language, one would have to say that there is a null *pos* morpheme that binds the degree argument and introduces the contextual standard for each gradable predicate in conjoined comparisons. This analysis thus predicts norm-relatedness in conjoined comparisons, and further maintains a uniform denotation for gradable predicates cross-linguistically, contra my proposal.

Under such a view, we could propose that *pos* is realized in Washo as the attributive morphology *ʔil-…-iʔ* that flanks many gradable predicates, and which I so far have ignored. The composition of the gradable predicate *ʔil-kaykay-iʔ* 'tall' would be derived as in (35) by combining *-kaykay-*, a gradable predicate containing a degree argument as in (33), with the attributive morphology contributing the semantics of *pos*, as in (34):

(33) $[\![\textit{-kaykay-}]\!] = \lambda d\lambda x.\text{HEIGHT}(x) \succeq d$

(34) $[\![\textit{ʔil-…-iʔ}]\!] = \lambda G\lambda x.\exists d[d \succ s_G \wedge G(d)(x)]$

(35) $[\![\textit{ʔil-kaykay-iʔ}]\!] = \lambda x.\exists d[d \succ s_{tall} \wedge \text{HEIGHT}(x) \succeq d]$

Under this proposal, Washo would be a remarkable language from the point of view of degree semantics for at least two reasons. First, it would provide us with an example of a language that has a single-membered set of degree morphemes at its disposal, in contrast to languages like English that have many more.[14] Second, Washo would be a language that has an overt exponent of the *pos* morpheme, addressing a long-standing worry of opponents of the degree analysis that the overt manifestation of this morpheme is absent cross-linguistically. I maintain, however, that this analysis of Washo is undesirable.

First, as I have already pointed out, there are many verbal stems in Washo that do not compose with the attributive morphology, and nevertheless receive a norm-related interpretation. Rather, these verb stems compose directly with verbal morphology without first combining with the attributive affixes. The set of gradable predicates that do not require attributive morphology appears to be random, and not determined by some semantic

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14 I discuss the absence of other degree morphemes in Washo in Section 2.3 below.

parameter (e.g., relative versus absolute standard predicates, or dimensional versus non-dimensional predicates).[15] Thus, under this alternative account, it would simply have to be stipulated that some gradable predicates do not combine with *pos*, or combine with a null version of *pos* that contributes the norm-related semantics.

Second, even the gradable predicates that do combine with attributive morphology receive a norm-related interpretation in environments where the attributive morphology is not present. An environment where the attributive morphology does not occur is in bipartite verb stem constructions, which are formed by the concatenation of two bound morphemes to form a complex verbal stem (Jacobsen 1980, Bochnak & Rhomieux 2013). For instance, the root *-ilp'il-* 'blue' in its predicative use is in a reduplicated form, flanked by the attributive morphemes, as in (36), while it appears as the second element of a bipartite stem in (37).

(36) ʔilp'ílp'iliʔi
     ʔil-p'ilp'il-iʔ-i
     ATTR-blue-ATTR-IPFV
     'It is blue.'

(37) tugílp'ili
     tug-ilp'il-i
     eye-blue-IPFV
     'He has blue eyes.'/'He is blue-eyed.'   (Jacobsen 1964, p. 109)

The semantics of the individual roots that make up bipartite stems can be difficult to test, since many bipartite stems have somewhat idiomatic meanings that are not fully compositional. However, an example relevant for our purposes comes from the bipartite verb form in (38), where the bipartite verb means 'to iron', and includes the root *-i:šib-* 'straight' (compare with (39), where this root appears with attributive morphology).

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15 Roots that must combine with attributive morphology in their reduplicated form include *-hawhaw-* 'light' (weight), *-kaykay-* 'tall', *-k'unk'un-* 'bent', *-kuškuš-* 'short/stumpy', *-leleg-* 'red', *-p'ilp'il-* 'blue', *-popoš-* 'gray', *-ši:šib-* 'straight', *-šišiš-* 'heavy', *-teteb-* 'fat', *-witwid-* 'hard/stiff'. Roots that do not require attributive morphology include *ʔaŋaw* 'nice/good', *ihuk'* 'dry', *metuʔ* 'cold', *mi:p'il* 'full', *mosod* 'wet', *muc'uc'u* 'sweet', *Mile* 'old', *yak'aš* 'warm', *yasaŋ* 'hot'. These are not exhaustive lists, but they serve to make the point that semantic class does not predict whether a root requires the attributive morphology.

(38) didé:šibi
      di-de-i:šib-i
      1-with.instrument-straight-IPFV
      'I'm ironing it.'

(39) ʔilší:šibiʔi
      ʔil-ši:šib-iʔ-i
      ATTR-straight-ATTR-IPFV
      'It is straight.'

Evidence that the verb in (38) contains the norm-related interpretation of the root *-i:šib-* 'straight' comes from the unacceptability of cases like (40). If the root *-i:šib-* has a norm-related semantics, then a denial that the scalar predicate holds should lead to a contradiction. Speakers do in fact judge such cases unacceptable, which is shown in (40).

(40) *Context:* I was ironing my clothes, but I couldn't get all the wrinkles out. The clothes just aren't getting straight.

   #ʔitwáʔ   didé:šibi   ʔišŋa
    ʔitwaʔ   di-de-i:šib-i   ʔišŋa
    clothes 1-with.instrument-straight-IPFV but

     ʔilší:šibiʔetiʔé:si
     ʔil-ši:šib-iʔ-etiʔ-e:s-i
     ATTR-straight-ATTR-INCH-NEG-IPFV

   Intended: 'I ironed the clothes, but they're not straight.'

I take this as evidence that norm-relatedness is encoded directly in the roots of gradable predicates, and is not a contribution of the attributive morphology, or some other silent morpheme that introduces the contextual standard. I therefore suggest that the attributive morphology is semantically vacuous (either denoting the identity function on gradable predicates, or invisible to semantic composition), and appears with scalar roots that for morphophonological reasons cannot function as verbal stems on their own. Such roots must combine with some other morphology, either an initial element of a bipartite stem or the attributive morphology, to appear in a verbal construction.

In sum, these last two subsections have shown that there is no evidence for a comparative morpheme in Washo conjoined comparisons. Furthermore,

gradable predicates always receive a norm-related interpretation in this construction, and also in bipartite verb constructions. These facts are consistent with the hypothesis that gradable predicates in Washo do not contain a degree variable, and in fact fall out quite elegantly from the analysis proposed here. Under this proposal, there is also no need to posit a *pos* morpheme.[16] In the next subsection, I show that Washo not only lacks a comparative morpheme, but also other degree morphology such as measure phrases, equatives, superlatives, and degree adverbs, providing further evidence for my analysis.

2.3 The absence of other degree constructions

Measure phrases like *five feet* in *five feet tall* are members of the class of degree morphemes in a language like English. In Kennedy & McNally's (2005) account, measure phrases denote functions from gradable adjective meanings to predicates of individuals by binding the degree variable and placing a restriction on the value that degree. Elsewhere in the literature, they are taken to denote degrees, or sets of degrees or intervals (von Stechow 1984, Heim 2001, Schwarzschild 2002, 2005, Svenonius & Kennedy 2006). The common component of this style of analysis is that the measure phrase targets a degree variable associated with the gradable predicate. Thus, if gradable predicates in a given language do not contain degree variables, we expect that their combination with measure phrases will not be licensed.

This prediction is upheld in Washo. As shown in (41), measure phrases cannot appear as modifiers of gradable predicates.

(41) *hélmeʔ múʔc'im dewgálisiʔ   Míleyi
      helmeʔ muʔc'im de-w-galis-iʔ   Mile-i
      three   ten   NMLZ-STATIC-winter-ATTR old-IPFV
      Intended: 'He is thirty years old.'

The intended meaning of (41) can be expressed in Washo by using the construction in (42). In this case, a putative measure phrase occurs in a copula construction, with no gradable predicate present in the sentence.

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16 An alternative would be to view *pos* instead as a type-shifting rule that binds the degree variable and provides the norm-related semantics. For example, under Grano's (2012) analysis, type-shifting *pos* applies at the AP level, transforming a $\langle d, \langle e, t \rangle \rangle$ relation into a predicate that can then combine with its subject. The same arguments from the bipartite verb stem data can be used against positing this sort of type-shifting *pos* at the AP level for Washo.

(42) hélmeʔ múʔc'im dewgálisiʔ   k'éʔi
      helmeʔ muʔc'im de-w-galis-iʔ   k'-eʔ-i
      three   ten   NMLZ-STATIC-winter-ATTR 3-COP-IPFV
      'He is thirty years old.'

Given that Washo does have numerals, perhaps a more accurate and enlightening generalization is that Washo does not lexicalize units of measurement. That is, Washo does not have any items such as *foot*, *meter*, *pound*, etc., that lexicalize conventionalized units of measurement along a dimension.

It is of course well known that the inventory and behavior of measure phrases cross-linguistically is quite idiosyncratic (see e.g., Schwarzschild 2005). Many languages, for instance, disallow measure phrases in combination with the absolute form of gradable predicates, but nevertheless allow measure phrases with (explicit) comparatives, where they receive a differential interpretation (Schwarzschild 2005, Grano & Kennedy 2012). Since Washo lacks explicit comparisons, it follows that differential measure phrases are also not found in this language. Additionally, measure phrases are also commonly found with certain prepositional phrases (Zwarts 1997, Zwarts & Winter 2000). Attempts to elicit such structures in Washo, even with nonce measure phrases (e.g., *Beverly is three people ahead of me in line*), have met with some difficulty, and more thorough investigation must be left to future research.

In sum, the combination of measure phrases with gradable predicates in Washo is ungrammatical, and in fact true measure phrases seem not to exist at all in the language. This fact is consistent with, and expected under, the hypothesis that gradable predicates in Washo do not come equipped with degree variables.

Washo furthermore lacks any dedicated equative or superlative morphology. This is actually expected, given the lack of a comparative morpheme in the language. Typological work has shown there is a one-way implication such that there appear to be no languages that we know of that have dedicated equative or superlative morphemes, but lack a comparative morpheme (Bobaljik 2012, Stassen 1985).[17] Translations of English equatives typically involve the comitative suffix *-hak'a* (roughly 'with'), which is used more generally for NP coordination; see (43)-(45).

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17 It should be noted that this typological claim about equatives is based on a smaller sample. See Haspelmath & Buchholz (1998) for a typological survey of equative and similative constructions, and Rett (2013) for a formal analysis.

(43) t'éːliwhuhak'a šáwlamhu t'éːk'eʔ wewgíʔišiʔi
t'eːliwhu-hak'a šawlamhu t'eːk'eʔ w-wgiʔiš-iʔ-i
man-with   girl   much   STATIC-measure-ATTR-IPFV
'The man and the girl are heavy.'
(*Prompt:* 'The man is as heavy as the girl.')

(44) méːhu šáwlamhuhak'a wagayáyʔ-i
meːhu šawlamhu-hak'a wagayayʔ-i
boy   girl-with   talk-IPFV
'The boy and the girl are talking.'/'The boy is speaking with the girl.'

(45) ʔuŋábihak'a demubáːbɨl
ʔuŋabi-hak'a demubaːbɨl
salt-with   pepper
'salt and pepper'

Similarly, there is no dedicated superlative morphology. Washo makes use of a cross-linguistically common strategy (see Bobaljik 2012), whereby the regular comparison construction is used with a universal quantifier as the standard of comparison. The sentence in (46), intended as a superlative, uses conjoined comparison, where the subject of the second clause is *miʔlew* 'everyone'.

(46) *Context:* My son is the tallest in his class.
diŋám ʔilkáykayiʔi míʔlew
diŋam ʔil-kaykay-iʔ-i miʔleʔ-w
1.POSS-son ATTR-tall-ATTR-IPFV everything-HUM.PL
  ʔilkáykayiʔéːsi
  ʔil-kaykay-iʔ-eːs-i
  ATTR-tall-ATTR-NEG-IPFV
'My son is tall, everyone is not tall.'

Finally, I claim that Washo also lacks any degree adverbs along the lines of *very* or *completely* in English. I only sketch an outline of the arguments here; see Beltrama & Bochnak (To appear) and Bochnak (2012, 2013) for more detailed arguments, and analyses of the relevant phenomena.

In English, degree adverbs are sensitive to the scale structure of a gradable predicate and/or whether the gradable predicate is associated with a relative

or absolute standard (Rotstein & Winter 2004, Kennedy & McNally 2005). For instance, *very* modifies gradable predicates with relative standards, which usually coincides with a scale structure lacking maximum and minimum elements, while *completely* only modifies predicates with upper-closed scales, whose set of degrees includes a maximum value. The contrasts in (47) are thus taken as evidence that degree adverbs track distinctions in the sets of degrees included in the scales associated with gradable predicates.

(47)   a.   The bottle is very tall/#closed.
       b.   The bottle is completely closed/#tall.

A promising candidate for a degree adverb in Washo is the modifier *šemu*, which often translated by speakers as 'very'. However, the distribution of *šemu* is much wider than English *very*. As shown in (48)-(50), *šemu* can modify relative and absolute (maximum and minimum) standard gradable predicates alike.[18]

(48)   ʔilkáykayiʔ   šému
       ʔil-kaykay-iʔ   šemu
       ATTR-tall-ATTR   ŠEMU
       'very tall'   RELATIVE STANDARD

(49)   ʔilšíːšibiʔ   šému
       ʔil-šiːšib-iʔ   šemu
       ATTR-straight-ATTR ŠEMU
       'really straight'   UPPER-CLOSED SCALE

(50)   ʔilkʼúnkʼuniʔ   šému
       ʔil-kʼunkʼun-iʔ   šemu
       ATTR-bent-ATTR   ŠEMU
       'really bent'   LOWER-CLOSED SCALE

In fact, *šemu* is not limited to modifying gradable predicates. It can also be used to modify verbs and nouns more generally, and even numerals, as shown in (51)-(54). Such behavior would be surprising if *šemu* were a true degree modifier, assuming verbs and nouns generally do not lexicalize degree variables.[19] The example in (54) is particularly revealing here, for even if we

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18 In cases where English *very* is dispreferred, I use *really* in the free translations.

19 While it might be plausible to claim that a verb like *yaha* 'hurt' lexicalizes a scale of intensity that can be targeted in degree constructions (cf. English *My left hand hurts more than my*

were to grant that in the other examples, *šemu* is targeting a lexicalized scale of closeness to a prototype, such an explanation could not be extended to (54).

(51) lák'aʔ lá:du   yáha šémuyi
      lak'aʔ le-a:du   yaha šemu-i
      one   1.POSS-hand hurt ŠEMU-IPFV
      'One of my hands really hurts.'

(52) t'é:liwhu dókto šému k'éʔi
      t'e:liwhu dokto šemu k'-eʔ-i
      man   doctor ŠEMU 3-COP-IPFV
      'The man is a real doctor.'
      (*Speaker's comment:* "It means he's not a quack!")

(53) lélɨm šému
      lelɨm šemu
      night ŠEMU
      'middle of the night' or 'really dark'

(54) dubáldiʔ šému héːš ʔíʔwi
      dubaldiʔ šemu heːš ʔ-iʔiw-i
      five   ŠEMU Q   3-eat-IPFV
      'Did he eat exactly five (apples)?'

Such evidence has led Beltrama & Bochnak (To appear) and Bochnak (2012, 2013) to propose that *šemu* universally quantifies over a contextual parameter setting that affects the interpretation of the elements it modifies. This general idea involving universal quantification over contexts is quite similar in spirit to the analyses offered by Barker (2002) and Williamson (1999) for the English modifier *definitely*, and McNabb (2012a) for Hebrew *mamaš* 'really'. In Barker's approach, *John is definitely tall* is true in a world $c \in C$ (a member of the context set C) if John counts as tall in c and there is no other $c' \in C$ in which John's height is the same but he does not count as tall in c'.[20] For Williamson, *definitely* applies to a proposition (set of worlds),

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right one, *My left hand hurts a lot*), such an explanation cannot be extended to the rest of the examples in (52)-(54).

20 Interestingly, Barker's analysis is intended to capture the interpretation of *definitely* with relative gradable adjectives like *tall*, and consequently his analysis is degree-based. His

and returns a proposition that is true in all worlds accessible from the actual world, according to some accessibility relation. Similarly, McNabb proposes that the Hebrew modifier *mamaš* 'really' applies to a property and states that the property holds of an individual in all relevant contexts of evaluation.

In sum, the wide distribution of *šemu* leads to the conclusion that it is not a true degree adverb. This finding provides further evidence that Washo lacks degree morphology, consistent with the hypothesis that gradable predicates in this language do not contain degree variables. Of course, it is difficult to definitively prove the non-existence of some element: we always open ourselves up to the criticism that maybe we haven't looked hard enough. Nevertheless, after looking in all the usual places where we tend to find degree constructions cross-linguistically, we have come up empty-handed in our search for them in Washo.

2.4 A brief note on scale structure and degrees

One of the merits of the degree analysis of gradable predicates is that it can easily capture the behavior of relative versus absolute standard predicates by analyzing scale structure as consisting, in part, of a set of degrees (Kennedy & McNally 2005, Kennedy 2007b). The distribution of degree modifiers can then be accounted for by making reference to scale structure. For example, *completely* only modifies those adjectives whose scale consists of a set of degrees that includes a maximum value, ruling out #*completely tall*, while ruling in *completely full*. It appears, then, that a welcome side-effect of the present analysis for Washo is the lack of scale structure effects with *šemu*.

However, it would be wrong to conclude that scale structure distinctions are completely neutralized in this language. Indeed, as observed in Section 2.1, gradable predicates with absolute standards are unacceptable in conjoined comparisons. The relative/absolute distinction must therefore be at work in this language, despite the claim that gradable predicates in Washo make no use of degree variables.

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analysis, though, should be made more general, given that *definitely* regularly modifies other predicates as well (e.g., *It's definitely raining*, *He is definitely a doctor/a champion/Italian*), which makes *definitely* look a lot like *šemu* with respect to cross-categorial modification. Lassiter (2011) provides an update of Barker's analysis for *definitely* in terms of probabilities. This move aims to reconcile the fact that *definitely* leads to higher-order vagueness, whereas universal quantification is not vague.

Such a conclusion provides support for recent research that argues that the relative/absolute distinction is not degree-based after all (Burnett 2014, Gumiel-Molina, Moreno-Quibén & Pérez-Jiménez To appear, McNally 2011, Toledo & Sassoon 2011). For instance, McNally (2011) proposes that relative predicates are based on classification by similarity, whereas absolute predicates are based on classification by rule. Similarity-based classification involves comparing an individual and how it instantiates a property with other individuals and how they instantiate that property. For an object to count as tall, it needs to be compared to other individuals, and be close enough to exemplars that also count as tall in a context. This type of classification requires only a partial match, which accounts for the vagueness of relative standard predicates. By contrast, rule-based classification involves comparing an individual to an abstract representation of what counts as instantiating the relevant property. For example, to decide whether an object counts as full, we only need to know how much of its volume is occupied, and whether that amount is total or not. This type of classification requires a strict matching between representations, which is why rule-based classification is absolute. Toledo & Sassoon (2011), meanwhile, argue that relative standard predicates involve comparison between individuals with respect to that property, while absolute standard predicates involve comparison within the same individual at distinct stages or worlds.

Although the accounts for the relative/absolute distinction without degrees differ in detail, what they have in common is that they involve functional cognitive processes of classification, which seem much less plausibly to be subject to cross-linguistic variation. While it may be the case that English and other degree-based languages might encode the relative/absolute distinction in scale structure (since they makes use of degrees independently of this distinction), what this line of research has revealed is that recourse to degrees is not *necessary* to account for it. Thus, the fact that we observe apparent scale structure effects in certain corners of Washo grammar should not be taken as evidence in favor of a degree-based analysis after all.

2.5 Summary

In this section, I have argued that Washo lacks the functional category of morphemes that target degree variables, including comparative, equative, and superlative morphology, as well as measure phrases and degree adverbs. This systematic gap is what is predicted for languages that instantiate the

negative setting of the DSP, and provides evidence for the parametric nature of the variation observed. We have thus found even more solid evidence that languages can vary exactly along the lines predicted by the DSP as proposed by Beck, Krasikova, et al. (2009). In the remainder of the paper, I turn to the question of how to best represent this variation in the grammar.

3 Lexical variation?

The investigation into the grammar of gradability in Washo has revealed cross-linguistic variation in the inventory of functional degree morphology, which is systematically absent in this language. I have proposed that this variation in the functional domain can easily be accounted for by invoking a parameter on variation in the lexicon, namely the DSP of Beck, Krasikova, et al. (2009). In other words, the presence or absence of degree morphology tracks a distinction in the lexical semantics of gradable predicates across languages.

There are precedents within the framework of truth-conditional semantics for positing parametric lexical variation to account for cross-linguistic variation in some domain of functional morphology. Notably, Chierchia (1998) proposes the Nominal Mapping Parameter on the denotations of bare nouns across languages. In essence, bare nouns may be predicative or argumental, where the former denote properties of individuals, while the latter denote kinds (Carlson 1977). Chierchia furthermore argues that a language's setting of this parameter has consequences for nominal morphosyntax. Languages where bare nouns are always of the argumental type (e.g., Mandarin Chinese) are those that lack a singular/plural distinction, and have a generalized classifier system. By contrast, languages where bare nouns are always of the predicative type (e.g., French) lack bare arguments, requiring nouns to always combine with a determiner to appear in argument position. Languages like English are of a mixed type, where a subset of bare nouns can appear as bare arguments (i.e., bare plurals and mass nouns). Thus, in Chierchia's system, cross-linguistic variation in the logical type of nouns (i.e., at the lexical level) corresponds to variation observed in the morphosyntax of nominal projections (plural formation, determiners, classifiers).[21]

At the same time, a parameter on the presence vs. absence of a particular sort of variable on the basis of the absence of a functional category may seem

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21 See Chung (2000) and Wilhelm (2008) for critiques of the Nominal Mapping Parameter, based on data from Indonesian and Dëne Sųłiné, respectively.

a bit extreme. For instance, no researchers investigating morphologically tenseless languages, to my knowledge, have proposed that such languages lack variables for times. Rather, variables for times in such languages just receive their values in ways different from English and other tensed languages, for example via aspectual morphemes, null tenses, or other temporal operators (see e.g., Bittner 2005 on Kalaallisut; Lin 2006 on Mandarin; Matthewson 2006 on St'át'imcets; Tonhauser 2011 on Paraguayan Guaraní). That is, in the domain of temporal semantics, a lack of morphological tense does not lead us to conclude that a language makes no reference to times as a semantic primitive. This therefore represents a case where a lack of a functional category does not correlate with a semantic parameter over the presence or absence of a basic type in the language, in contrast with the proposal put forth here regarding the status of degrees.[22]

Recall also Matthewson's (2001) assertion that parametric solutions to cross-linguistic variation weaken the strong universalist hypothesis. If a parametric solution is proposed, it must be made on the basis of "considerable empirical advantages" over a solution that maintains universality.

In view of this, one might wonder whether positing the DSP is the right way to go about accounting for the variation between English and Washo. I have already argued extensively in the previous section that gradable adjectives in Washo should not be analyzed as containing a degree variable, as is the standard view for English. But what if the standard view for English is not correct? Several authors have in fact pursued analyses treating gradable adjectives in English as vague degreeless predicates, just as I have proposed for Washo (Kamp 1975, Klein 1980, 1991, van Rooij 2011a,b, Burnett 2014). If these approaches are correct for English, then we cannot classify the variation between English and Washo as lexical – the source of variation must lie elsewhere.

In the following section I outline the degreeless analysis of degree constructions in English, largely drawing from the recent analysis of van Rooij (2011a,b). I identify those aspects of the analysis that would have to be amended to capture the patterns observed in Washo. On the one hand, the conclusion reached there echoes the one based on the DSP: the metalanguage that provides for an empirically adequate analysis of Washo must lack certain elements that are needed (or at least justified) for the characterization of

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22 The comparison here with tense is not quite balanced, since languages lacking morphological tense nevertheless have temporal morphology such as aspect, temporal adverbs, etc., whereas I am arguing that Washo has absolutely no morphology that manipulates degrees in any way.

English, even though those elements are not stated in terms of degrees. On the other hand, the sorts of elements that are missing under this alternative do not form a unified class, suggesting that an analysis for variation in terms of the DSP is more parsimonious overall. I then end the section by briefly outlining an analysis for English offered by Wellwood (2014), which shares features of both the degree-based and vague predicate analyses. I argue that such an analysis does not make the right predictions for the cross-linguistic facts discussed in this paper.

4 A degree-free alternative

There are two major motivations for preferring a vague predicate analysis for scalar predicates over a degree-based analysis, even for English. For starters, Klein (1980) argues that implicating degrees introduces "unjustified complexity" (p. 4) into the model. Indeed, an analysis that gets all the facts right without positing extra theoretical machinery would be more parsimonious than one that requires innovating an extra logical type, assuming equal empirical coverage. Perhaps a more serious objection to the degree analysis of gradable predicates has to do with the way in which the positive (unmarked) form is interpreted. Under the degree analysis, a gradable predicate cannot be directly applied to an individual, since it is not the right semantic type. The degree analysis provides a fix for this by positing a null morpheme *pos* (see (3) in Section 1). Much typological work has observed that across languages, the comparative form tends to be more marked than the positive form (Ultan 1972, Stassen 1985, Bobaljik 2012), whereas under the degree analysis both the positive form and the comparative form are marked by degree morphology. Worse, there seem to be no languages at all that overtly lexicalize *pos*.

However, despite these objections, certain authors have argued that a degree analysis should be maintained for English. First, as argued by von Stechow (1984), the vague predicate analysis has difficulty with differential measure phrases in comparatives, such as (55).

(55) Amy is six inches taller than Betty.

He proposes to treat differential measure phrases as denoting degrees, and furthermore argues that since degrees need to be used in cases like (55), they should be generalized to the whole grammar of gradability.

A second objection against the empirical adequacy of the degree-free analysis for English is raised by Kennedy (2011). Kennedy argues that the vague predicate analysis has difficulty with distinguishing explicit and implicit comparisons, in particular in crisp judgment contexts (as in (56)).

(56) *Context:* Amy is 5 feet 2 inches tall and Betty is 5 feet 1 inch tall.

    a. Amy is taller than Betty.

    b.#Compared to Betty, Amy is tall.

Under a degree-based account, both the comparative form and the positive form are derived by adding degree morphology to an underlying element that contains a degree variable. In the case of (56a), this underlying form combines with the comparative morpheme, resulting in a predicate that is true if Amy's height exceeds Betty's by any non-zero degree. By contrast, in the case of (56b), this underlying form combines with *pos* to yield a vague predicate, which is then subject to the Similarity Constraint (recall (20)). Like von Stechow, Kennedy concludes that the degree analysis for English is in a better position to handle the empirical differences between the positive and comparative forms of adjectives on the one hand and the comparisons in (56a) and (56b) on the other hand with respect to vagueness and crisp judgments.

Although the degree analysis has become standard, some authors have developed more sophisticated tools to circumvent these objections while still maintaining a degree-free analysis for English. I outline these immediately below.

4.1 Simulating degree effects without degrees

Recently, van Rooij (2011a,b) has provided a vague predicate analysis of degree constructions in the spirit of Klein (1980, 1991) using tools from measurement theory (Krantz et al. 1971). Crucial to the account is a four-way classification of scales, based on their complexity.[23] The first type is

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23 Also see Sassoon (2010, 2013) for an introduction and discussion of the different scale types used in measurement theory.

called a nominal scale, which is essentially used for classification and for which there are no greater than or less than relations defined for the values of nominal scales. The second type is an ordinal scale, where objects are assigned values on a scale based on rank order. Greater than and less than relations are defined for ordinal scales, but not operations such as addition or subtraction. The third type is called an interval scale, which can represent differences between values, but not ratios or addition of scalar values. Real-world examples of interval scales are the Celsius and Fahrenheit scales for temperature (Sassoon 2010). The fourth and most complex type are ratio scales, which have all the features of interval scales, plus the operations of addition and multiplication of values. As shown by van Rooij, the properties of degree scales on the standard degree analysis correspond to those of interval and ratio scales. That is, the relevant properties of degrees that make them indispensable according to the standard degree analysis (and in particular for von Stechow and Kennedy's arguments) can be simulated by making reference to interval and/or ratio scales.

With respect to von Stechow's challenge, differential measure phrases can be captured in this system in the following way. Let $\langle X, R, \circ \rangle$, be a ratio ordering scale, where X is a non-empty set of individuals, R a binary relation on X and $\circ$ a concatenation operation such that for a mapping f of individuals to real numbers, $f(x \circ y) = f(x) + f(y)$. The truth conditions of (55) can now be stated along the lines of (57), where f is a mapping from individuals to heights.

(57) $\exists f[f(a) = f(b \circ 6\,\text{in})]$

As for the interpretation of unit names like *inch* here, we can follow a Klein-style analysis whereby they name the equivalence class of objects measuring exactly one inch. These degree-like objects can then be multiplied by scalars, and concatenated with other like objects, given that these operations are defined for ratio scales.[24]

As for Kennedy's challenge, van Rooij (2011a) argues that the distinction between implicit and explicit comparison boils down to a distinction between two types of orderings: a SEMI-ORDER provides the basis for interpreting an implicit comparison, while a (STRICT) WEAK ORDER is required for explicit comparison. These orderings are defined as in (58)-(59).

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24 See Sassoon (2010) for a more detailed treatment of measure phrases within measurement theory.

(58) A SEMI-ORDER is a structure $\langle X, R \rangle$, with R a binary relation on X, a non-empty set of individuals, that satisfies the following conditions:

    a. Irreflexivity: $\forall x \colon \neg R(x, x)$

    b. Interval-Order: $\forall x, y, v, w \colon (R(x, y) \wedge R(v, w)) \rightarrow$
$$(R(x, w) \vee R(v, y))$$

    c. Semi-Transitivity: $\forall x, y, z, v \colon (R(x, y) \wedge R(y, z)) \rightarrow$
$$(R(x, v) \vee R(v, z))$$
<div align="right">(van Rooij 2011a, p. 78)</div>

(59) A (STRICT) WEAK ORDER is a structure $\langle X, R \rangle$, with R a binary relation on X, a non-empty set of individuals, that satisfies the following conditions:

    a. Irreflexivity: $\forall x \colon \neg R(x, x)$

    b. Transitivity: $\forall x, y, z \colon (R(x, y) \wedge R(y, z)) \rightarrow R(x, z)$

    c. Almost Connectedness: $\forall x, y, z \colon R(x, y) \rightarrow (R(x, z) \vee R(z, y))$
<div align="right">(van Rooij 2011a, p. 75)</div>

In measurement theory terms, if $f(x)$ is a measure of x on some dimension, a semi-order $\succ_P$ can be defined as follows, where ϵ is some fixed value (a "margin of error" in van Rooij's terms):

(60) $x \succ_P y$ iff $f(x) > f(y) + \epsilon$

The presence of a margin of error ϵ corresponds to the intuition that implicit comparisons require the objects being compared to differ significantly along the compared dimension (i.e., Kennedy's crisp judgment test). When $\epsilon = 0$, (60) is a weak order. The presence of ϵ captures the vagueness associated with implicit comparisons. It is not merely enough for one individual's measure on the scale to be ordered above the other's; there must be a significant difference between their respective measures.

    Additionally, the two types of comparisons impose different constraints on the models relative to which they are interpreted. For implicit comparisons like in (56b), the vague predicate *tall* is evaluated with respect to a context that includes only Amy and Betty. The crisp judgment effect arises due to the Similarity Constraint: Amy and Betty differ only slightly with respect to height, so we are unwilling to judge the proposition that Amy is tall true and the proposition that Betty is tall false. For explicit comparisons like (56a), van Rooij proposes a constraint on models that requires the existence

of "witnesses" to the compared objects that can be used to construct a comparison class that obviates the Similarity Constraint. That is, there must exist in the model enough other individuals to compare Amy and Betty to, in order to ensure that Amy stands out relative to Betty. This could be either an individual who is like Betty but significantly shorter than Amy, or one who is like Amy but significantly taller than Betty. The extra individuals in the model ensure that the small difference in height between Amy and Betty becomes significant enough to place Amy under the positive extension of *tall* and Betty under the negative extension, allowing the comparative to go through. Thus, degree-like effects can be derived under this system to take care of the distinction between explicit and implicit comparisons.[25]

In sum, the degree-free analysis developed by van Rooij is able to precisely simulate degree effects without actually adding degrees as a basic type in the semantic ontology. Thus, von Stechow and Kennedy's objections to the vague predicate analysis for English are neutralized, as the resulting system can handle even the difficult cases where degrees were argued to be necessary. Under this analysis then, the DSP cannot be invoked to account for the variation between English and Washo, since gradable predicates in both languages are simply vague $\langle e, t \rangle$ predicates. Cross-linguistic variation under this system must therefore be handled in a different way.

4.2   Accounting for variation

The van Rooij-style analysis outlined above invoked special machinery to account for differential measure phrases and to capture the explicit/implicit comparison distinction. Since Washo has neither of these features, it follows then that Washo should lack these very mechanisms.

First, recall that measure phrases, differential or otherwise, are absent in Washo. Under this analysis, Washo therefore would lack (a) the ability to construct unit-length equivalence classes which are lexicalized by unit names like *inch*, and (b) ratio scales where the operations of concatenation and multiplication are defined. Second, to account for the distinction between explicit and implicit comparison, two more assumptions that were necessary for English must be absent in Washo. Namely, Washo would lack the ability

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25 As Kennedy (2011) points out, such a move introduces abstract entities to the model that need not exist in the domains of gradable predicates. That is, in order to explain the crisp judgment facts, the vague predicate analysis must introduce abstract ontological objects after all, essentially re-inventing degrees under a different guise.

to set the "margin of error" value ϵ in (60) to 0, and also lack the ability to construct comparison classes containing abstract "witness" individuals to obviate the Similarity Constraint.

Thus, under the vague predicate analysis, the conclusion reached about how to handle Washo is similar in spirit to that of the degree analysis in terms of the DSP. Simply put, the formal tools and abstract objects in the metalanguage ontology and operations over them are not necessary for the analysis of Washo. The analyses simply differ in what sorts of objects those are. A degree-free analysis is therefore also able to capture the variation between English and Washo, so long as we grant that certain features of the analysis for English can be unavailable for other languages. In fact, Sassoon (2013) suggests that languages may very well vary in terms of what sorts of scales they make use of. For instance, Washo would lack interval and ratio scales, since these are the ones where more complex operations are defined that can simulate degree effects.[26]

Although a vague predicate analysis can indeed find ways to account for the variation between English and Washo, I would like to point out one way in which it is a somewhat less satisfactory account, compared to the standard degree analysis. Under van Rooij's account, the relevant phenomena require different pieces of machinery to get all the facts right for English. Correspondingly, the sorts of operations that must be absent from Washo on this account do not form a unified class. There is no explanation for why Washo should lack exactly the special mechanisms that van Rooij appeals to for his account of differential measure phrases and explicit comparison (e.g., the construction of certain types of comparison and equivalence classes). The degree analysis, meanwhile, can easily explain the Washo facts, namely by appealing to the DSP. Under this view, all degree constructions are analyzed in terms of operations over degrees, so it follows that a language without degrees should lack all the corresponding operations, which is exactly what we find with Washo.

While van Rooij has shown that the range of English data can indeed be accounted for without degrees, the cross-linguistic facts here can be taken as an indirect argument in favor of the degree analysis for English, since it is

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26 Sassoon further suggests that Beck, Krasikova, et al.'s other parameters may also be reduced to the differences between scale types in measurement theory. However, it is not obvious how this idea could account for all of Beck, Krasikova, et al.'s parameters, one of which is a syntactic parameter that determines whether the specifier of DegP may be overtly filled. This is a question that must be left for future work.

quite simple to state the difference between English and Washo in terms of a general parameter on the presence/absence of degree variables in gradable predicates.

4.3 Introducing degrees another way

In this subsection, I briefly outline a recent analysis of degree constructions by Wellwood (2014) that in some sense represents a middle ground between the vague predicate analysis and the degree analysis for English. Under Wellwood's analysis, gradable predicates do not contain a degree variable, but may acquire one in order to participate in degree constructions. Like the more traditional vague predicate analysis, Wellwood's analysis would therefore not locate the difference between English and Washo in the lexical semantics of gradable predicates, but rather in whether or not gradable predicates in a language have the ability to acquire a degree variable from somewhere else.

Under Wellwood's analysis, degrees are introduced by *much*, which combines with a degreeless predicate and returns a degree relation. Simplifying somewhat, this operation can be modeled as in (61) below, where **m** tracks the dimension associated with a predicate *P*. The application of **m** to *P* and an individual returns the degree to which that individual holds *P*.[27]

(61) $[\![much]\!] = \lambda P_{\langle e,t \rangle} \lambda d \lambda x . \mathbf{m}(P)(x) \succeq d$

For most gradable adjectives in English, *much* is silent (see Bresnan 1973). However, Wellwood observes that *much* is obligatory when verbs and nouns enter into degree constructions, as shown in (62)-(63).[28] Given that verbs and nouns are standardly assumed not to contain degree variables themselves, it stands to reason that *much* has the job of introducing degrees and licensing degree constructions in these cases. Wellwood's innovation is thus to generalize this view to gradable adjectives as well, and claim that they do not themselves contain a degree variable either.

27 Wellwood's formal implementation is quite different, since she makes different assumptions about the underlying semantics of the degree-free predicate *P* and the mode of composition between *P* and *much*. I direct interested readers to her dissertation for the details, including a formulation of the restrictions on the value of **m**.

28 Wellwood assumes, following Bresnan (1973) and Hackl (2001), that *more* is underlyingly *much+-er*. Note that versions of (63b) and (63c) (*Al ran as Bill did*; *How did Al run?*) are acceptable under a manner interpretation; see Rett (2013) for discussion.

(62) a. Al ate more soup than Bill did.

    b. Al ate as *(much) soup as Bill did.

    c. How *(much) soup did Al eat?

(63) a. Al ran more than Bill did.

    b.   Al ran as *(much) as Bill did.

    c.   How *(much) did Al run?

Under this style of analysis, the locus of variation between English and Washo would be in the availability of *much* in (61). This analysis makes predictions parallel to those of the DSP: it predicts the complete absence of degree constructions in Washo, since this is entailed by the absence of *much*.

However, there is evidence from Washo that casts doubt on Wellwood's proposal for *much* being uniformly the source of degree variables. It involves the distribution of the Washo word *t'e:k'eʔ*, which is often translated as 'much' or 'many',[29] and which combines with both nouns and verbs to yield an interpretation of "large quantity", as shown in (64)-(65).

(64) méːhu t'áːgɨm t'éːk'eʔ ʔíʔwi
    meːhu t'aːgɨm <u>t'eːk'eʔ</u> ʔ-iʔiw-i
    boy pine nuts <u>many</u> 3-eat-IPFV

    'The boy ate lots of pine nuts.'

(65) dihámuʔáŋawi t'éːk'eʔ léʔwigi Léʔi
    di-hamu-ʔaŋaw-i <u>t'eːk'eʔ</u> le-iʔiw-i-gi L-eʔ-i
    1-feel-good-IPFV <u>much</u> 1-eat-IPFV-SUBJ.REL 1-COP-IPFV

    'When I am happy, I eat a lot.'

Just like English *much*, Washo *t'e:k'eʔ* is used for nominal and verbal comparisons, but does not appear in comparisons based on gradable predicates. The example in (16), repeated here as (66), shows that *t'e:k'eʔ* is used to make amount comparatives, while (67) shows *t'e:k'eʔ* being used with a verbal comparison. Without *t'e:k'eʔ*, these sentences aren't interpreted as comparisons.

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29 In Washo, *t'e:k'eʔ* does not track a mass/count distinction along the lines of English *much/many*. I gloss it as 'much' or 'many' as appropriate for the English translations.

(66) Beverly t'éːk'eʔ t'áːgɨm ʔíʔwi demuc'úc'uŋa t'éːk'eŋa
Beverly t'eːk'eʔ t'aːgɨm ʔ-iʔiw-i de-muc'uc'u-ŋa t'eːk'eʔ-ŋa
Beverly many pine nuts 3-eat-IPFV NMLZ-sweet-NC many-NC
  ʔiʔwéːsaʔ
  ʔ-iʔiw-eːs-aʔ
  3-eat-NEG-AOR
'Beverly ate more pine nuts than berries.'
(*Literally:* 'Beverly ate many pine nuts, she didn't eat many berries.')

(67) méːhu t'éːk'eʔ Múʔuši šáwlamhu t'éːk'eŋa
meːhu t'eːk'eʔ Mu-iʔiš-i šawlamhu t'eːk'eʔ-ŋa
boy much run-forward-IPFV girl much-NC
  Múʔušéːsaš
  Mu-iʔiš-eːs-aʔ-š
  run-forward-NEG-AOR-SR
'The boy ran more than the girl.'
(*Literally:* 'The boy ran a lot, the girl didn't run a lot.')

Comparisons made using *t'eːk'eʔ* show the same semantic behavior as other conjoined comparisons. In particular, they also give rise to norm-related interpretations, as shown in (68).

(68) *Context:* Comparing a man who is 85 years old, and woman who is 75 years old (i.e., both are old).
#t'éːliwhu t'éːk'eʔ dewgálisiʔ k'éʔi daʔmóʔmoʔ
t'eːliwhu t'eːk'eʔ de-w-galis-iʔ k'-eʔ-i daʔmoʔmoʔ
man many NMLZ-STATIC-winter-ATTR 3-COP-IPFV woman
  t'éːk'eŋa dewgálisiʔ k'áʔaš
  t'eːk'eʔ-ŋa de-w-galis-iʔ k'-eʔ-aʔ-š
  many-NC NMLZ-STATIC-winter-ATTR 3-COP-AOR-SR
Intended: 'The man is older than the woman.'
(*Literally:* 'The man is many years, the woman is not many years.')

What this data shows is that *t'eːk'eʔ* in Washo has a similar distribution to *much* in English, occurring with nominal and verbal comparisons, but absent in comparisons based on gradable predicates. But on Wellwood's account, the fact that *much* does not appear on the surface in degree constructions with gradable adjectives is simply a morphological accident. The fact that the

exact same morphological pattern surfaces in Washo as well, a language that displays very different properties from English with respect to comparison and degree constructions, suggests there is a generalization being missed.

5   Conclusion

Recall that Matthewson (2001) and von Fintel & Matthewson (2008) advocate a methodology for cross-linguistic research in semantics whereby the starting point is a null hypothesis of no variation, followed by rigorous testing in particular languages. After such rigorous testing of the grammar of gradability in Washo, I have shown that this language lacks the category of degree morphemes that bind a degree variable in gradable predicates. In particular, this language lacks comparative, superlative, and equative morphemes, measure phrases, and degree adverbs. I proposed to account for these facts in terms of variation in the lexicalization of gradable predicates across languages, specifically in whether they introduce degrees or not. The Washo data thus confirm a similar conclusion that was reached by Beck, Krasikova, et al. (2009) for Motu, who were the first to propose the Degree Semantics Parameter in (7). Since the DSP was posited only on the basis of a medium-depth study of Motu, the detailed study of Washo presented here confirms the existence of languages of this type. Although a theory of cross-linguistic variation may be couched within alternative analyses of gradability, the analysis in terms of the DSP provides a straightforward explanation for the differences between English-like and Washo-like languages, and elegantly accounts for the fact that Washo lacks the entire paradigm of degree constructions. My comparison between the DSP account and its alternatives points to avenues for further exploring the differences in the empirical predictions made by these analytical options, which may be relevant for future cross-linguistic research.

I conclude by reflecting on some of the consequences of the analysis proposed here. First, under my analysis, there are languages that simply lack a basic semantic type, namely degrees. This raises the question of why degrees should be subject to this kind of cross-linguistic variation. 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. For instance, Cresswell (1976) derives degrees from equivalence classes of individuals, and more

recently Anderson & Morzycki (To appear) treat degrees as being derived from state kinds. And of course, deriving degree-like effects indirectly is at the heart of the analyses by Klein and van Rooij. This view of degrees might be able to give us a handle on why a parameter like the DSP might exist in the first place: if degrees don't come "for free" as basic elements in the model, then languages differ on whether they choose to derive them.

Second, given that I have followed Beck, Krasikova, et al. (2009) in stating variation in terms of a parameter, this raises the question of what exactly it means for there to be a semantic parameter, and how far-reaching its consequences are. In my view, the DSP is a way of simply stating the difference between English and Washo with respect to the analysis of gradable predicates and related degree constructions (or lack thereof). It is a question for future research whether degrees are completely absent in Washo, or whether there may be other corners of grammar that nevertheless implicate degrees. For instance, Kennedy (2013) analyzes numerals as denoting higher-order predicates of degrees. Washo does have a fully fledged numeral system (see examples (42), (54) and Jacobsen 1996), and so if a degree-based analysis of numerals is correct, then it may just be that the lack of degrees in this language is restricted to the grammar of gradable predicates, with degrees being available elsewhere in the language.[30]

Finally, this study highlights a question that arises in the context of cross-linguistic research where a language is claimed to lack some category: just how much can a language do without? This question is also posed by Deal (2011) in the context of her analysis of the non-epistemic modal *-o'qa* in Nez Perce as a possibility modal which lacks a necessity counterpart. As Deal puts it: "the option of doing without certain expressions . . . tells us something about how precise a language must be to facilitate efficient communication" (p. 583). Evidently, a language can make do without degrees for expressing comparison, which in fact should be unsurprising given the general features of vagueness and scalarity that support making comparisons in both English and Washo. Future research on other areas of grammar in understudied

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[30] Relatedly, there is the question of how a child comes to learn that s/he is speaking a +/–DSP language. See Hohaus, Tiemann & Beck (2014) who provide acquisition data from English and German children that support the view that children start off with a –DSP language, only later acquiring the positive parameter setting. That is, a –DSP language is available to any language learner, but Washo learners never make the step to a +DSP language during acquisition.

languages will undoubtedly continue to inform us on the range and limits of this type of variation in the semantic component of natural language.

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