

## The Non-Universal Status of Degrees: Evidence from Washo\*

M. Ryan Bochnak

University of Chicago

### 1. Variation in Semantic Types

In the investigation of universals and variation in semantics, a natural question that can be asked is to what extent there exists cross-linguistic variation in the semantic types of particular linguistic expressions that we have reason to believe should be comparable across languages (cf. von Stechow and Matthewson 2008). A related question is whether all languages make use of the same inventory of basic semantic types, and in what ways type differences of this sort have an effect on the grammar of a particular language. At issue in this paper is the status of *degrees*, semantic type *d*. The standard analysis of gradable predicates assumes the presence of a degree argument position that must be saturated, returning a predicate of individuals (Cresswell 1976, von Stechow 1984, Heim 1985, 2001, Kennedy and McNally 2005, among others). The denotation of the gradable predicate *tall* is thus rendered as in (1), where *x* is an individual, and **tall** is a measure function relating *x* to *d*, a degree on the scale of height.

$$(1) \quad \llbracket tall \rrbracket = \lambda d \lambda x. \mathbf{tall}(x) \succeq d$$

Under the degree analysis of gradable predicates, a host of functional morphology can be applied to a gradable predicate denotation like (1) to saturate the degree argument, making reference to or manipulating degrees in some way. The functional degree inventory includes measure phrases, the comparative morpheme, the positive operator, among others, which contribute to the overall grammar of gradability.

In a recent cross-linguistic study examining comparative constructions in 14 languages, Beck et al. (2009) speculate that there may be languages that do not lexicalize a degree argument in scalar predicates. Their evidence comes from Motu, an Austronesian language that they claim lacks a comparative morpheme and other degree constructions. Their proposal

---

\*I am grateful to Washo elders Ramona Dick and Steven James for teaching me their language. I would also like to thank audiences at the University of Chicago, the University of Tübingen, and NELS 42 at the University of Toronto, where this work was presented. This work was supported by grants from the Jacobs Research Fund of the Whatcom Museum and the Phillips Fund of the American Philosophical Society.

is spelled out as a parameter on whether scalar predicates in a given language lexicalize a degree argument. Beck et al.'s parameter specifically only targets the semantic type of scalar predicates in a language. They leave open whether a language could lack degree arguments in scalar predicates but still have functional morphemes that introduce and manipulate degrees. However, if we are faced with considering the possibility that some languages do not lexicalize degree arguments in gradable predicates, it seems natural to expect that there should be languages that lack any reference to degrees at all, both in lexical items and functional morphology.

Taking such a proposal seriously, we can ask the following question: what would a degree-less language look like?<sup>1</sup> First, all scalar predicates would be lexicalized as context-sensitive vague predicates, as in (2):

$$(2) \quad \llbracket \textit{tall} \rrbracket^c = \lambda x.\textit{tall}(x) \text{ in } c$$

That is, scalar predicates like *tall* would not lexicalize a measure function as part of their meaning; they would simply require that an individual counts as 'tall' in a context *c*. Second, we would expect the language not to possess any measure phrases of the sort *five feet in five feet tall(er)*. Following recent work, notably Schwarzschild (2002, 2005), measure phrases are taken to name either degrees or sets of degrees. It follows that if a language makes no reference to degrees, it should not lexicalize any measure phrases. Third, there would be no comparative morpheme whose function is to introduce an asymmetric ordering relation between degrees. Rather, comparison would be implicit in the sense of Kennedy (2007a), where the positive form of a predicate is used without any comparative morphology, and a comparison between objects is inferred. Fourth, we expect not to find any effects of scale structure to be linguistically significant. As argued by Kennedy and McNally (2005), scale structure consists, in part, of a set of degrees ordered along a dimension. If a language lacks reference to degrees, we would expect modifiers not to show sensitivity to scale structure. In particular, we expect to find that modifiers of scalar predicates do not show scale-based selectional restrictions. Finally, we expect that the norm-related interpretation of scalar predicates to be lexicalized directly in the predicate. Under the degree analysis, norm-relatedness is derived by positing a positive operator POS, which forms part of the inventory of functional degree morphemes. In a degree-less system, recourse to POS is not necessary, and it is predicted that scalar predicates have a norm-related interpretation even in comparison contexts, in contrast with languages like English.

I claim that Washo is a degree-less language in the sense described here, and argue that gradation structures in Washo pattern exactly as outlined above. I propose that scalar predicates in Washo are lexicalized as in (2). That is, Washo is like Motu as described by Beck et al. (2009) in not lexicalizing a degree argument in scalar predicates. However, I additionally make the stronger claim that Washo also lacks any functional elements that

<sup>1</sup> In framing the discussion in this way, I am assuming that the degree analysis of gradable predicates and corresponding functional morphology is the correct one at least for languages like English. There is, however, a line of work that denies the existence of degrees even in English, and treats scalar predicates simply as vague predicates, a subset of the  $\langle e, t \rangle$  predicates. Notable examples of this line of work include Kamp (1975), Klein (1980), and more recently van Rooij (2011). Going forward, I set aside these analyses, but they return to the discussion later on in section 6.

make reference to degrees. In the rest of this paper, I show that all the predictions outlined above are upheld in Washo, essentially providing an existence proof that there exist truly degree-less languages, and that reference to type *d* is not a semantic universal. Rather, whether a language makes reference to degrees or not constitutes an important aspect of cross-linguistic variation.

Before diving into the predictions made by the degree-less analysis, I briefly outline the basics of scalar predication in Washo. Washo lacks a distinct morphosyntactic category of adjectives; scalar concepts are typically lexicalized as verb roots, as in (3). Evidence that such forms are verbs comes from the fact that they directly compose with verbal inflectional morphology, such as the imperfective suffix *-i* in (3). In many contexts, we also find a verb stem naming a scalar predicate in a nominalized form, by means of the nominalizing prefix *de-* as in (4). In this case, the nominalized predicate appears with a copula verb *-eʔ-*, which is where verbal agreement and aspectual morphology appears.<sup>2</sup>

- |     |                         |     |                         |            |
|-----|-------------------------|-----|-------------------------|------------|
| (3) | mé:hu ʔil-káykay-iʔ-i   | (4) | mé:hu de-ʔil-káykay-iʔ  | k'-éʔ-i    |
|     | boy ATTR-tall-ATTR-IPFV |     | boy NMLZ-ATTR-tall-ATTR | 3-COP-IPFV |
|     | ‘The boy is tall.’      |     | ‘The boy is tall.’      |            |

As far as I can tell, there is no semantic difference between these two forms, at least for the constructions to be discussed here. For the purposes of this paper, these two forms of scalar predicates will be taken to have equivalent semantic interpretations.

## 2. No Measure Phrases

Measure phrases like *five feet in five feet tall* are typically taken to denote degrees, degree quantifiers, or degree predicates (von Stechow 1984, Heim 2001, Schwarzschild 2002, 2005, Svenonius and Kennedy 2006). Therefore, in a language that makes no reference to degrees, we expect measure phrases not to exist. This prediction is upheld in Washo.

It is of course well-known that the inventory and behavior of measure phrases cross-linguistically is quite idiosyncratic (Schwarzschild 2005, among others). Thus, testing for and detecting measure phrases can be quite difficult. In my investigations, the only example of anything measure phrase-like are phrases that name a number of years, an example of which is in (5):

- |     |                                   |            |
|-----|-----------------------------------|------------|
| (5) | hélmeʔ múʔc'im de-w-gális-iʔ      | k'-éʔ-i    |
|     | three ten NMLZ-STATIC-winter-ATTR | 3-COP-IPFV |
|     | ‘He is thirty years old.’         |            |

In this example, a putative measure phrase occurs in a copula construction, and isn't modifying a scalar predicate *Mile* ‘old’; such a structure is in fact ungrammatical, as in (6).

<sup>2</sup> Unless otherwise stated, all the data in this paper come from my own primary fieldwork with native speakers of Washo. The following shorthands are used in morpheme glosses: 3 = 3rd person, AOR = aorist, ATTR = attributive, COP = copula, IPFV = imperfective, NC = negative concord, NEG = negation, NMLZ = nominalizer, Q = question, SR = switch reference, STATIC = prefix on weather predicates. Characters in Washo orthography not conforming to their typical IPA values are as follows: M = [m̥], ʃ = [ʃ], y = [j].

- (6) \*hélme? mú?c'im de-w-gális-i? Míle-yi  
 three ten NMLZ-STATIC-winter-ATTR old-IPFV  
 Intended: 'He is thirty years old.'

Other attempts to translate measure phrases into Washo result in either (i) the use of the positive form of a scalar predicate, or with modification by *šemu* (roughly 'very/really'; see section 4); or (ii) comments from speakers like "we don't say things like that in Washo."

The point here is that despite the presence of phrases like in (5), measure phrases do not form part of the grammar of gradability in Washo like they do in languages like English. Such behavior is expected if Washo has no lexical items or functional morphology that makes no reference to degrees.

### 3. Implicit Comparison

Kennedy (2007a) (borrowing terminology from Sapir 1944) argues for a contrast between explicit and implicit comparison, both within and across languages:

- (7) 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 in 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 two objects is inferred.

Let us examine this distinction at work in English, which uses both explicit and implicit comparison strategies. Explicit comparison in English is achieved by marking the gradable predicate with *-er/more*. While the exact semantics of the English comparative morpheme is somewhat controversial, two variants are typically found in the literature. One is a 'phrasal' variant, whereby the comparative morpheme takes two individual-denoting phrases and a gradable predicate as arguments, as in (8). The other option is a 'clausal' variant, whereby the comparative morpheme takes two clauses denoting sets of degrees, as in (9).<sup>3</sup> In either case, the job of the comparative morpheme is to introduce an asymmetric ordering between degrees.

$$(8) \quad \llbracket -er_1 \rrbracket = \lambda y \lambda G_{(d,et)} \lambda x. \max\{d' | G(d')(x) = 1\} > \max\{d'' | G(d'')(y) = 1\}$$

$$(9) \quad \llbracket -er_2 \rrbracket = \lambda D1_{(d,t)} \lambda D2_{(d,t)}. \max(D2) > \max(D1)$$

- (10) a. John is taller than Mary.  
 b.  $\max\{d' | \llbracket \mathbf{tall}(j) = d' \rrbracket = 1\} > \max\{d'' | \llbracket \mathbf{tall}(m) = d'' \rrbracket = 1\}$

<sup>3</sup> See Heim (1985) and Kennedy (1997) for an overview of the issues at stake for deciding between the phrasal and clausal analyses of comparatives.

The explicit comparison in (10a) is assigned the truth conditions in (10b). The sentence is true if and only if the maximum degree to which John is tall is greater than the maximum degree to which Mary is tall. Crucially, the ordering relation is introduced by the comparative morpheme, which marks the gradable predicate and consists in an operation over degrees.

In contrast, in the case of implicit comparison there is no morphological marking on the gradable predicate. An example of implicit comparison in English is found in (11), where the standard of comparison is found in a *compared to* phrase.

(11) Compared to Mary, John is tall.

According to Kennedy (2007a), (11) is true in a context *c* if and only if the positive form *tall* is true of John in any context *c'* that is just like *c* except that the domain of individuals includes only John and Mary. In such a context, if it is true that John is tall and Mary is not, then it can be inferred that John is taller than Mary. The function of the *compared to* phrase is to limit the domain to only the two individuals, and evaluate the truth of the gradable predicate relative to only those two individuals (see also Beck et al. 2004). Crucially, implicit comparison makes use of the positive form and does not involve an operation over degrees.

If a language makes no reference to degrees, we expect not to find morphemes that operate over degrees. Specifically, such a language would have no explicit comparison construction, but would instead make use of an implicit strategy to express a comparison between objects. Washo is indeed a language of this type.

### 3.1 Conjoined comparison in Washo

The primary comparison strategy in Washo is conjoined comparison, whereby two independent clauses containing antonymous predicates are juxtaposed, as in (12). This comparison strategy is widely attested in the world's languages. According to Stassen's (1985) typology of comparison constructions in 110 languages, 26 (23.6%) use conjoined comparison as a primary or secondary means of expressing comparison.

(12) t'ɛ:liwɰu de-ʔil-káykay-iʔ      k'-éʔ-i      šáwlamɰu  
 man      NMLZ-ATTR-tall-ATTR 3-COP-IPFV girl  
 de-ʔil-káykay-iʔ-é:s      k'-éʔ-aʔ-š  
 NMLZ-ATTR-tall-ATTR-NEG 3-COP-AOR-SR  
 'The man is taller than the girl.' (lit: 'The man is tall, the girl is not tall.')

The scalar predicates are not marked with any overt comparative morphology in either clause. In (12), we simply find the positive (unmarked) form in a regular predication structure (cf. (4)). Given that there is no special morphosyntactic form involved, conjoined comparison constructions appear to be instances of implicit comparison. However, we should control for the possibility that there is a covert comparative morpheme present (as is suggested in the analyses of Japanese comparatives by Beck et al. (2004) and Kennedy (2007a)).

### 3.2 Tests for explicit vs. implicit comparison

According to Kennedy (2007a), there are at least three tests that distinguish explicit from implicit comparison. These tests target the semantic differences between the comparative and positive forms of gradable predicates. Essentially, what we find is that the semantics of implicit comparison reflects that of the positive form, in particular with respect to vagueness and context-sensitivity, which is expected since there is no dedicated comparative morphology present. The three relevant tests are the following: (i) (non-)acceptability of the comparison in crisp judgement contexts; (ii) (non-)acceptability of the comparison with minimum standard predicates; and (iii) (non-)acceptability with differential measure phrases. Since, as shown in section 2, Washo lacks measure phrases, the last test does not apply, and I therefore focus on the first two. The reader can verify that the English explicit and implicit comparisons in (10) and (11) pattern the way predicted by these tests.

**Crisp judgement contexts:** Predicates like *tall* are vague and context-sensitive, meaning that the truth value of a sentence like *John is tall* greatly depends on the context in which it is uttered. To evaluate the truth of such an utterance, speakers must have a contextually salient standard of comparison in mind, such that if John exceeds such a standard with respect to height, then he can truthfully be ascribed the property *tall*. The value of the standard depends highly on contextual factors, such as what sort of object John is, or for what purpose we are evaluating his height. Furthermore, such predicates require an individual to ‘stand out’ relative to others to be used truthfully (Kennedy 2007b). This means that it is difficult to make distinctions between two individuals that occupy very close positions on a scale. That is, if we accept that John is tall, and Mary is only one half inch shorter than John, then we should also accept that Mary is tall.

What does all this mean for the explicit versus implicit distinction? Since implicit comparison is based on the positive form of the predicate, this type of comparison construction should have the same semantic properties as the positive form. Specifically, implicit comparison should be infelicitous in so-called crisp judgement contexts where there is only a small difference between two objects and neither stands out relative to the other. Explicit comparison, by contrast, only requires an asymmetric ordering between two objects, meaning that the comparative form of the scalar predicate is not vague like the positive form. Therefore explicit comparison is expected to be felicitous even in crisp judgement contexts.

With respect to this test, Washo conjoined comparisons pattern like implicit comparisons. Conjoined comparisons are infelicitous in contexts such as (13).

- (13) a. Context: comparing two ladders that are very close in height  
 b. ??wí:di? t'éwe? dewgí?iš k'-é?-i      wí:di? t'éwe?-ŋa dewgí?iš-és  
     this    much height    3-COP-IPFV this    much-NC height-NEG  
     k'-é?-a?-š  
     3-COP-AOR-SR  
     Intended: ‘This one is taller than that one.’  
     (lit: ‘This one is tall, this one is not tall.’)

Interestingly, conjoined comparisons in crisp judgement contexts improve with the

addition of modifiers. The speaker in (14) circumvents the constraint against using implicit comparison in crisp judgement contexts by describing the standard of comparison in the second clause as *t'í:yeli? wéwši* 'almost big'.

- (14) a. Context: comparing two pinecones that differ minimally in size  
 b. wí:di? behéziŋ-a?-š lák'a? wí:di? t'í:yeli? wéwš-i  
 this small-AOR-SR one this big almost-IPFV  
 'This one is bigger than that one.'  
 (lit: 'This one is small, that one is almost big.')

Thus the addition of modifiers has the effect of enabling speakers to make finer distinctions in such contexts than the unmodified positive form allows.

**Minimum standard predicates:** Certain scalar predicates like *bent* or *wet* have minimum standards as opposed to context-dependent ones. That is, an object need only have a non-zero degree of bend to be considered bent, or a non-zero degree of moisture to be considered wet. Implicit comparison is expected to be infelicitous with such predicates since their standards are not context-dependent, while explicit comparison is predicted to be felicitous because the comparative operator simply requires two distinct degrees of bend or moisture. With respect to this test, conjoined comparisons in Washo pattern like implicit comparisons, as shown in (15).

- (15) a. Context: comparing two bent rods, one more bent than the other (though not a crisp judgement context)  
 b. ??wí:di? ?il-k'únk'un-i?-a?-š wí:di? ?il-ší:šib-i?-i  
 this ATTR-bent-ATTR-AOR-SR this ATTR-straight-ATTR-IPFV  
 Intended: 'This one is more bent than that one.'  
 (lit: 'This one is bent, that one is straight.')

As with the crisp judgement contexts, conjoined comparisons with minimum standard predicates become acceptable with the addition of modifiers. In (16), the speaker hedges by claiming that one rod is bent while the other is 'almost straight'. In (17), the speaker asserts that one rod is bent, while the other is 'not very bent'.

- (16) wí:di? ?il-k'únk'un-i?-a?-š wí:di? ?il-ší:šib-i? wéwš-i  
 this ATTR-bent-ATTR-AOR-SR this ATTR-straight-ATTR almost-IPFV  
 'This one is more bent than that one.'  
 (lit: 'This one is bent, that one is almost straight.')
- (17) wí:di? ?il-k'únk'un-i?-a?-š wí:di? ?il-k'únk'un-i? šemu-yé:s-a?  
 this ATTR-bent-ATTR-AOR-SR this ATTR-bent-ATTR very-NEG-AOR  
 'This one is more bent than that one.'  
 (lit: 'This one is bent, that one is not very bent.')

Once again, the addition of modifiers allows speakers to make distinctions that are not possible with the positive form alone. Such evidence reveals that the unmarked positive

form shows the semantic behavior of the English positive form, even in comparison contexts. We will return to this issue later on in section 5.

In sum, based on Kennedy's 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. The absence of an explicit comparative morpheme that operates over degrees is completely expected if Washo makes no reference to degrees.<sup>4</sup>

#### 4. Distribution of Modifiers

The distribution of degree modifiers is sensitive to scale structure, i.e. the set of degrees associated with a predicate, and the type of standard encoded (Rotstein and Winter 2004, Kennedy and McNally 2005). For instance in English, the degree modifier *very* modifies scalar predicates with relative standards, which usually coincides with a scale structure lacking maximum and minimum elements. Meanwhile, the degree modifier *completely* only modifies predicates whose set of degrees includes a maximum value. That is, scale structure is responsible for the distributional differences between these two modifiers, as observed in (18).

- (18) a. The bottle is very tall/??closed.  
 b. The bottle is completely closed/??tall.

If a language makes no reference to degrees, we expect putative 'degree' modifiers not to show this type of sensitivity to scale structure, since scale structure by hypothesis consists of a set of degrees. I argue that cases of apparent degree modification in Washo in fact operate over  $\langle e, t \rangle$  predicates and do not make any reference to degrees. In this section I present a case study of the modifier *šemu*, which is often translated as 'very', but has a much wider distribution and somewhat variable interpretation across its uses, properties which I argue are the hallmarks of non-degree modification.<sup>5</sup>

First, we observe in (19)–(21) that *šemu* can be used as an apparent intensifier for predicates of all scale types; its distribution is not limited to relative-standard predicates like English 'very'. When *šemu* combines with non-relative standard predicates, a more appropriate translation is 'really'.

- |      |                               |      |      |                              |      |
|------|-------------------------------|------|------|------------------------------|------|
| (19) | de-ʔil-káykay-iʔ              | šému | (20) | ʔil-ší:šib-iʔ                | šému |
|      | NMLZ-ATTR-tall-ATTR           | ŠEMU |      | ATTR-straight-ATTR           | ŠEMU |
|      | 'very tall'                   |      |      | 'really straight'            |      |
|      | (relative standard predicate) |      |      | (maximum standard predicate) |      |

<sup>4</sup> For lack of space, I cannot discuss here another comparison strategy in Washo, a mono-clausal construction where a locative postposition marks the standard of comparison. Preliminary evidence suggests that these are also implicit comparisons, though a full analysis will be left for another occasion. Washo also does not appear to lexicalize superlative or equative morphemes, consistent with the degree-less hypothesis.

<sup>5</sup> There are also other modifiers in Washo that show a similar distributional pattern and variable interpretations across uses, including *wéwš* 'almost' and *hénuy* 'slightly'. A detailed analysis of these modifiers is left to another occasion.



- (21) ʔil-k'únk'un-iʔ šému  
ATTR-bent-ATTR ŠEMU  
'really bent'  
(minimum standard predicate)

Second, *šemu* can be used as a modifier of verbs and nouns generally, and can even modify numerals. Such behavior would be surprising if *šemu* were a true degree modifier.

- |   |  |
|---|--|
| <p>(22) lák'aʔ l-á:du yáha šému-yi<br/>one 1.POSS-hand hurt ŠEMU-IPFV<br/>'One of my hands really hurts.'</p> | <p>(23) lélim šému<br/>night ŠEMU<br/>'middle of the night'/'really dark'</p>                              |
| <p>(24) t'é:liwlu dókto šému k'-éʔ-i<br/>man doctor ŠEMU 3-COP-IPFV<br/>'The man is a real doctor.'</p>       | <p>(25) dubáldiʔ šému hésš ʔ-íʔiw-i<br/>five ŠEMU Q 3-eat-IPFV<br/>'Did he eat exactly five (apples)?'</p> |

In addition to the wide distribution of *šemu*, we also observe in these examples that the semantic effect of the modifier varies somewhat depending on the predication modified. First, *šemu* has a standard-boosting intensification effect with minimum and relative standard predicates, as in (19), (21), and (22). Second, it has a precisification effect, acting as a slack regulator (in the sense of Lasersohn 1999) for predicates that readily allow imprecision in many contexts (e.g. (20), (25)). Third, as seen in (23) and (24), *šemu* can also be used to identify a prototypical or special instance of a predicate.

The wide distribution and somewhat variable semantic effects is evidence for non-degree semantics, in contrast with true degree modifiers such as *very* and *completely*, which have very restricted distributions and consistent semantic effect across uses. Following Bochnak (2011), I analyze *šemu* as a modifier that restricts the interpretation to 'clear cases' of the predicate being modified (cf. also McNabb 2012 for a similar analysis of the Hebrew modifier *mamaš*). To model the contribution of *šemu*, I propose that this modifier incorporates an epistemic or evidential component that is general enough explain its wide distribution, and brings about apparent degree effects in the appropriate cases, building on a similar characterization of English *real(ly)* by Paradis (2003) and Constantinescu (2011). The proposed semantics for *šemu* is given in (26):

$$(26) \quad \llbracket \textit{šemu} \rrbracket = \lambda P \lambda x \lambda w. P(x) \text{ in } w \ \& \ \forall w' \in \text{Dox}_{sp}(w) : P(x) \text{ in } w'$$

Under this analysis, *x is P-šemu* means that *x* falls under the extension of *P* in the actual world and in all worlds consistent with speaker's beliefs. As I now show, this analysis is general enough to capture the wide distribution of *šemu*, as well as its somewhat variable meaning across contexts, including apparent degree effects in certain cases.

First, considering (19), we can see how the intensification effects arise. In such a case, *x* counts as *tall* in the actual world and all accessible worlds consistent with the speaker's beliefs. There are possibly different standards for *tall* in different accessible worlds, and the semantics of *šemu* requires *x* to count as *tall* in all of them. It can then be inferred that *x* is well above the standard in the actual world, yielding the effect of intensification. Second,

the precisification effects come about in a similar way. A maximum standard predicate like *full* can be used imprecisely (Kennedy and McNally 2005), and the standard of precision required can vary from context to context (Laserson 1999). Once again, the contribution of *šemu* requires an object to count as *full* in all doxastically accessible worlds. This means that  $x$  must meet the standard of precision in all those worlds, and in particular the most stringent standard of precision, leading to the precisification effect. Finally, this analysis captures the cases where *šemu* is used to make reference to a prototype, as in (24). What counts as a member of the set of doctors can vary across worlds (e.g. PhDs may be considered doctors in some worlds but not in others). However, if  $x$  counts as a doctor in all accessible worlds, then it can be inferred that  $x$  is a prototypical instance of a doctor, since  $x$  has all the properties of being a doctor in all those worlds. Thus, the prototypicality effects can also be derived under this analysis of *šemu*.

To sum up, the wide distribution and variable semantic effect of *šemu* is evidence that it does not target degrees, in contrast with true degree modifiers like those found in English. This behavior of modifiers is entirely expected in a language that makes no reference to degrees, where the distinction between true degree predicates and non-degree predicates is neutralized. To the extent that modifiers in degree-less languages do show distributional sensitivities, the distinctions at work that contribute to those sensitivities will not be based on scale structure, or to whether a predicate lexicalizes a degree argument or not.

## 5. Obligatory Norm-Relatedness

In the degree analysis of gradable predicates, both the positive and comparative forms are derived from a lexical item of type  $\langle d, \langle e, t \rangle \rangle$ . To derive the positive form under this analysis, a null functional degree morpheme POS is posited, which binds the degree argument to one above a contextual standard, and returns an  $\langle e, t \rangle$  predicate.

$$(27) \quad \llbracket \text{POS} \rrbracket = \lambda G_{\langle d, et \rangle} \lambda x. \max\{d \mid G(x)(d)\} > d_{\text{standard}}$$

Since the underlying lexical entry of gradable predicates are simply relations between individuals and degrees (cf. (1)), the norm-related interpretation comes from the application of the null positive operator. A virtue of this analysis is that it derives the fact that in languages like English, the use of the comparative form does not lead to any inference that the positive form of the predicate holds, which is explained by the obligatory non co-occurrence of POS and the comparative morpheme.

Since POS is part of the inventory of functional degree morphemes, we expect it not to exist in a degree-less language like Washo. But of course, by hypothesis, Washo scalar predicates do not lexicalize measure functions, and are simply vague predicates like (2), which lexicalize the equivalent of English ADJ + POS. This means that the norm-related interpretation is lexically encoded in the scalar predicate itself, and therefore should be present in all its uses, even in contexts of comparison. To show this effect in Washo, I consider the behavior of the positive (unmarked) form of scalar predicates in two comparison contexts: crisp judgement contexts; and comparisons where both objects fall under the negative extension of the predicate.

Recall that the positive form of a scalar predicate is vague, and so cannot be used to make fine-grained distinctions between two objects that occupy distinct but very close positions on a particular scale. Under the degree analysis, this vagueness is contributed by POS. The (explicit) comparative form does not show these properties of vagueness, since POS and the comparative morpheme are in complementary distribution. This also provides the explanation for the observation discussed in section 3 that implicit comparisons are infelicitous in crisp judgement contexts, since implicit comparisons make use of the vague positive form. As we have already seen, such comparisons in Washo are infelicitous in crisp judgement contexts (modulo modification). Recall that the comparison in (13) is infelicitous in a context of comparing two similarly-sized ladders because neither object ‘stands out’ relative to the other with respect to height. That is, the vagueness of the positive form is present even in comparison contexts.

Further evidence comes from comparisons in contexts where both objects fall under the negative extension of the predicate.<sup>6</sup> Recall that under the degree analysis, the comparative form does not entail the positive form, since POS and the comparative morpheme are in complementary distribution. That is, *John is taller* can be true even if *John is tall* is not. In implicit comparison, however, only the positive form is used, so we might expect that comparisons using the positive form are infelicitous in contexts where the positive form is false, that is, when the objects being compared either fall under the negative extension of the predicate. In Washo conjoined comparisons, we find that this is indeed the case.

- (28) a. Context: comparing a man who is five feet tall and a woman who is four and half feet tall (i.e., both clearly fall under the negative extension of *tall*)  
 b. ??t'él:liwɰu de-ʔil-káykay-iʔ k'-éʔ-i daʔmóʔmoʔ  
 man NMLZ-ATTR-tall-ATTR 3-COP-IPFV woman  
 de-ʔil-káykay-iʔ-és k'-éʔ-aʔ-š  
 NMLZ-ATTR-tall-ATTR-NEG 3-COP-AOR-SR  
 Intended: ‘The man is taller than the woman.’  
 (lit: ‘The man is tall, the woman is not tall.’)

A speaker can, however, circumvent this restriction by using a strategy that should by now be familiar, namely modification of the predicate, as in (29).

- (29) a. Context: comparing two small pinecones (not a crisp judgement context)  
 b. wí:diʔ behéziŋ-aʔ-š lák'aʔ wí:diʔ t'íyeliʔ wéwš-i  
 this small-AOR-SR one this big almost-IPFV  
 ‘This one is small, that one is a little bit big.’

What this data reveals is that not only is norm-relatedness preserved in comparison contexts in Washo, but also that norm-relatedness must be relative to the global context, rather than the immediate context. This appears to be an important difference between Washo conjoined comparisons and the English *compared to* construction. Recall that *compared to*

<sup>6</sup> For reasons of space, I omit evidence from comparisons of objects that fall under the extension gap of the predicate, though similar facts obtain.

comparisons are also implicit comparisons according to Kennedy's (2007a) tests. However, the effect of the *compared to* phrase on the context is different from that of the Washo examples discussed here. In the analyses of Beck et al. (2004) and Kennedy (2007a), the *compared to* phrase has the effect of signaling that the speaker is restricting the context to only the two individuals being compared. The result is that the main predicate is true of one individual and false of the other in that restricted context. This means that while *compared to* constructions make use of the positive form, such comparisons can be used even if neither John nor Mary count as tall in the global context, since only the special restricted context is being considered to evaluate its truth.

In fact, English *compared to* comparisons (and their counterparts in Japanese) carry the implicature that neither individual holds the relevant property in the global context (Sawada 2009).<sup>7</sup> By contrast, Washo conjoined comparisons are simply infelicitous in such contexts, modulo modification. We therefore observe cross-linguistic variation in implicit comparisons based on whether they can manipulate the context of evaluation of the positive form. I tentatively suggest that this difference may derive from the fact that English *compared to* comparisons are mono-clausal, while Washo conjoined comparisons are bi-clausal, the idea being that the calculation of the comparison class happens once for each independent clause. Support for this view comes from analogous conjoined structures in English like (30), which entails that John is taller than Mary, but (at least according to my intuitions) can only be used if both *John is tall* and *Mary is short* are true in the global context. Further research is required to flesh out the sources and limits of this variation.

(30) John is tall, Mary is short.

## 6. Conclusion

I claim that the facts reported on here can be best understood if Washo makes no reference to degrees in its basic semantic ontology of logical types. I have shown that Washo is a language that lacks measure phrases, has only implicit comparison, has no true degree modifiers, and whose scalar predicates always receive a norm-related interpretation. This set of properties forms a grammatical system whose behavior can best be explained by assuming that Washo makes no reference to degrees in both its lexical items and inventory of functional meanings. This means that the basic type of degrees is not universally attested cross-linguistically, and whether a language does or does not make reference to degrees is an important aspect of cross-linguistic variation. In terms of the larger picture of the extent and limits of cross-linguistic variation, the conclusion reached in this paper means that an important locus of variation lies in differences in the inventory of basic types. Further research will reveal the extent to which we find such variation between languages, and in particular which logical types are subject to this type of variation.

As alluded to previously (fn. 2), there is an alternative line of research of comparison and gradability that denies the existence of degrees even in English. In such analyses,

<sup>7</sup> The idea is that if the target of comparison is already considered tall in the global context, the use of *compared to* does not change the truth value of *John is tall*. This generates a relevance implicature that John is not tall with respect to the global comparison class (and likewise that Mary is even shorter).

all gradable properties are treated as vague predicates of type  $\langle e, t \rangle$  (Kamp 1975, Klein 1980, van Rooij 2011), i.e., no degree argument is implicated in the lexicalization of scalar predicates. Under this system, ‘degree’ morphemes like the comparative and modifiers like *very* are characterized as operations on contextual parameters and comparison classes. If such an analysis for English is correct, then variation with respect to reference to degrees is not an issue since the logical type for degrees is not present in any language. We are then left with the question of how to explain the variation observed between English and Washo, which I have attributed to a difference in logical type. Proponents of this analysis would then have to say that Washo lacks certain operations over contextual parameters, and corresponding lexicalizations of morphemes that correspond to these operations. Such a characterization seems unlikely to turn out correct, given other facts about Washo we have examined here. For instance, I have analyzed the semantic contribution of the modifier *šemu* as one that makes reference to possible worlds, which themselves could be construed as sets of contexts. Additionally, the vague predicate analysis for languages like English has difficulty accounting for certain important facts such as the behavior of implicit comparison and differential measure phrases (see Kennedy 2011, Beck et al. 2009 for discussion). Therefore, it seems preferable to conclude that the variation observed between English and Washo can be traced back to a type difference, namely whether or not a language makes use of degrees in its basic ontology. This means that the Washo facts discussed here also serve as an indirect argument for the degree analysis of English-like languages.

### References

- Beck, Sigrid, Sveta Krasikova, Daniel Fleischer, Remus Gergel, Stefan Hofstetter, Christiane Savelsberg, John Vanderelst, and Elisabeth Villalta. 2009. Crosslinguistic variation in comparative constructions. In *Linguistic Variation Yearbook*, ed. Jeroen van Craenenbroeck and Johan Rooryck, volume 9, 1–66. Philadelphia: John Benjamins.
- Beck, Sigrid, Toshiko Oda, and Koji Sugisaki. 2004. Parametric variation in the semantics of comparison: Japanese vs. English. *Journal of East Asian Linguistics* 13:289–344.
- Bochnak, M. Ryan. 2011. Managing vagueness, imprecision and loose talk in Washo: the case of *šemu*. To appear in *Proceedings of Semantics of Under-represented Languages of the Americas 6*.
- Constantinescu, Camelia. 2011. Gradability in the nominal domain. Doctoral Dissertation, Leiden University.
- Cresswell, Max J. 1976. The semantics of degree. In *Montague Grammar*, ed. Barbara Partee, 261–292. New York: Academic Press.
- von Stechow, Kai, and Lisa Matthewson. 2008. Universals in semantics. *The Linguistic Review* 25:139–201.
- Heim, Irene. 1985. Notes on comparatives and related matters. Ms. University of Texas at Austin.
- Heim, Irene. 2001. Degree operators and scope. In *Audiatu vox sapientiae*, ed. Caroline Féry and Wolfgang Sternefeld, 214–239. Berlin: Akademie-Verlag.
- Kamp, Hans. 1975. Two theories of adjectives. In *Formal Semantics of Natural Language*,

- ed. Edward Keenan. Cambridge: Cambridge University Press.
- Kennedy, Christopher. 1997. Projecting the adjective: The syntax and semantics of gradability and comparison. Doctoral Dissertation, University of California, Santa Cruz.
- Kennedy, Christopher. 2007a. Modes of comparison. In *Proceedings of CLS 43*, ed. Malcolm Elliott, James Kirby, Osamu Sawada, Eleni Staraki, and Suwon Yoon. Chicago: Chicago Linguistic Society.
- Kennedy, Christopher. 2007b. Vagueness and grammar: The semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy* 30:1–45.
- Kennedy, Christopher. 2011. Vagueness and comparison. In *Vagueness and Language Use*, ed. Paul Egré and Nathan Klinedinst. Palgrave MacMillan.
- Kennedy, Christopher, and Louise McNally. 2005. Scale structure, degree modification and the semantics of gradable predicates. *Language* 81:345–381.
- Klein, Ewan. 1980. A semantics for positive and comparative adjectives. *Linguistics and Philosophy* 4:1–46.
- Lasersohn, Peter. 1999. Pragmatic halos. *Language* 75:522–551.
- McNabb, Yaron. 2012. Hebrew *mamaš* ‘really’ versus real cases of degree modification. Paper presented at the Linguistic Society of America Annual Meeting.
- Paradis, Carita. 2003. Between epistemic modality and degree: the case of *really*. In *Modality in Contemporary English*, ed. Roberta Facchinetti, Manfred Krug, and Frank Palmer, 197–220. Berlin: Mouton de Gruyter.
- van Rooij, Robert. 2011. Implicit versus explicit comparatives. In *Vagueness and Language Use*, ed. Paul Egré and Nathan Klinedinst. Palgrave MacMillan.
- Rotstein, Carmen, and Yoad Winter. 2004. Total adjectives vs. partial adjectives: Scale structure and higher-order modifiers. *Natural Language Semantics* 12:259–288.
- Sapir, Edward. 1944. Grading, a study in semantics. *Philosophy of Science* 11:93–116.
- Sawada, Osamu. 2009. Pragmatic aspects of implicit comparison: An economy-based approach. *Journal of Pragmatics* 41:1079–1103.
- Schwarzschild, Roger. 2002. The grammar of measurement. In *Proceedings of Semantics and Linguistic Theory (SALT) XII*, ed. Brendan Jackson. CLC Publications.
- Schwarzschild, Roger. 2005. Measure phrases as modifiers of adjectives. *Recherches Linguistiques de Vincennes* 34:207–228.
- Stassen, Leon. 1985. *Comparison and Universal Grammar*. Oxford: Basil Blackwell.
- von Stechow, Arnim. 1984. Comparing semantic theories of comparison. *Journal of Semantics* 3:1–77.
- Svenonius, Peter, and Christopher Kennedy. 2006. Northern Norwegian degree questions and the syntax of measurement. In *Phases of Interpretation*, ed. Mara Frascarelli. The Hague: Mouton de Gruyter.

Department of Linguistics  
 University of Chicago  
 1010 E. 59th Street  
 Chicago, IL 60637

bochnak@uchicago.edu