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Revisiting gradability in American Sign Language (ASL)

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This paper addresses gradability in American Sign Language (ASL). The literature has argued that languages may or may not introduce degree variables, i.e., there is cross-linguistic variation as to whether languages should be analyzed as degree- or degreeless. For ASL, the degree-based analysis has been assumed or explicitly proposed. For example, due to the visual nature of ASL (as a language that uses the physical signing space), it has been suggested that it may be able to readily represent scales iconically in the signing space. In contrast, we argue that ASL is a degreeless language, which further means that its modality does not necessarily readily translate into the iconic representation of scales in the signing space. Our discussion is based on a comprehensive examination of 31 adjectives across different constructions (e.g., different comparison strategies, questions targeting degrees, crisp judgments, etc.). We offer evidence from elicitation data from 6 consultants with different profiles.

1 Introduction

A common assumption about gradable predicates in general and gradable adjectives in sign languages in particular is that they introduce a degree argument (Beck et al. 2004; Beck et al. 2009; Bochnak 2015; Deal & Hohaus 2019; Kapitonov 2019); languages with these predicates count as degree languages. In the literature about spoken languages (Kennedy & McNally 2005; a.o.), the presence of degrees is normally tied to accounting for several issues, e.g., degree morphemes, like the comparative *-er* (1c)). In the absence of overt degree morphology, a null degree morpheme *pos* is commonly assumed, so a relation between a degree and a (contextual) standard is established (1a) (i.e., *pos-tall*). A measure phrase (*185 cm*) may also indicate the value of a degree, somebody's height here (1b).

(1) a. Alex is tall.
b. Alex is 185 cm tall.
c. Alex is taller than Lou.

This approach has been applied to ASL (Wilbur et al. 2012; 2018; Kentner, 2020; see also Kuhn 2017; Strickland et al. 2017). Furthermore, it has been argued that the representation of degrees may be natural in sign languages. Focusing on LIS, Aristodemo & Geraci (2018) build on the visual nature of signing and argue that some adjectives represent degree variables explicitly, building on the visible difference between expressions, e.g., ASL TALL*(neutral-space)* and TALL*(at-signer's-head)* (2).[1]

(2) ALEX a-IX TALL*(neutral-space)* JO b-IX TALL*(at-signer's-head)*


'Alex is this tall; Jo is this tall.' (≈ 'Jo is taller than Alex.')

This suggests that ASL, like LIS, would have the potential of visually depicting scales. Thus, pursuing an analysis of ASL with degrees would seem natural. For instance, Kentner and Aristodemo & Geraci extend this approach to comparative morphemes (synthetic .COMP, analytic MORE 'more', and BEAT 'exceed'); Kuhn (2017) and Strickland et al. (2017) assume this view for the verbal domain; others extend it to other phenomena (Matsuoka & Gajewski 2013 for

[1] We offer images from four sources featuring deaf and hard-of-hearing (DHH) signers: https://asl-lex.org/, https://aslsignbank.haskins.yale.edu/, https://www.youtube.com/@ASLTHAT, and https://www.Lifeprint.com. We also incorporate still-shots produced by co-authors. Several naturalistic examples from teacher training materials are available here (see lessons 1–36): https://www.youtube.com/watch?v=vGh12x58hoI&list=PL60GgJ-A96ix_5YaoxuZ-YSPljrrGbs_H6&index=36.

Japanese Sign Language; Aristodemo et al. 2022 for Chinese Sign Language). In contrast, this paper argues for a view of ASL as a degreeless language similar to Washo and Nez Perce (Beck et al. 2004; Beck et al. 2009; Bochnak 2015; Deal & Hohaus 2019; Kapitonov 2019). Our analysis is based on the observation that several properties related to gradability in ASL follow (more) naturally from an approach where no degree variables are introduced.

We base our discussion on the examination of 31 adjectives across different constructions in diagnosing degree and degreeless languages (comparison strategies, differential comparatives, degree questions, crisp judgments, etc.). To complement previous research, we offer evidence from an elicitation paradigm with 6 consultants (Matthewson 2004; Bochnak & Matthewson 2015). The resulting data show that a degreeless approach more parsimoniously captures the properties of gradability in ASL. This further means that it should not be simply taken for granted that sign languages readily represent degree variables due to their visual nature (contra Aristodemo & Geraci 2018); instead, we may find the same kind of variation observed in spoken languages. Thus, this paper extends this discussion to sign languages, thus enriching our understanding of the debate surrounding adjectival mapping by considering not only a cross-linguistic view by examining another language, but also a cross-modality one.

The paper is organized as follows. Section 2 introduces the degree and degreeless debate. Section 3 discusses our methodology. Sections 4 and 5 discuss the predicates and constructions on which our claims are based. Section 6 sketches initial analyses of some constructions in ASL. Section 7 concludes. In the Appendix, we include further discussion and examples.

2 Gradability

The literature distinguishes two approaches to gradability (Hohaus & Bochnak 2020): (i) one in which gradability adopts degree variables—a degree approach (Cresswell 1976; Klein 1991; Kennedy & McNally 2005; Pedersen 2015; Martínez Vera 2021a,b), and (ii) another one in which gradability does not make reference to such objects—a degreeless approach (Kamp 1975; Klein 1980; 1991; Beck et al. 2009; van Rooij 2011; Burnett 2014; Bochnak 2015; Deal & Hohaus 2019; Kapitonov 2019).[2] This section provides an overview of these approaches from a semantic perspective. English is used for illustration.

[2] There are approaches that make do without degrees (e.g., van Rooij 2011). These have also been applied to languages like English, which display the typical properties accounted for with degrees (Kennedy & McNally 2005). We adopt Bochnak's (2015) view: there are reasons to prefer a degree vs. degreeless approach in accounting for cross-linguistic variation. For example, although a degreeless approach can account for degree and degreeless languages (English vs. Washo), this parametric variation offers "different pieces of machinery" (e.g., the machinery needed to account for degree questions or measure phrases), which "do not form a unified class" (Bochnak 2015: 36). Assuming degrees provides a unified account for all phenomena in a degree language; similarly, absence of degrees accounts for clusters of properties by means of a single explanation.

Under the degree approach, gradable predicates are characterized by scales *S*—i.e., sets of linearly ordered degrees *d* along some dimension associated with the predicate. Gradable predicates introduce a degree variable, and degree markers determine how that degree relates to some other degree, which may be contextual, might arise via a comparative expression, etc. The denotation of a predicate like *tall* appears in (3)—it captures the degree of height of an individual.

(3) $[\![\textbf{tall}]\!] = \lambda d \lambda x[x \text{ is } d\text{-tall}]$

Predicates like *tall* combine with degree markers, e.g., degree morphemes (measure phrases may also occupy this slot). A possible denotation for the covert degree morpheme *pos*, which combines with adjectives (3), appears in (4a). It relates the degree in the denotation of the adjective to the standard of comparison, which is the minimum required to stand out in context. Thus, the denotation of *Mary is tall* in (4b) is true iff Mary's height is at least equal to the degree represented by the standard.

(4) a. $[\![\textbf{pos}]\!] = \lambda P_{\langle d,et\rangle} \lambda x \exists d[P(x)(d) \,\&\, d \geq stnd(P)]$
b. $[\![\textbf{Mary is pos-tall}]\!] = 1$ iff $\exists d$[Mary is d-tall & $d \geq stnd(tall)$]

The comparative *-er* (or *more*) also makes use of degrees. A possible denotation for *-er* appears in (5a) (we set aside syntactic details and a full-fledged semantics). (5a) compares two degrees in the same scale with one being greater—it does not matter whether the degrees are far away or not in the scale, i.e., nuanced distinctions can be captured. The denotation of *Mary is taller than Sue* appears in (5b): (5b) is true iff Mary's height exceeds Sue's height.[3]

(5) a. $[\![\textbf{-er}]\!] = \lambda P_{\langle d,et\rangle} \lambda y \lambda x \exists d, d'[P(x)(d) \,\&\, P(y)(d') \,\&\, d > d']$
b. $[\![\textbf{Mary is taller than Sue}]\!] = 1$ iff $\exists d, d'$[Mary is d-tall & Sue is d'-tall & $d > d'$]

In a degreeless approach, gradable predicates involve individuals with some property in context. Following Klein (1980), this involves partitioning the domain of individuals into three sets: the set of individuals with some property (i.e., the positive extension of some predicate), the set of individuals without the relevant property (i.e., the negative extension of that predicate), and the set of individuals that cannot be categorized within one set or the other (the extension gap). An individual counts as tall when it belongs to the positive extension of this predicate in context;

[3] An alternative for the comparative includes a differential degree—the degree representing the difference between the two degrees in the comparison (Kennedy & Levin 2008). In some proposals, a differential measure function is added on top of (5) (Pedersen 2015); a proposal along these lines would be needed here for measure expressions (e.g., *2 cm*). Importantly, this is done based on the degrees that are already present in the semantics.

there is no room for degree morphology (or measure phrases) in the above sense. The denotation of *tall* appears in (6a). (6b) exemplifies *Mary is tall*: Mary belongs to the positive extension of the predicate in context.

(6) a. $[\![\textbf{tall}]\!]^c = \lambda x[x \text{ counts as tall wrt } c]$
b. $[\![\textbf{Mary is tall}]\!]^c = 1$ iff Mary counts as tall wrt c

One can also capture nuanced comparisons in this approach using comparative morphology. Thus, *-er* (or *more*) is understood in terms of individuals belonging or not to the positive extension of some predicate.[4] The denotation of *Mary is taller than Sue* appears in (7b): (7b) is true iff, relative to a context, Sue does not count as tall, but Mary does.

(7) a. $[\![\textbf{-er}]\!]^c = \lambda P_{\langle k,et\rangle}\lambda y\lambda x\exists c'[P(x)(c') = 1 \,\&\, P(y)(c') = 0]$
b. $[\![\textbf{Mary is taller than Sue}]\!]^c = 1$ iff $\exists c'$[Mary counts as tall wrt c' & Sue does not count as tall wrt c']

These two approaches can capture similar pieces of data, such as the ones discussed above. As is well-known, however, there are many more expressions and tests in connection to gradability: implicit comparatives, measure phrases, degree questions, equatives, etc. Crucially, comparatives with a differential measure expression, e.g., *Mary is 1 cm taller than Bill*, where *1 cm* captures the difference in height, offer the key test for the presence of degrees in a language (von Stechow 1984). The question we ask is what approach makes appropriate predictions to capture clusters of properties in the most parsimonious way in ASL.

3 Methodology

Our methodology consists of original observations in publicly available curricular materials, followed by elicitation and playback with native signers, which is parallel to previous reports in the literature (Schlenker & Lamberton 2019b; a.o.). There are two notable differences: the number of steps (8), and the number of consultants. Unlike other elicitation research, this study relies on the data from 6 language consultants: 4 core and 2 additional; among the core consultants, 2 are primary.

Elicitation (over Zoom) consisted of three independent steps (8a–c). The fourth step (8d) involved playback and the final judgment. For a subset of data, an email with glosses was used. The time lapse between sessions was a month minimum.

[4] We assume type *et* for adjectives; Monstrous Function Application is also assumed, so context variable of type *k* is introduced (Klein 1980).

(8) *Elicitation and playback*

a. The contextual scenario was introduced in ASL. The consultant was asked to describe the situation using the target lexical items in conversation with another native signer.
b. Elicited sentences were checked for several strategies in production.
c. The consultant's decision was followed by discussion of potential alternatives.
d. The resulting data were subjected to an additional check (a discussion between Deaf or Coda (child of deaf adult) consultants, with and without the presence of the hearing co-PIs) and followed by a playback of the signer's own production. The playback session consisted of the collection of acceptability judgments and resulted in discarding [wrong, I made a mistake] or keeping [correct] the relevant sentence.

Out of the 4 core consultants, the two primary consultants (co-authors) are a Deaf of Sibling (DoS[5]) and a Deaf of Hearing (DoH). The latter was identified neonatally (1 w.o.), was exposed to ASL early (9 ms.o.), and received all their schooling in ASL. This profile allows us to assume that both consultants have native judgements in ASL (Enns et al. 2021). Both individuals hold professorships in ASL, Linguistics, or Deaf-Studies related fields in research institutions in the US, and have decades of experience in ASL teacher training and language assessment creation. The other two core consultants are Codas (hearing children of deaf adults); both hold advanced degrees in linguistics, have decades of experience in sign language assessment creation, interpreting and interpreter training. All four reside in the Eastern part of the US (from upstate New York to the District of Columbia) but acquired ASL in other states. Two are men (one hearing, one deaf); two are women (one hearing, one deaf). Further, a subset of the elicitation dataset was administered to two additional consultants (two Deaf graduate students at Gallaudet University with no association with this project: DoH but with many years of signing experience). Thus, every datapoint has received multiple opportunities for a variety of treatments by different signers. Our observations represent a variety of language users, deaf and hearing, all with advanced levels of proficiency in English and ASL; ASL is the native language of every consultant.

Following usual conventions, ASL glosses appear in CAPs. The line above the utterance indicates the spread of a non-manual marking (e.g., eye-brow raise) associated with topicalization or a *wh-/yes-/no*-question. The letter or number separated with a dash (e.g., a-) indicates the area of the signing space for a particular referent and, thus, the locus of a shift (e.g., '1' indicates the first person, i.e., the signer). Subindices (i, j, k) indicate coreference. Adding '+' indicates the production of the sign multiple times, sometimes in the same area (e.g., '+ + +') or along a particular trajectory, with or without punctuated movement ('> + > +' and '> > >'); this convention is employed elsewhere (Pfau & Steinbach 2006; Schlenker & Lamberton 2019a).

[5] Based on self-identification.

4 Gradable expressions in ASL

Previous literature on adjectives in ASL (and gradability-related phenomena more generally) has been sparse, although it has increased in recent years. Most explore the associated syntactic structures (McLaughlin 1997; Padden 1983; Bernath 2010; Wilbur et al. 2018; Rubio-Fernández et al. 2022) but also make some direct semantic contributions (Wilbur et al. 2012; Aonuki 2019; Kentner et al. 2020). These works manipulate a limited number of predicates in explicit comparative contexts, ranging between 1 and 30+ participants. However, results of most of the works engaging with this issue are either orthogonal to our research question (i.e., they don't address the presence or absence of degrees in ASL adjectives), or researchers simply assume degrees (Wilbur et al. 2012).

To our knowledge, Kentner (2020) is the only source that explicitly examines the presence of degrees in ASL adjectives, though her focus is (potentially) different and so too some of her diagnostics, which align ASL along the Degree Abstraction Parameter (Beck et al. 2009). While Kentner (2020) also records data from 6 native signers, her methodology is different from ours: she elicits utterances with pictures representing different contexts. Focusing on MORE, BEAT, and *.intens* (see section 5.2), she examines differential comparatives, degree comparisons, relation to the positive form, subcomparatives, and degree modification. Kentner concludes that gradable predicates in ASL must involve degree variables if these constructions are available in the language. While she ends up adopting a degree view of ASL, this choice does not find strong support in her data: she observes much variability in judgments, with no test providing conclusive evidence for the presence of degrees. In fact, the results suggest otherwise, since most consultants reject the key stimuli, such as cases with differential measure expressions (von Stechow 1984).

For illustration, we include Kentner's (2020) results involving a differential measure expression in the BEAT-construction (see section 5.3). **Table 1** records major variability among signers, with most participants rejecting the grammaticality of the target stimuli altogether.[6]

While most consultants reject the relevant stimuli, a question remains as to what to make of the cases judged grammatical. To that end, we re-examine the data by providing a comprehensive survey building on the previous literature on the topic, both in ASL and spoken languages. Our starting point is a large and diverse number of gradable predicates in ASL. We have collected data from 31 predicates (9).[7] The list expands on Loos (2018), Bernath (2010), Wilbur et al.

[6] For instance, the first sentence would correspond to an English string like *Bruno beats Karl in being heavy by 20 pounds*. See Kentner (2020: 114) for Tables 4.5–4.8 with similar judgments for MORE.

[7] These predicates are conceived of as adjectives. However, as in many languages (Menon & Pancheva 2014 et seq.; Hanink et al. 2019), the definition for adjectives in ASL has not always been straightforward. Researchers have employed morphosyntactic and semantic diagnostics (gradability, property, etc.) to tell adjectives apart (Loos 2014; see also Padden 1988; MacLaughlin 1997; Bernath 2010). We use gradable predicate and adjective interchangeably.

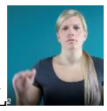
Item	1	2	3	4	5	6
BRUNO BEAT KARL HEAVY 20LB	✓ (w/HEAVY)	*	*	*	*	*
BRUNO BEAT KARL TALL 2-INCHES	✓ (w/TALL)	*	*	✓	*	~
BRUNO BEAT KARL OLD 5-YEARS	✓	*	*	*	*	*
BRUNO 20LB BEAT KARL HEAVY	*	*	*	*	*	~
BRUNO 2-INCH BEAT KARL TALL	*	*	*	✓	*	*
BRUNO 5-YEAR BEAT KARL OLD	*	*	*	*	*	*
TODAY 5-DEGREES BEAT YESTERDAY (HOT)	✓	*	*	~	*	✓
BRUNO BEAT KARL 20LB HEAVY	*	*	*	*	*	✓
BRUNO BEAT KARL 2-INCHES TALL	*	*	*	✓	~	✓
BRUNO BEAT KARL 5-YEARS OLD	*	*	*	*	*	✓
TODAY BEAT YESTERDAY 5-DEGREES HOT	*	*	*	✓	✓	✓
TODAY 5-DEGREES HOT BEAT YESTERDAY	*	~	*	*	✓	✓
TODAY HOT BEAT YESTERDAY 5-DEGREE	✓					

Table 1: Results for degree differential tests in ASL BEAT-construction (Kentner 2022: 149). ✓ = grammatical, ~ = marginal, * = ungrammatical, ? = unclear, & blank means missing data point.

(2012), Wilbur et al. (2018), Anouki (2019), Kenter (2020) and Rubio-Fernandez et al. (2022), and contains a wide variety of predicates differing both semantically and phonologically. They can be characterized in (i) scalar terms regarding the potential presence or absence of absolute endpoints ((9a) vs. (9k); Strickland et al. 2017); (ii) in iconic terms, as some may be more readily depictable than others ((9n) vs. (9l)); (iii) in terms of conceptual concreteness (Moltmann 2009) but also the ability of setting an object in space for a description, as is typical for non-abstract (Montefinese 2019) nouns ((9o) vs. (9m)); (iv) in terms of their locus for potential anaphoric retrieval ((9a) vs. (9f); Aristodemo & Geraci 2018); and (v) in terms of being symmetrically two-handed or not, which may create a phonological constraint on the production of the predicate ((9l); van der Hulst & van der Kooi 2021). They are articulated on various parts of the body ((9k) vs. (9l)) and disconnected from it. Some predicates were uttered in various forms but glossed here as the same item. An example of synonyms uttered by our consultants (but which do not show up in the relevant dictionaries) is represented in (9p) (vis-à-vis (9f)). Thus, we seek to

combine the subsets of data types offered elsewhere in the literature and compile their behavior in one place.[8]

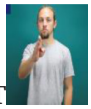
(9)

a. TALL  SHORT 

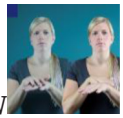
b. WIDE  NARROW 

c. HOT  COLD 

d. PRETTY  UGLY 

e. CURLY  STRAIGHT 

f. SMART  STUPID 

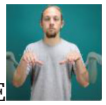
g. FAST  SLOW 

h. DRY  WET 

i. OLD  YOUNG 

j. CLOSED  OPEN 

k. FULL  EMPTY 

l. LAZY  ACTIVE 

m. CLEAN  DIRTY 

n. HEAVY  LIGHTWEIGHT 

o. DARK  CLEAR 

p. INTELLIGENT 

[8] While not our main focus, we also tested color terms. This was undertaken for three reasons. First, colors may be characterized as including or not including absolute endpoints (*black* vs. *green*; it has been further proposed that the standard is in the middle of the scale). However, cross-linguistically, the literature remains limited (Kennedy & McNally 2010; Menon & Pancheva 2019). Second, colors have been used as a diagnostic for the adjectival category in various languages, ASL included (Padden 1988; McLaughlin 1997; Bernath, 2010; Rubio-Fernandez et al. 2022). Third, color terms have a particularly uniform phonological import in ASL: most are typically uttered in the neutral spaces and are loan-initialized in that they may be described as having adopted the handshape of the letter they begin with in English, such as R for RED, P for PURPLE, etc. Finally, some vary in location: e.g. (i.b), but not (i.a) or (i.c), are mobile in space and, therefore, are in principle locatable along the vertical space. While colors are not discussed explicitly in this paper, across the entirety of the paradigm, they behave on par with other gradable predicates (9).

a. BLACK
b. GREEN/PURPLE
c. RED

The baseline cases are introduced in (10), illustrating some predicates from (9): (10a) contains OLD ((9i)); (10b) contains HEAVY ((9n)); (10c) contains TALL (9a), SMART (9f), and FAST (9g). A variety of nouns were used in elicitation (11): e.g., OUTSIDE  and LIQUID  (11a), ROAD  , and ANGLE  (11b), KID  in (10c) and (11c), and name signs for MARY (11c), JOE and PAUL (11d). As illustrated, different types of nominal expressions can be combined with gradable predicates, e.g., mass and count, singular and plural.

(10) a. 1-POSS GREAT-GRANDMOTHER OLD MAYBE 100 NOW
'My great-grandmother is old. Maybe 100 now.'

b. 1-POSS KID HEAVY PICK-UP$_{\text{br}}$ CAN'T
'My kid is heavy. I can't pick him up any more.'

c. REMEMBER KID BABY CRY+ + CONFUSE+ + + NOW TALL SMART FAST
'I remember this kid as a baby. Cried all the time. Confused a lot. Now she is tall, smart, fast!'

(11) a. OUTSIDE/LIQUID HOT
'The weather/liquid is hot.'

b. ROAD/ANGLE WIDE(.*increase*)[9]
'The road/angle was widened.'

c. KID/MARY$_{\text{br}}$ WOW NERVE SEE COOKIE GRAB EAT-UP FAST
'The kid/Mary has the nerve! Saw a cookie, grabbed it and gobbled it up. Fast.'

d. JOE *shift* PAUL BOTH LAZY
'Joe and Paul are both lazy.'

Below we discuss the diagnostics reported in the literature which probe for the presence or absence of degrees (Beck et al. 2004; Beck et al. 2009; Bochnak 2015; Bowler 2016; Deal & Hohaus 2019; Kapitonov 2019). We address cases building on the positive sentences (10). Section 4.1 discusses degree questions; section 4.2 addresses measure phrases. In section 5, we discuss different comparison strategies in ASL. Due to space limitations, we provide examples for two predicates: SMART (abstract, non-iconic, anaphorically non-retrievable, open-scale, one-handed, uttered on the head) and HEAVY (concrete, iconic, anaphorically-retrievable, open-scale, two-handed, uttered mid-torso); sometimes we also include examples with HOT and WIDE. Additional examples from other predicates are provided in the Appendix. This selection is done purposefully: SMART's counterpart in LIS (similar to its ASL's counterpart in the relevant respects) is addressed in Aristodemo and Geraci (2018). HEAVY has typically not been discussed

[9] We gloss the addition of what appears to be a manual modification on the predicate as *.increase*. See section 5.4.

in the literature on sign adjectives but is used in Kentner et al.'s (2020) stimuli, thus offering additional diagnostics for the same predicate.

4.1 Degree questions

The first diagnostic concerns degree questions. Typically, degree languages allow for questions that target a degree value (we assume that, in such languages, the *wh*-operator binds the degree variable within the gradable predicate). This results in questions like (12), which may be answered by indicating a value. In degreeless languages, this possibility is absent.

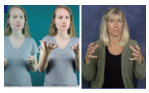
(12) How tall is Sue?

ASL allows a variety of positions for *wh*-elements: *wh*-in situ, D-linked *wh*-elements, *wh*-elements in initial position, *wh*-elements in final position, and *wh*-elements entirely omitted (Kelepir 2021). Many ASL signers, however, tend to prefer *wh*-items in final position, at least in mono-clausal cases (Sandler & Lillo-Martin 2006).[10] Additionally, non-manual markings (namely, brow lowering) are observed. Examples of *what* and *how* questions, and the corresponding images of the *wh*-items in ASL, appear in (13a,b). The quantity *how much* question appears in (13c,d).[11] (13) also shows variable word orders with *wh*-items. The WIGGLE (or QM), used in *yes/no*-question, occurs only clause-finally (13e).[12]

(13) a. _____bf
(WHAT) MARY DRINK WHAT
'What did Mary drink?'

b. _____bf
(HOW) MAKE HOW[12]
'How is this made?

c. _____bf
ARRIVE TIME HOW-MUCH
'How much time will it take to arrive?'



d. _____bf
ARRIVE HOW-MUCH TIME
'How much time will it take to arrive?'

[10] This may be due to the presence of focus structures or split-headedness in certain phrases (Lillo-Martin 2006; Quer et al. 2021). This is orthogonal to our discussion.

[11] Note, as has been pointed out to us, that HOW in ASL tends to function as an adverbial with a process interpretation only (13b). Instead, HOW-MUCH elicits quantity (13c,d) (see Kuhn et al. 2022).

[12] ASL SignBank states that HOW appears in type and manner questions only (https://aslsignbank.haskins.yale.edu/dictionary/gloss/487.html); thus, it is unexpected in a degree-modificational environment. However, given the lack of comprehensive examination on the matter, we include it. Furthermore, Kenter records a possibility of HOW as a degree-probing question (Kentner 2020: 145), which runs counter the intuition of our consultants, current dictionaries and similar materials, and an anonymous reviewer. This suggests that perhaps language variation is at play. See Lindeberg (2022).

e. ____bf
KID SMART WIGGLE
‘Is this kid smart?’

While several configurations were attempted in elicitation, we report *wh*-final cases, the more general strategy in question formation in ASL which comes with an existential presupposition (Abner 2011). To exemplify the variety of attempts, we offer all possible word orders (14). Succinctly put, degree questions with an adjective and the relevant *wh*-items do not arise.

(14) a. ____bf
*(a-IX) BOOK HEAVY WHAT/HOW/HOW MUCH
b. ____bf
*(a-IX) HEAVY BOOK WHAT/HOW/HOW MUCH
c. ____bf
*WHAT/HOW/HOW MUCH (a-IX) BOOK HEAVY
d. ____bf
*WHAT/HOW/HOW MUCH (a-IX) HEAVY BOOK
‘How heavy is this book?’
e. ____bf
a-IX BOOK WEIGHT WHAT/HOW/HOW MUCH
‘What is the weight of this book?

Due to space limitations (and in line with our consultants’ preference), (15) records only the *wh*-final option; across the variety of environments, the predicates in (9) pattern with (15)–(16).

(15) a. ____bf
*ANGLE WIDE WHAT/HOW/HOW MUCH
‘How wide is this angle?’
b. ____bf
ANGLE MEASURE WHAT
‘What is the measure of this angle?’

(16) a. ____br/bf
*KID SMART WHAT/HOW/HOW-MUCH
‘How smart is this child?’
b. ____bf
KID SMART WIGGLE
‘Is this kid smart?’ (13e)

(14)–(16) show that a content question may be asked of a noun property (15b), but not of its adjectival counterpart ((15a), (16a)). Note that (16b) contains WIGGLE, commonly associated with a *yes/no*-question—according to our consultants, one must check the veridicality of the statement in lieu of enquiring about the extent of smartness.

Irrespective of whether a *wh*-word appears (15) or not (16), whether a *wh*-question interpretation arises (via contextual cues) or not (see the Appendix), one thing remains constant: it is impossible to ask *how(-much)* questions with the relevant *wh*-elements, although such

questions are common in languages that allow them. While this is not surprising in a degreeless approach, it poses a problem for the alternative view which targets degree variables.[13,14]

4.2 Measure phrases

Another test taken as evidence for the potential presence of degree variables regards the availability of measure phrases in sentences with gradable predicates. This is illustrated for English (17): *1.8 m* indicates the value corresponding to Maria's height.

(17) Maria is 1.8 m tall.

In degree approaches, measure phrases provide a value to the degree representing the individual's height. In contrast, the absence of measure phrases can be accommodated under a degreeless approach, as there is no room for degree expressions combining with an adjective (there are no degrees to which measure phrases would give a value). Not all languages, or even all adjectives in the same language, allow measure phrases, even if the adjective appears to be compatible with such a phrase. Previous research, focusing on degree languages, has appealed to (non-)neutrality of the adjective (see English (18a) vs. (18b,c)) as well as certain syntactic facts, e.g., the possibility of *for N* insertion, and adjective modification in attributive vs. predicative positions (see Dutch (19)) (Doetjes 2012).[15]

(18) a. John is 1.50 m tall.
b. #John is 1.50 m short.
c. #The locket is 250€ expensive.
d. #The locket is 250€ cheap.
(Doetjes 2012: 197)

(19) a. Mhet 20 cm ondiepe water[16] *attributive*
the 20 cm shallow water
b. #Het water is 20 centimeter ondiep *predicative*
'the water is 20 centimeters shallow'
(Doetjes 2012: 201)

[13] Measure phrases and degree questions test for Beck et al.'s (2009) DegPP; their absence doesn't entail an absence of degrees overall.

[14] Sentences with TALL and OLD are commonly found in the ASL literature. These predicates behave like HEAVY and HOT. See the Appendix.

[15] Several proposals can account for these facts: Schwarzschild's (2005) Homonym Rule and Winter's (2005) Triviality Filter, a.o.

[16] The M symbol indicates the combination of a non-neutral adjective and a measure phrase; this is stylistically marked when compared to the neutral counterpart (Doetjes 2012: 201).

However, as (20)–(21) show, irrespective of the distinctions above (see the Appendix), it is impossible to combine a gradable predicate with a measure phrase.

(20) a. _____bf
BOOK (IX) 4 KILO. TRUE HEAVY. NOT 1-POSS
'The book is 4 kilos. It is really heavy.'
b. *_____bf
BOOK (IX) 4 KILO HEAVY NOT 1-POSS *attributive*
b'. *_____bf
BOOK (IX) HEAVY 4 KILO NOT 1-POSS
'That 4 kilo heavy book—not mine.'
c. * GO STORE BUY ONE BOOK 4 KILO HEAVY *predicative*
c'. * GO STORE BUY ONE BOOK HEAVY 4 KILO
'I went to a store and bought a book that weighs 4 kilos.'

(21) a. _____bf
LIQUID a-IX HOT. 100 DEG C IMPOSSIBLE
'This liquid is hot! But it can't be 100°.'
b. * _____bf
(IX) LIQUID 100 DEG HOT BOIL IMPOSSIBLE *attributive*
b'. * _____bf
(IX) LIQUID HOT 100 DEG BOIL IMPOSSIBLE
'That this 100° hot liquid would boil is not possible.'
c. *_____bf
LIQUID a-IX BOIL ASSUME 100 DEG HOT *predicative*
c'. *LIQUID a-IXbf BOIL ASSUME HOT 100 DEG
'This liquid is bubbling. I assume it is 100° hot.'

The (a) examples include measure expressions, showing that, in principle, they may surface in ASL. However, as the (b)–(b') and (c)–(c') cases show, it is ungrammatical to include measure phrases as adjective modifiers. The ASL adjectives are insensitive to the distinctions in (degree) languages (18)–(19): all predicates display uniform behavior.[17] As with degree questions, these data can be accommodated under a degreeless approach: there is no room for combining measure expressions.

This section thus suggests that ASL may be understood as a degreeless language. The next section discusses further cases to strengthen our position that ASL is a degreeless language.

5 Comparison strategies

The discussion suggests that there is no need to assume degrees to analyze gradable predicates in ASL. We turn to other tests that have been utilized to argue for the presence or absence of degree variables in the relevant sense, focusing on comparatives and on one (apparent) equative. These are relevant to the issue of presence/absence of degrees, since, as discussed in section 3, a

[17] As with questions (13)–(16), a variety of word orders were attempted, especially within the NP.

comparative morpheme (or an equative) brings degrees to the foreground in that two values are considered. The absence of such markers when establishing comparisons begs the question as to how to analyze such constructions.

As documented in Kentner (2020), in ASL gradable predicates may appear in constructions that include (i) no overt comparative marking, where the relevant interpretation arises via cues in discourse (juxtaposition) (22); (ii) the comparative depiction of the two entities under consideration (23);[18] (iii) an overt lexical item like MORE, WORSE, BETTER, BEAT or SAME(AS) (24); and (iv) a non-manual (so-called) intensification marker, which may involve puffing the cheeks, widening the eyes, a body lean, or increasing the associated space of the manual sign (Wilbur et al. 2012; Wilbur 2021) (25). ASL thus allows for different comparison strategies, which may (not) involve dedicated morphological means.[19]

(22) a. MARIA OLD 25 BROTHER 10
Lit. 'Maria is 25 years old; her brother is 10 years old.'
(≈ 'Maria is older than her brother.')

b. HAIR left-hand-a-MARY CURLY right-hand-PAUL STRAIGHT
'Mary's hair is curly; Paul's hair is straight.' (≈ 'Mary's hair is curlier than Paul's.')

c. TRAIN A a-$CL_{vehicle}$b 100 KPH TRAIN B b-$CL_{vehicle}$a B IXb 150KPH
Lit. 'Train A moves 100 kph; train B moves 150 kph.'
(≈ 'Train B is faster than train A.')

d. HOUSE A TALL_1[20] SIX METER. HOUSE B TALL_1 THREE METERS.
Lit. 'House A is 6 m tall; house B is 3 m tall.' (≈ 'House A is taller than house B.')

e. LIQUID A 90 DEG LIQUID B 45DEG
Lit. 'Liquid A is 90 degrees; liquid B is 45 degrees.'
(≈ 'Liquid A is hotter than liquid B.)

(23) a. ALEX a-IX TALL*(neutral-space)* JO b-IX TALL*(at-signer'-head)*
Lit. 'Alex is this tall, Jo is this tall.' (≈ 'Jo is taller than Alex.')

(24)

a. JILL SMART JANE BETTER 
Lit. 'Jill is smart; Jane is better (i.e., smarter).' (≈ 'Jill is smarter than Jane.')

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[18] According to our consultants, (22)–(23) are the most common and intuitive comparison strategies in ASL.

[19] A variety of options (synthetic, analytic, juxtaposed, non-manual only) is represented here: https://www.youtube.com/watch?v=svfZBLamHuQ&list=PL60GgJ-A96ix_5YaoxuZYSPljrrGbs_H6&index=17.

[20] See the sign for TALL_1 in (22d) here: https://aslsignbank.haskins.yale.edu/dictionary/gloss/1174.html.

b. COMEDIAN aIX FUNNY bIX WORSE 
Lit. 'Comedian B is worse (i.e., worse at being funny) than Comedian A.'[21]
(≈ 'Comedian B is funnier than Comedian A.')

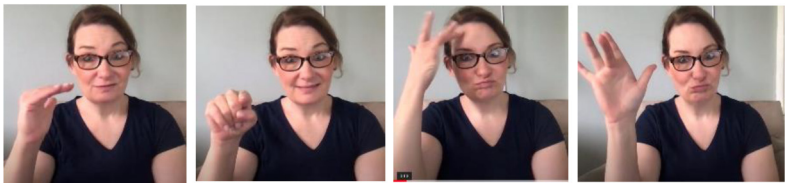
c. MARY HEAVY PAUL BEAT 
Lit. 'Mary beats Paul at being heavy.' (≈ 'Mary is heavier than Paul.')

d. MARY PAUL WEIGHT IX_{Mary} HEAVY MORE 
Lit. 'As for Mary and Paul's weight… She_{Mary} is heavier.'
(≈ 'Mary is heavier than Paul.')

d'. MARY WEIGHT IX_{Mary} HEAVY MORE THAN PAUL
Lit. 'As for Mary and Paul's weight… She_{Mary} is heavier.'
(≈ 'Mary is heavier than Paul.')

e. MARY a-IX TALL JANE a-IX TALL a-SAME-b. 
'Mary and Jane are similarly tall.'

(25) a-PERSON a-IX SMART----------



PERSON b-IX $\overline{\text{SMART}}^{intens}$----------

Lit. 'Person A is smart; Person B is much smarter.' (≈ 'B is smarter than A.')

[21] The interpretation produced by the English version has a negative implication. This is not necessarily so in ASL, as shown in the free translation. What (24a–c) suggest is that each lexical item should be investigated thoroughly.

We discuss these strategies in connection with the diagnostics that probe the presence of degrees. In 5.1–5.2, we address juxtaposition (22) and overt lexical items (24), by focusing on crisp judgments and comparison involving measure phrases.[22,23] Section 5.3 discusses SAME(AS). We show that different comparison strategies display different properties, but measure phrases are always disallowed. We discuss ***.intens*** in section 5.4.

5.1 Crisp judgments

Crisp judgments involve the possibility of making nuanced distinctions when comparing individuals (Kennedy 2007). In such contexts, implicit comparative strategies (e.g., juxtaposition) are normally infelicitous. What, in contrast, is compatible with such situations is explicit comparison strategies (e.g., containing overt comparative morphemes). (26) illustrates this in English: (26b), an explicit comparison case, may be uttered in a context where Mary is taller than Sue by just a couple of centimeters. In such an environment, (26a) is infelicitous.

(26) a. Compared to Sue, Mary is tall. *implicit comparison*
b. Mary is taller than Sue. *explicit comparison*

While this test is not conclusive for the degree vs. degreeless debate, we apply it because it allows us to tease apart comparison strategies in ASL in more detail. Crisp judgments demonstrate that in juxtaposition (the (a) cases in (27)–(28)), nuanced distinctions are impossible, revealing implicit comparison. In contrast, crisp judgments are possible in the (b) cases in (27)–(28), with overt lexical items (MORE, BEAT). As elsewhere, all the predicates in (9) behave identically (see the Appendix).

(27) *Context:* Book A is 4 kilo. Book B is 4 kilo1gr.
a. #BOOK A a-IX TRUE a-HEAVY BOOK B b-IX LIGHT-WEIGHT
Lit. 'Book A is truly heavy; book B is light weight.
(≈ 'Book A is heavier than book B.)'
b. BOOK A a-IX 4 K-I-L-O BOOK B b-IX 4 KILO 1 OZ b-IX MORE/b-BEAT-a
'Book A weighs 4 kilos; book B weighs 4 kilos 1 ounce. Book B is heavier./Book B beats book A at being heavy.'

[22] Missing among the options in (24) is the synthetic morpheme (Aristodemo & Geraci 2018), glossed elsewhere as .COMP (e.g., Wilbur et al. 2018), which is applicable only to certain predicates (e.g. TALL). We address it separately in section 5.4.

[23] Due to space constraints, we focus on a subset of the overt comparative morphemes: MORE and BEAT (24c,d,d'). ASL allows at least two different linguistic contexts associated with overt morphemes: the first one represented in (24d) and discussed in section 5.2, and the second involving a pivot THAN (24d'). The latter is discussed in Kentner (2020: 134). In our elicitation, both options were considered, with all consultants independently stating that (24d') was contact-induced and "felt English-like." We exclude these from the final paradigm until a more dedicated study of the relevant phenomena is undertaken (Lindeberg 2022).

(28) *Context:* Child A is Einstein. Child B is Stephen Hawking. While both are very smart, suppose that Hawking is a bit smarter.

a. #H-A-W-K-I-N-G a-IX SMART E-I-N-S-T-E-I-N NOT/STUPID
Lit. 'Hawking is smart; Einstein is not/is stupid.'
(≈ 'Hawking is smarter than Einstein.')

b. H-A-W-K-I-N-G a-IX SMART E-I-N-S-T-E-I-N b-IX SMART a-IX MORE SMART/a-BEAT-b
'Hawking is smart; Einstein is smart. Hawking is smarter than Einstein/Hawking beats Einstein at being smart.'

The data in (27)–(28) offer two conclusions: the (b) cases illustrate nuanced distinctions/crisp judgments and, therefore, corroborate the suggestion in the literature that (24), containing overt lexical items typically associated with comparison, actually involves explicit comparison (Wilbur et al. 2018; Kentner 2020). While implicit and explicit comparisons can be captured in degree and degreeless approaches, the next diagnostics suggest that a degreeless approach is more appropriate.

5.2 Differential measure phrases

Building on section 4.2, this section discusses measure phrases, which become particularly relevant when discussing comparatives. The relevant diagnostic involves differential measurements (von Stechow 1984), where the measurement corresponds to the difference between the values for two individuals in some property. (29) illustrates this: *1 cm* is the phrase that indicates the difference in height between Mary and Sue.

(29) Mary is 1 cm taller than Sue.

This test distinguishes degree vs. degreeless languages (Deal & Hohaus 2019; Martínez Vera 2021a). In a degree approach, the possibility of such phrases arises because the value difference between degrees can be computed directly; measure phrases target this difference (Kennedy 2007). In a degreeless approach, there are no units to determine such a difference. (30)–(31) include elicitation data showing that adjoining differential measure phrases in these constructions is ungrammatical. This provides strong support to the claim that ASL gradable predicates do not introduce degree variables.[24]

(30) a. BOOK A a-IX TRUE a-HEAVY 7LB BOOK B b-IX LIGHT. 5LB
Lit. 'Book A is truly heavy book, it weighs 7 pounds. Book B is light, it weighs 5 pounds.' (≈ 'Book A is heavier than book B; the weight of book B is 5 pounds.'
NOT: 'The difference between the weights of books A and B is 5 pounds.')

[24] Previous literature offers only inconclusive data (see sections 4 and 6). Kentner (2020) tries out several word-order possibilities with the same inconclusive results (see, e.g., her tables 4.4–4.8 on pp. 113–114). After careful manipulation across various syntactic contexts, we find that no matter the word-order, differential measure phrases are ungrammatical for our consultants across predicates. See the Appendix for additional examples.

a'. *BOOK A a-IX TRUE a-HEAVY BOOK B b-IX LIGHT 2 LB
Lit. 'Book A is truly heavy; book B is light. 2 pounds (difference).'
(≈ 'Book A is 2 pounds heavier than Book B.')

b. MARY PAUL WEIGHT IX_{Mary} HEAVY MORE. 4 LB
'When you compare Mary's and Paul's weight, Mary is heavier; 4 pounds.'
(≈ 'Mary is heavier than Paul; the weight of Mary is 4 pounds.'
NOT: 'The difference between the weights of Mary and Paul is 4 pounds.')

b'. *MARY PAUL WEIGHT IX_{Mary} HEAVY MORE 4 LB
'Mary is 4 pounds heavier than Paul.'

(31) a. LIQUID a-IX HOT b-IX NOT 5 DEG
Lit. 'Liquid A is hot. Liquid B is not; 5 degrees.'
(≈ 'Liquid A is hotter than liquid B; the temperature of liquid A is 5 degrees.
NOT: 'Liquid A is 5 degrees hotter than liquid B.')

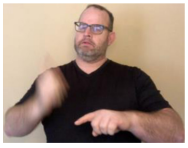
b. *LIQUID a-IX HOT 90 DEG bIX 85 DEG TRUE HOT a-BEAT-b 5 DEG
'Liquid A is hot, 90 deg; liquid B is also/really hot, 85 deg. Liquid A is hotter by 5 degrees.'

b'. *LIQUID TWO a-IX b-IX HOT b-IX

a-IX b-IX WOW b-IX HOT b-IX 5 b-IX

DEGREE INCREASE HOT a-IX

CAN'T



'It can't be that liquid A is 5 degrees hotter than liquid B.'

The (a) cases, illustrating juxtaposition (implicit comparison (22)), are entirely incompatible with differential measure phrases. Crucially, explicit comparison with overt lexical items (24) is also incompatible here (30b,b')–(31b). These findings are consistent with a degreeless approach (i.e., our findings do not replicate the variability in **Table 1**). Furthermore, the crisp judgment data (section 5.1) should thus be captured in a degreeless approach.

5.3 SAME/SAME(AS): a non-equative

As discussed by Rett (2020) (see also Rett 2013; Hanink 2018; Wellwood 2019), in addition to measure phrases in comparatives, equatives may also serve as a diagnostic to determine the presence of degrees, since, especially if they are explicitly marked, they may involve the comparison of two degrees, just like the comparative. We therefore address SAME (and its variants), typically translated as 'same, be same as' and 'as… as' (see (24e) and **Figure 1**) but also as 'alike, similar, and suggest that it does not behave like an equative—it is a similative that does not involve degrees.[25,26]

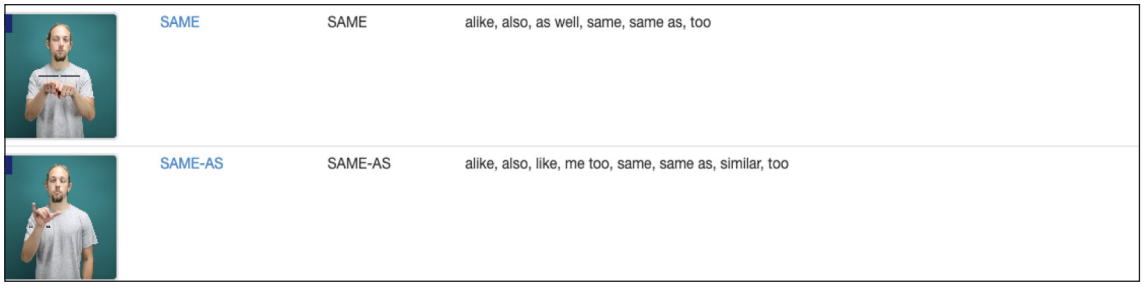


Figure 1: SAME and SAME-AS (ASLBank).

The relevance of SAME lies in the idea that *same* words have been analyzed as markers of equative constructions that occupy a degree projection and the related syntactic head (Hanink 2018).

Rett (2020) classifies equatives as predicatives (32d) and non-predicatives (32a–c), with the latter being explicit (32a) or implicit (32b). Relevant here are explicit equatives (32a), which rely on degrees; they are compatible with strong *equal*- and weak *at least*-interpretations. Thus,

[25] We thank an anonymous reviewer for suggesting this to us.

[26] There is limited research on SAME, focusing only on its syntactic properties. Specifically, Koulidobrova (2017), following Lillo-Martin (1995), argues that SAME in ASL signals VP ellipsis which elicits a quantificational interpretation, where Jeff built a different set of houses:

(i) a-PETER BUILD a-POSS/THREE HOUSE b-JEFF WILL SAME
'Peter has built his/the houses; Jeff will do the same.'
(Koulidobrova 2017, (37))

(32a) is felicitously uttered against contexts (33a,b), which target the strong (33a) and weak (33b) interpretations, but, importantly, cannot be uttered against (33c), where the standard exceeds the value of the comparee. In turn, (32d) only allows the strong interpretation (33a), whereas (32b,c) are also felicitously uttered against (33b,c) (these are implicit equatives).

(32)	a.	Jane is as tall as Bill.	*P(redicate) M(arker) equative*
	b.	Jane is tall like Bill.	*S(tandard M(arker)-only equative*
	c.	Jane is tall; Bill is tall (too).	*conjoined equative*
	d.	Jane equals Bill in height.	*predicate equation*
		(Rett 2020, (50))	

(33) a. Context 1: Jane is 5'7" and Bill is 5'7"
b. Context 2: Jane is 5'7" and Bill is 5'5"
c. Context 3: Jane is 5'5" and Bill is 5'7"

The key is to determine whether SAME in ASL behaves like an explicit equative (32a), (allowing strong *equal-* and weak *at least*-interpretations) and, thus, necessitating degrees. The answer is negative. (34a–c) demonstrate that, irrespective of word order, SAME can be uttered against all contexts in (35); it thus suffices that the two individuals under consideration are (simply) similar, regardless of which individual has more of the relevant property. SAME is thus not an explicit equative, which further means that there are no grounds to postulate degrees for ASL based on it.

(34) a. BOOK A a-IX HEAVY BOOK B b-HEAVY SAME/a-SAME-b
b. BOOK A a-IX BOOK B b-IX b-HEAVY SAME/a-SAME-b
c. BOOK A a-IX BOOK B b-IX b-HEAVY SAME HEAVY
'Book A is like book B in terms of heaviness.'

(35) a. Context 1: Book A is 20 and book B is 20oz.
b. Context 2: Book A is 25oz and book B is 20oz.
c. Context 3: Book A is 20oz and book B is 25oz.

Instead, we suggest that SAME (and SAME(AS)) behaves more akin to a similative, which does not involve degrees—SAME being glossed as English *same* is merely a rough approximation with no theoretical status (see, e.g., Hanink 2018 for discussion of English *same*). In her overview of what similatives (vs. equatives) can(not) mean, Rett (2013) notes that, at least in English, in addition to the interpretations (36a,b), similatives receive interpretations as in (36c,d):

(36)	a.	A stinks as B.	*intensifier*
	b.	A is as white as snow.	*generic equative*
	c.	A danced as B did.	*manner*
	d.	A danced as B sang.	*Time*

Examples (36a–c) are felicitous if the relevant properties hold to a similar or the same extent. (36a) can be uttered felicitously if A and B smell the same or about the same; (36b) is uttered felicitously if the color under discussion is exactly like that of snow or similar to it; (36c) is uttered felicitously if the individuals dance exactly the same or about the same. In contrast, (36c) only allows the interpretation where the dancing and the singing happen at the very same time.

The key question is what properties SAME (and its variants) display. Interestingly, these require that the similarity interpretation be available—the equality interpretation is also possible here. Crucially, if the equality interpretation (involving time) is the only one available (37d), SAME(AS) cannot be used—instead, a different item, SIMULTANEOUS is required. Thus, in line with the intuitions of signers, who often translate this lexical item as 'similar,' we conclude that SAME is a similative (not an explicit equative), so it makes no reference to degrees.

(37) a. *Context 1:* A and B of them smell awful. One smells as much as the other.
Context 2: A and B of them smell awful. A smells worse than B.
A a-IX STINK B b-IX STINK SAME(AS)
'A stinks as B.'

b. *Context 1:* Someone is getting married in a white dress. So white! Color of snow.
Context 2: Someone is getting married in a white dress. The tone is similar to snow.
DRESS 1-IX COLOR WHITE SAME(AS) SNOW
'The dress is white as snow.'

c. *Context 1:* A danced badly; B danced badly.
Context 2: A danced slowly; B danced slowly to match A.
B b-IX DANCE A a-IX DANCE SAME(AS))/SAME(STAY)
'A danced the same as B did.'

d. *Context:* At 9:00am, A is dancing and B is playing a guitar
B b-IX PLAY-GUITAR A a-IX DANCE SIMULTANEOUS/#SAME(AS)
'B played the guitar as A danced.'

Until further research, we suggest that ASL employs non-predicative implicit equatives in a strategy involving juxtaposition—this is in line with juxtaposition being the most common strategy to express comparison in ASL (section 4). Interestingly, Rett (2013) indicates that implicit equatives display two properties: they are evaluative (the norm need be equalled or exceeded) and unmodifiable (adjoining a factor modifier like *twice* or *half* is not possible). This is what we find in ASL.[27]

[27] Having discussed that SAME (and its variants) are better analyzed as similatives, a question remains regarding their status in comparison constructions. Arguably, learning about (and having a lexical item for) a similative, vis-à-vis an explicit comparative or equative, is expected to trigger a different acquisitional trajectory. We might expect that, in spontaneous production, a similative is completely dissociated from a comparative. This is what we report in Koulidobrova & Martínez Vera (2021) and Koulidobrova et al. (2022).

(38) a. BOOK A HEAVY BOOK B HEAVY (SAME) #BUT LIGHTWEIGHT
'Book A is heavy; book B is heavy (too), but book A is lightweight.'
b. *BOOK A TWICE HEAVY BOOK B (SAME)
'Book A is twice heavy; book B is heavy (too).'

While more research on these constructions is in order, what is clear is that SAME(AS) does not behave as a bona fide equative, which involves degrees. Instead, the data remain consistent with the degreeless approach to gradable adjectives adopted in this paper.

5.4 Comparative depiction/demonstration

We have shown that a degreeless approach can readily accommodate juxtaposition (22) and lexical comparison (24) (including cases with SAME). One question arises: why do some predicates (like TALL (39)) are still used when discussing gradability and appear to behave in a manner suggesting visible scales (https://www.youtube.com/watch?v=vGh12x58hoI&list=PL60GgJ-A96ix_5YaoxuZYSPljrrGbs_H6&index=37)? Consider the appeal of this property in (40).

(39) a. ALEX a-IX TALL*(neutral-space)* JO b-IX TALL*(at-signer'-head)* =(23)
Lit. 'Alex is this tall, Jo is this tall.' (≈ 'Jo is taller than Alex.')

(40) a. *Iconic degree scale* (Aristodemo & Geraci 2018, (36))
An iconic scale is the order-preserving mapping of a set of ordered degrees onto a set of ordered points in the signing space (i.e., a line on the horizontal, vertical or lateral plane). Each degree of the scale is represented as a point along a line.
b. *The Visibility Hypothesis* (Wilbur et al. 2012, (10))
Sign languages express the boundaries of semantic scales by means of phonological mapping.

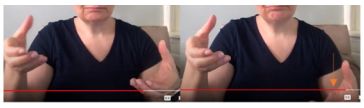
(40) means that if degrees are directly perceived, they should be retrievable (as the perception literature suggests, e.g., Corina et al. 2014).[28] For Aristodemo & Geraci (2018), the potential mappability of the predicate in space for its anaphoric retrieval is thus revealed. Key is whether a predicate introduces an anaphorically retrievable area of space along the scale (40a) (we represent this as [±locus]): if a gradable predicate is [+locus], the comparative counterpart thereof contains a synthetic morpheme (adjective.COMP; see footnote 22); if the predicate is [–locus], its comparative counterpart would be analytic (adjective + MORE/BEAT). Following this reasoning, the data here can be described as follows: TALL, WIDE, LARGE, HEAVY are [+locus] and SMART, LAZY, FAST are [–locus]. Thus, the comparative cases for TALL, WIDE, LARGE, HEAVY are expected to be modified by a bound comparative morpheme only, while SMART, LAZY, FAST would be modified by a free one.

[28] In Corina et al.'s (2014) study, (near-)native signers would outperform non-native and naive signers on such a task.

Yet, this approach does not capture the facts. Consider HEAVY  ([+locus]), which, according to Aristodemo & Geraci (2018), is predicted to allow a synthetic comparative form only. As with *upward.movement* in TALL (39), the *downward.movement* of the relevant hand in HEAVY in the context of crisp judgments indicates explicit comparison (we offer two options in (41a) for illustration). However, another strategy, not predicted by Aristodemo & Geraci, is also possible: a free-standing comparative morpheme (41a'–b). This is particularly striking with TALL in (39) and (41b)—the crux of Aristodemo & Geraci (2018).

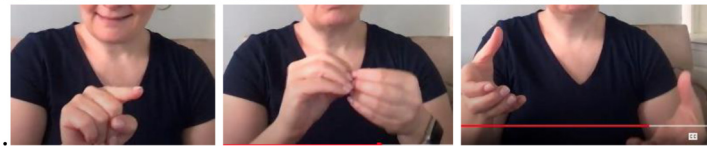
(41) BOOK A a-IX 4 KILO BOOK B b-IX 4 KILO 1 OZ…
'Book A weighs 4 kilos; book B weighs 4 kilos 1 ounce…

a. …a-IX HEAVY b-IX HEAVY*(minimal downward movement)*
…Book B is heavier.'

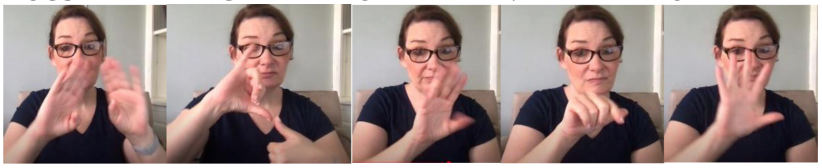
Option 1: 

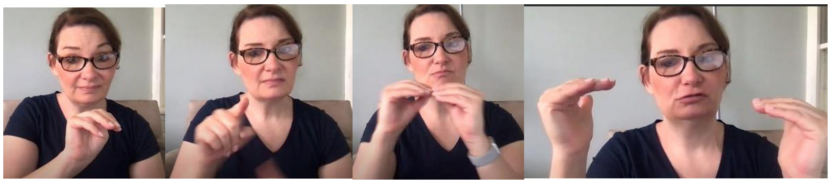
Option 2: 

a'. …b-IX MORE/b-BEAT-a
…Book B is heavier./Book B beats book A at being heavy.'

a". …b-IX MORE a- HEAVY-b
… 
…Book B is heavier.'

b. HOUSE a-IX 6 METER b-IX


HOUSE HEIGHT 5 . 5


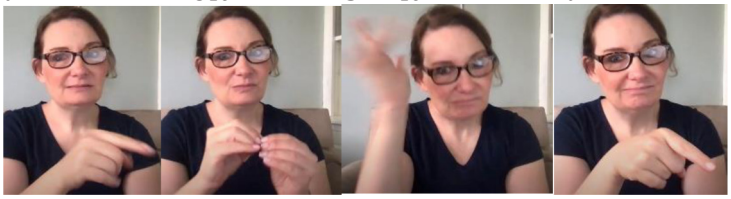
METER a-IX MORE a-TALL-b


'This house is 6m; that house is 5.5m. When I compare the height, this one is taller.'

Second, consider SMART, which should not be able to be modified in the same manner as TALL and HEAVY (as argued for in Aristodemo & Geraci 2018). Yet, as (42) shows, when comparing Einstein and Hawking, both overt MORE (42a) and the intensification (42b) of the predicate (see below in this section for more details about intensification) are possible.

(42) *Context:* Child A is Einstein. Child B is Stephen Hawking. While both are very smart, suppose that Hawking is a bit smarter.

a. a-IX MORE SMART a-IX =(28)



b. a-PERSON a-IX SMART =(25)

intens

PERSON b-IX SMART

Lit. 'Person A is smart; person B is much smarter.' (≈ 'B is smarter than A.')

Other predicates, such as FAST  ([–locus]) behave similarly.

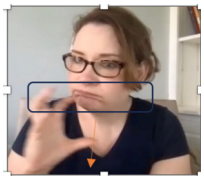
(43) CAR A a-IX M-U-S-T-A-N-G 250 ML CAR b-IX C-O-R-V-ET-T-E 260…
'Car A is a mustang, it goes 250 miles; car B is a corvette, it goes 260…
a. …a-IX FAST b-IX FAST*(minimal.path.change)*
…B is faster.'
b. …b-IX MORE/b-BEAT-a
…car B beats car A at being fast.'

In fact, every predicate in (9), irrespective of the potential access to the iconic scale (40), is compatible with at least two comparative strategies, one of which is an addition of the overt lexical item, e.g., MORE or BEAT.

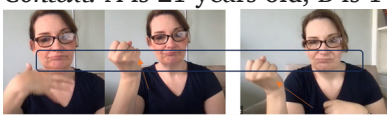
Finally, even with predicates that can potentially be moved along the line represented by (40a), something else may potentially contribute to the relevant interpretation: (44) shows that something besides the manual component (indicated using arrows) can differentiate various

possibilities concerning gradability in ASL—namely, non-manuals (note the differences in the rectangles).

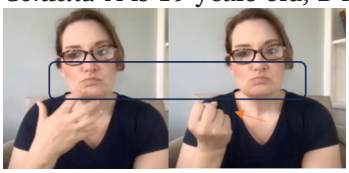
(44) a. *Context:* A and B are very old.



b. *Context:* A is 21 years old, B is 14 years old; A is 50 years old, B is 25 years old.



c. *Context:* A is 19 years old; B is 20 years old. *Crisp judgment*



In other words, given that measure and differential phrases (sections 4.2, 5.2) are not possible, the data suggest that Aristodemo & Geraci's approach to LIS does not capture the ASL data straightforwardly, thus casting doubt on the alleged universality for sign languages. That said, depiction may play a role in the analysis after all; however, such an analysis need not include degrees. Below we discuss a potential direction in this regard.

Davidson (2015; 2021) argues that depiction/demonstration[29] directly represents how some property applies to the two relevant individuals in the signing space. This view suggests approaching certain predicates as degree demonstratives, i.e., expressions like *this big* or *yea tall*. Previous research indicates that these expressions are directly referential. Unlike standard demonstratives, they are best analyzed in terms of similarity between the target of the demonstration gesture and the referent of the linguistic phrase. While a variety of mechanisms can capture this phenomenon, none require degrees (despite the name), for they do not involve degree comparison (König & Umbach 2018; Ramchand 2019; Umbach & Gust 2021).[30]

[29] We set this distinction aside for simplicity.

[30] This approach to TALL, HEAVY or WIDE would amount to something like *this tall/heavy/wide*, where the predicate and the demonstrative combine (Davidson 2021). However, in cases that cannot be directly depicted/demonstrated, like SMART, LAZY or FAST, this should be impossible. Thus, a non-degree approach to the difference between the two types of predicates (one that is contingent on depiction/demonstration instead) remains more parsimonious.

To end this section, we consider another possible form of depiction/demonstration—namely, what has been labeled 'intensity', 'intensification' and *.intens* (25). This strategy involves a manual (de-)acceleration, an overall increase in tension of the articulators, movement modifications, enlarged or reduced trajectory, delayed release of the movement, non-manual modifications in the face, head, and torso, and a variety of non-manuals (puffed cheeks, squinted eyes, brow raise), etc. (Padden 1983; Wilbur et al. 2012; Loos 2014; Kentner 2020; Schlenker & Lamberton 2021). Following previous literature in setting aside these differences, we adopt *.intens* as a glossing convention. As indicated in footnote 9, we also gloss the addition of what appears to be a manual modification on the predicate as *.increase*.

(45) illustrates different kinds of predicates (we include some examples in still-shots). All cases are alike. Here *.increase* is understood as follows: for predicates like LAZY and INTELLIGENT, this results in actual increase in size of the produced predicate; for predicates like DENSE, the opposite happens, which depicts the increase in density (reducing the size of the depicted object). This is related to the lexical semantics of the predicate—its iconicity or meaning transparency (Sevcikova Sehyr & Emmorey 2019). The data in (45) indicate that, like other comparison strategies, cases with *.intens* produce the relevant target interpretation; this is particularly evident with (45d), where *.intens* is the only element indicating comparison. Furthermore, *.intens* is applicable across predicate types (45a–e) (e.g., it is not sensitive to [±locus]). This is important, since degreeless languages display the same modification possibilities across predicates (Bochnak 2015). Furthermore, *.intens* can co-occur with another comparative strategy (45a–c,e) or, as indicated, be the only element in the utterance signaling comparison (45d).

(45) a. a-IX a-TALL/a-WIDE/a-LARGE/a-OLD
b-IX b-TALL.*increase* /b-WIDE.*increase*/b-LARGE.*increase*/b-OLD.*increase* (*intens*)
Lit. 'A is tall/wide/large; B is taller/wider/larger.'
(≈ B is taller/wider/larger than A.')

b. a-IX a-LAZY b-IX b-LAZY.*increase* (*intens*)
Lit. 'A is lazy; B is lazier.' (≈ B is lazier than A.')

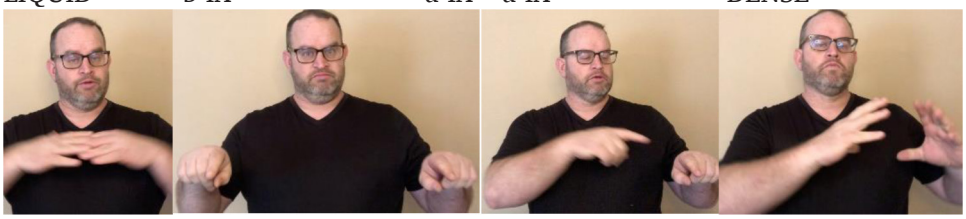
c. PERSON a-IX INTELLIGENT b-IX

PERSON b-IX $\overline{\text{b-INTELLIGENT.}increase}^{intens}$

Lit. ‘A is intelligent; B is more intelligent.’ (≈ B is more intelligent than A.’)

d. a-IX FAST/a-SMART b-IX $\overline{\text{FAST/b-SMART}}^{intens}$
Lit. ‘A is fast/smart and B is faster/smarter’ (≈ B is faster/smarter than A.’)

e. LIQUID b-IX a-IX a-IX DENSE



b-IX $\overline{\text{b-DENSE.}increase}^{intens}$

Lit. ‘Liquid A is dense; liquid B is denser.’ (≈ ‘B is denser than A.’)

While *.intens* is also a depictive strategy, its semantics needs to be carefully considered (Davidson 2015 et seq.); this task lies outside our goals. Initial work by Kentner (2020) argues that *.intens* is not a comparative morpheme. Thus, aside from being able to co-occur with another comparative morpheme (45a–c), sentences with *.intens* disallow crisp judgements: (46a) is unacceptable if car B drives 1/2 mph faster than car A; other depictives under *.intens* only may be impossible (47). Therefore, *.intens* does not behave as a bona fide explicit comparison strategy. Kentner suggests that *.intens* behaves like English *very*. This analogy, however, cannot be strict: *.intens* offers possibilities that *very* and its cross-linguistic counterparts do not. For instance, it does not represent the endpoint in the scale of the predicate, as the parallel data from Japanese Sign Language suggest (Matsuoka & Gajewski 2013), and it can be amended for more or less intensity (glossed here as *.intens*< and *.intens*+++ respectively). Thus, in (46), *.intens* renders an interpretation of more or less speed.

(46) a. a-IX a-FAST/SMART b-IX $\overline{\text{b-FAST/SMART}}^{intens<}$
Lit. 'A is fast and B is a little faster.' (≈ 'B is a little faster than A.')

b. a-IX a-FAST/SMART b-IX $\overline{\text{b-FAST/SMART}}^{intens+++}$
Lit. 'A is fast and B is a lot faster.' (≈ 'B is way faster than A.')

(47) a. a-IX a-TALL b-IX $\overline{\text{b-TALL*(.}\textit{increase}\text{)/MORE TALL}}^{intens<}$
Lit. 'A is tall and B is a little taller' (≈ 'B is a little taller than A.')

b. a-IX a-TALL b-IX $\overline{\text{b-TALL*(.}\textit{increase}\text{)/MORE TALL}}^{intens+++}$
Lit. 'A is tall and B is a lot taller.' (≈ 'B is way taller than A.')

Thus, further research on .*intens* and its interaction with comparative morphology is needed. Here, we indicate how expressions with .*intens* fare regarding the diagnostics. Additional elements beyond the degree vs. degreeless debate (like the nature of .*intens* itself) are likely to be at stake to account for the data. Our findings are entirely compatible with a degreeless approach. First, on current accounts, .*intens* is adverbial(-like) and does not contain degrees (see Kentner's 2020 section 6.1). Nonetheless, for the sake of comprehensiveness, we added .*intens* to degree questions (48) and differential measure phrases (49). These examples are ungrammatical, which is compatible with both the literature on .*intens* and our approach.[31]

(48) a. *$\overline{\text{aIX BOOK HEAVY WHAT/HOW/HOW-MUCH}}^{intens}$
'How heavy is this book?'

b. *$\overline{\text{KID SMART WHAT/HOW/HOW-MUCH}}^{intens}$
'How smart is this child?'

[31] There was one exception regarding measure expressions: in one case in our data we found that a measure expression was accepted. This case involved .*intens* (.*decrease* below is represented in similar terms to .*increase* in the text):

(i) LIQUID a-IX a-DENSE b-IX $\overline{\text{b-DENSE.}\textit{decrease}}^{intens}$ 15 DEGREE $\overline{\text{DENSE.}\textit{decrease}}^{intens}$ a-IX IMPOSSIBLE
'It's impossible for this liquid to be 15 degrees less dense than that one.'

We suspect that (i) may be accounted for independently of degrees. In addition to the evidence presented here, recent research suggests that .*intens* functs as an intensifier (Schlenker & Lamberton 2021). We tentatively note that other languages employ a variety of word-order strategies in intensification (Beltrama & Bochnak 2015; Beltrama & Trotzke 2019). This also corresponds with a general comment from our consultants, who report that .*intens* implies "an extra comment or maybe something like that" (Consultant X). The current sparsity (1 token) creates an impetus for future research.

(49) a-IX a-HEAVY b-IX $\overline{\text{b-HEAVY}}^{intens}$ 4 LB
'B is 4 pounds heavier than A.'

To sum up, we have offered a comprehensive review of comparison strategies focusing on the question of whether ASL gradable adjectives introduce a degree variable. The discussion in sections 4–5 suggests that this is not the case. While ASL has both implicit and explicit comparison strategies, they can all be readily accounted for by a degreeless approach. Furthermore, we have challenged the potentially natural association between the signing space and the ability to represent iconic scales by arguing that there is no natural, ready-made connection between these two, thus enriching our view of how to address cross-linguistic and cross-modality variation.

6 Initial analyses

This section sketches initial analyses of two constructions, namely, juxtaposition, an implicit comparison strategy (the preferred option of our consultants), and comparative constructions with lexical items like MORE and BEAT, which have received closer attention in previous works (Kentner 2020). The discussion here is programmatic; each construction discussed in this paper deserves further analysis (Treis 2018). We provide degreeless accounts of implicit and explicit comparison strategies below.

Cases of implicit comparison in ASL suggest a biclausal structure with coordination, the exponent of which is usually phonologically null and is represented by a shift in the signing space—this is the so-called "disjunctive shift" often translated as 'and/or' (Davidson 2013). (50) offers a schematic structure—we assume Boolean Phrase BP to represent the disjunctive shift.

(50) $[_{CP}$ BOOK A HEAVY $[_{BP}$ *shift* $[_{CP}$ BOOK B NOT]]]
Lit. 'Book A is heavy; (and) book B is not.' (≈ 'Book A is heavier than book B.')

As a coordinate structure, (50) is subject to constraints on coordination, such as the Coordinate Structure Constraint (Ross 1967). For instance, movement of the NP out of the embedded CP is not possible (51b). This is noteworthy, since topicalization in the language is very robust (51a) (see Kimmelman & Pfau 2021).

(51) a. $\overline{\text{BOOK A}}^{t}$, 1-IX REMEMBER __ shift $\overline{\text{BOOK B}}^{t}$, FORGET __
Lit. 'Book A, I remember; book B, I forgot.'
b. *$\overline{\text{BOOK B}}^{t}$, BOOK A HEAVY *shift* __ NOT
Lit. 'Book B, it is not heavy vs. book A.'

Assuming the degreeless denotation of HEAVY in (52a) (see (6a)) and that context *c* is kept constant, we propose the semantics of (52b) for (50).[32]

(52) a. $[\![\textbf{HEAVY}]\!]^c = \lambda x[x \text{ counts as heavy wrt } c]$
b. $[\![\textbf{(50)}]\!]^c =$ book A counts as heavy wrt *c* & book B does not count as heavy wrt *c*

We now turn to constructions with overt comparative morphemes. Following many works, we assume that the comparative (instantiated by several items in ASL (24)) and the standard form a constituent. For languages like English, this constituent is the specifier of the adjective (Syrett & Gor 2018; Rett 2020). In contrast, in Nez Perce, this constituent is adjoined to the AP (Deal & Hohaus 2019). The immediate consequence of the latter is that a projection of this kind can be ignored by the parser (Deal & Hohaus 2019: 352)—it need not be projected.

We suggest that ASL should be analyzed in similar terms to Nez Perce, with MORE, BETTER, WORSE, and perhaps even *.intens* and *.increase*, receiving a similar analysis to Nez Perce *qetu* (which also alternates with an empty item).[33] We use MORE for illustration. Following Deal & Hohaus's (2019) proposal, we tentatively propose a similar structure for ASL, where these elements appear in a phrasal comparative structure.[34]

(53) $[\ldots DP_{\text{comparee}} \ldots [_{AP}\ AP\ [\text{MORE}\ [_{PP}\ P\ DP_{\text{standard}}]]]]$

MORE is initially assigned the semantics in (54) (see (5)). (24d,d'), repeated here as (55a,a'), are used for illustration. Note that (55a) contains overt THAN, which, according to our consultants, while present in the language, is in fact a dispreferred form. Furthermore, assuming, with previous literature, that prepositions in ASL, THAN included, may be null, and that ellipsis targets phrasal constituents (Koulidobrova 2012), (55a), which we analyze as (55b), may be realized as (55a').[35] (55a,a')'s denotation appears in (55c).

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[32] We leave the issue as to how the relevant comparison class in context *c* is fixed for future research. For simplicity, we assume that *c* is kept constant, acknowledging that a mechanism needs to be involved such that a comparison class is determined for the first CP in (50), and such a comparison class is then further adopted for the second CP, so that negation is evaluated against the (already fixed) comparison class in *c* (see Bochnak 2013 for discussion and Kennedy's (2005) notes about a "highly contextualized use of the positive form").

[33] A detailed discussion of how all these elements differ is left for future research.

[34] While Kentner (2020) notes that the phrasal vs. clausal split has not yet been investigated for ASL thoroughly, some works (Abner et al. 2017; Wilbur et al. 2018) have already argued for the clausal nature of the comparative.

[35] Hattori (2019) argues that some of the structural properties of phrasal vs. clausal comparatives may be explained by the presence vs. absence of the definite article in the language, resulting in the presence vs. absence of the DP. We set this issue aside, noting that previous work has argued against the presence of this projection in ASL (Koulidobrova 2012; Koulidobrova & Lillo-Martin 2016).

(54) $[\![\textbf{MORE}]\!]^c = \lambda y \lambda P_{\langle k,et \rangle} \lambda x \exists c' [P(x)(c') = 1 \ \& \ P(y)(c') = 0]$

(55) a. a-MARY b-PAUL WEIGHT a-IX HEAVY MORE THAN PAUL (24d)
a'. a-MARY b-PAUL WEIGHT a-IX HEAVY MORE
Lit. 'As for Mary and Paul's weight… She_{Mary} is heavier.'
(≈ 'Mary is heavier than Paul.')
b. [… MARY… [$_{\text{AP}}$ [$_{\text{AP}}$ HEAVY] [MORE [$_{\text{pp}}$ THAN PAUL]]]]
c. $[\![\textbf{(55b)}]\!]^c = 1$ iff ∃*c'*[Mary counts as heavy wrt *c'*
& Paul does not count as heavy wrt *c'*]

As argued in Deal & Hohaus (2019), the structure in (53) offers testable predictions. English-type comparatives are ambiguous between internal and external interpretations (56); Nez Perce's are not in that only the internal interpretation is possible (57).

(56) Mary bought a bigger car than John.
External: Mary's new car is bigger than John's car.
Internal: Mary's new car is bigger than John.

(57) a. Meeli hi-'nip-e (qetu) himeeq'is 'atoc [John-nim-kin'ix' 'atoc]$_{\text{standard}}$
Mary.NOM 3SUBJ-buy-TAM more big car John-GEN-from car
'Mary bought a bigger car than John's car.'
b. #Meeli hi-'nip-e (qetu) himeeq'is 'atoc [John-kin'ix']$_{\text{standard}}$
Mary.NOM 3SUBJ-buy-TAM more big car John-from
Rejected as: 'Mary bought a bigger car than John did.'
(Deal & Hohaus 2019, (23), (24), (26))

ASL behaves like Nez Perce (this is illustrated here with .*increase* to show how all these items behave alike in the relevant respect), as in (58). (58c) demonstrates that IX can be used in lieu of POSS (this happens in deferred ostension cases) but is rejected in an external interpretation (58b).

(58) a. a-MARY b-JOHN BUY CAR b-POSS BIG.*increase*
'Mary and John bought cars. John's is bigger.'
b. *a-MARY b-JOHN BUY CAR b-IX BIG.*increase*
Rejected as: 'Mary bought a bigger car than John did.'
c. $\overline{\text{CAR \{2-POSS/2-IX\}}}^{\text{y/n}}$
Lit. 'Is this car yours/you?' (= 'Is this your car?')

Finally, cases with BEAT, which are undoubtedly more complex (Kentner 2020) and require direct experimental data, have been argued to involve a clausal *exceed*-comparative. We preliminarily adopt Baglini's (2012) approach to Wolof (see also Kentner 2020), i.e., a (reduced) clausal analysis. Incorporating some uncontroversial assumptions about ASL (i.e., argument omission and agreement morphology; see Lillo-Martin 1995; Koulidobrova 2017),[36] we assume the presence of agreement morphology on BEAT to indicate that comparee and standard serve as subject and object, and have been elided. The structure we adopt appears below; BEAT moves from V to *v* (see Kentner's 2020 (5.19)).

(59) $[_{vP}\ \text{DP}_{\text{comparee}}\ [_{v'}\ \text{AP}\ [_{v'}\ \text{BEAT}\ [_{\text{VP}}\ \text{DP}_{\text{standard}}\ \text{t}]]]]$

BEAT's initial degreeless lexical entry appears in (60).[37] (61) provides an example.

(60) $[\![\textbf{BEAT}]\!]^c = \lambda y \lambda P_{\langle k,et\rangle} \lambda x \exists c'[P(x)(c') = 1\ \&\ P(y)(c') = 0]$ (54)

(61) a. H-A-W-K-I-N-G a-IX SMART E-I-N-S-T-E-I-N b-IX SMART _a-BEAT-b_ (28b)
'Hawking is smart; Einstein is smart. Hawking is smarter than Einstein/Hawking beats Einstein at being smart.'

b. $[_{vP}$ H-A-W-K-I-N-G $[_{v'}$ SMART $[_{v'}$ BEAT $[_{\text{VP}}$ E-I-N-S-T-E-I-N t]]]]

c. $[\![\textbf{(61b)}]\!]^c = 1$ iff $\exists c'$[Hawking counts as smart wrt *c'* &
Einstein does not count as smart wrt *c'*]

Our proposal then mirrors the data in (and the analysis of) Nez Perce, which is a welcome result, since it suggests that a comparison class can be built in a nuanced scenario (section 5.1), as well as in a completely disparate one (see Deal & Hohaus 2019 for discussion about tall people vs. basketball players), such as comparing Hawking's intellect to Einstein's or a regular individual's. In our analyses for cases with comparative lexical items, the standard is base-generated in a phrase that is a sister of the comparative morpheme, which can be realized as an actual comparative morpheme (e.g., MORE, BEAT) or be null. Since the comparative projection is adjoined, it may be absent, which is a robust option in the language (Lillo-Martin 1989; Koulidobrova 2017). Furthermore, since the comparative projection is adjoined, it may be expected to be mobile with respect to the adjective itself, as shown in our examples (see the Appendix)—this has been reported elsewhere as well (Abner et al. 2017; Wilbur et al. 2018; Kentner 2020).[38]

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[36] Baglini (2012) assumes a degree analysis for Wolof but nothing hinges on this. To our knowledge, this is the first venture into a degreeless analysis of a clausal comparative.

[37] See Kentner (2020) and Kentner et al. (2020) for entries with degrees.

[38] A parallel reasoning holds for SAME: it would have a degreeless semantics that is distinct to that of explicit equatives (Rett 2020).

Overall, we have shown that the data from a variety of signers do not pattern with the previous analyses in the literature (Kentner 2020; see section 4) and that our consultants' judgments pattern differently than in previous reports. We find much less variability, with our consultants reporting ungrammaticality when prompted to provide a judgment for the relevant constructions. The question is what is responsible for the difference. We sketch several possibilities that should be explored independently in future work.

On the one hand, the effects of language contact and the fact that ASL is often used in settings where the dominant language, English, is a degree language cannot be excluded. This view may suggest both ongoing language change and variation, especially given the nature of languaging practices among the deaf, hard of hearing, and other signing populations (Lindeberg 2022; Henner & Robinson 2023). On the other hand, several possibilities arise regarding cross-linguistic influence and code-switching, since most signing adults are bilingual/biliterate in ASL and English. While every precaution has been taken to control for potential direct influence of English during elicitation (including the number of sessions, playback, the number of participants, etc.), some cases of translanguaging are expected to arise nonetheless (Otherguy et al. 2019). Detailed discussion of these issues may shed further light on these matters in ASL.[39] In a nutshell, deaf signers growing up in, or at least spending much of the day surrounded by, the dominant language become non-trivially affected by this language. Thus, in the case of ASL, which is surrounded by English, additional lexical choices (i.e., more than the ordinarily available to a monolingual language user) are available. How to operationalize the use of the languages simultaneously in such a scenario has been the goal of many works (inside and outside the translanguaging literature, including translanguaging by signers; see Sahan & Rose 2021 vis-à-vis Scott & Cohen 2023). We suggest that the reason behind the variability in Kentner's data may lie in the type of language synthesis (Koulidobrova 2012; Lillo-Martin et al. 2016) argued for in other domains of multimodal production.

In addition, it is possible that the variability (e.g., **Table 1**; section 4) is due to different syntactic patterns vs. plausibility of interpretations. For instance, Kentner's glosses do not indicate clause boundaries, which suggests that several parsing strategies may be available. For instance, consider TODAY BEAT YESTERDAY 5 DEGREE HOT, translated as 'Today is 5 degrees hotter than yesterday' (**Table 1**). This utterance could be parsed differently, and, thus, translated as 'it is 5 degrees today; it is hot.' While, technically, less plausible a scenario, it is a possible interpretation. Therefore, one of the reasons for the variability observed in the data (and, especially, as it differs from ours) is the potential difference in the structure (not controlled by the author).

[39] This is too big an issue to take up here but see Garcia & Wei (2014) for general articulation and Swanwick (2017), Allard & Chen Pichler (2018) and Holmström & Schönström (2018) for what this means for deaf signers.

Finally, we suggest that yet another difference is attributable to methodological differences. Kentner (2020) uses an experimental design, utilizing pictures to elicit grammaticality judgments. Our methodology has several additional steps. While experimental methodology has been shown to offer important insights (Sprouse et al. 2013), given the complications that still riddle what we know about sign languages as well as sign languaging, both experimental and more traditional elicitation with playback methodologies ought to be complementary. Here we hope to have shown the need for the latter across signer profiles.

7 Concluding remarks and future directions

This paper addressed gradability in ASL, focusing on the cross-linguistic degree vs. degreeless debate. In contrast to previous discussion for ASL, where a degree approach has been adopted, we argued that ASL is degreeless. This approach provides a unitary and parsimonious account for ASL that captures a variety of constructions with gradable predicates. Our theoretical claim has been grounded in elicitation and playback with 6 consultants across 31 predicates tested in several constructions. Our approach has further challenged Aristodemo & Geraci's (2018) proposal whereby sign languages may directly represent degrees due to the visual nature of sign languages. This claim does not find support in ASL.

We further would like to highlight the data presented here, which have offered a vast number of predicates. The empirical coverage of this study ranges over predicates that differ in the presence vs. absence of absolute endpoints, in iconic terms, in terms of conceptual concreteness and spatial locatability, in terms of their locus for anaphoric potential, in terms of being symmetrically two-handed or not, and in terms of whether they are signed on various parts of the body or disconnected from them. To the best of our knowledge, this is the most comprehensive survey where all these predicate types are studied simultaneously. Furthermore, building on the predicates, we have examined other elements, such as the lexical items involved in comparison, which serves as impetus for the re-examination of previously suggested analyses. For instance, BEAT has been initially looked at both syntactically and semantically, but all authors admit that further analyses are needed (Abner et al. 2017; Wilbur at al. 2018; Kentner et al. 2020). In at least some of the aforementioned works, BEAT has been argued to be a verbal comparative, similar to *exceed* in English and the relevant comparative structures in Hausa, Aymara, Mandarin, etc. (Stassen 1985). Verbal comparatives have not received sufficient attention in the literature; at least some existing work points to a non-degree analysis of such elements independently (Xiao 2007). Further analysis of BEAT, without assuming degrees (contra Kentner et al. 2020) would contribute to this literature directly.

Something similar must be said for MORE, and other overt items examined in the literature on ASL (Kentner 2020; Kentner et al. 2020). Thus, new analyses of the elements already explored by others, as well as of the elements that have not been studied, are needed. The latter includes

items like WORSE, glossed as a comparative form of *bad* in English (although whether it functions as such remains unclear), and SAME, which selects two referents which are potentially independently possible at different heights on the vertical scale (as in Davidson & Gagne 2022). Like verbal comparatives, equatives and similatives have not received adequate attention in the literature (Rett 2020). We have only scratched the surface. Furthermore, the data suggest that a more careful look at implicit comparative structures as well as what we (after others) have broadly glossed as ***.intens*** is needed.

Finally, this paper did not offer an explicit semantics for measurements (or lack thereof), or degree questions (or lack thereof), or demonstrations in ASL, nor did it set out to do so, as it only suggested initial analyses for some strategies in ASL. We do propose, however, that a theory that assumes degrees will need to constrain itself against the inability of the language to do the things that one might need degrees for, at least under some approaches (Bochnak 2015). We thus offered a path for how such a view could be implemented for ASL. To be precise about each structure, however, more dedicated research is needed, which further takes into consideration the diversity of signer profiles and, therefore, eventually results in all instructional materials which incorporate the concept of degrees overtly or covertly.

This paper has thus offered several directions for future research, both in terms of syntax and semantics of ASL and sign languages more generally, as well as across modalities. Several other lines of research become independently possible and are directly predicted by the findings reported here. For instance, this paper has articulated various paths for analyses of the lexical items associated with comparison (MORE, BEAT), as well as their interaction with other elements in the clause. One such element, for instance, is the disjunctive shift (Davidson 2013), which is translated as 'and/or.' In other words, the question is what the interaction (if any) between this element and juxtaposition in terms of overt comparative morphology in ASL is. Another element is SAME(AS). We have made some suggestions as to where one should look to take this examination further. Something similar can be said for ***.intens*** in that previous research has argued that this non-manual intensification marker does not qualify as a morphological comparative, or at least as an element that is to be understood in terms of degrees (Kentner 2020). Overall, we have seen that it is difficult to maintain a degree approach for ASL more generally. Therefore, relying on the intuition of the signers in this study that both the manual and the non-manual components play important but independent roles in the interpretation of gradability in ASL, we hope that future research takes it into consideration.

Furthermore, one might wonder whether the data presented here are independently supported by any other work. To that end, Koulidobrova & Martínez Vera (2021) and Koulidobrova et al. (2022) undertake a longitudinal corpus study of several monolingual ASL and bilingual ASL-English children conversing with their adult interlocutors by examining the SLAASh (Lillo-Martin & Chen Pichler 2008) and BiBiBi (Chen Pichler et al. 2016) corpora. In these works,

Koulidobrova et al. demonstrate robust presence of certain overt lexical items associated with comparatives while, simultaneously, exhibiting clear knowledge of a variety of types of gradable adjectives (see the list in (9)) early on. Unlike what has been observed for English and German learning children, the constructions with gradable adjectives that would require the presence of degrees (such as those in **Table 1** from Kentner 2020 and the ones discussed in this paper) and that would thus inform an ASL learning child about the need for degrees in the language are either exceedingly rare or not attested at all in the child or adult production in the corpora. The aforementioned suggests that the data discussed in this paper, in addition to other efforts such as Kentner (2020), Koulidobrova & Martínez Vera (2021) and Koulidobrova et al. (2022), in combination with the multilingualism reality in which adult signers usually live in (Henner & Robinson 2023), serve as an impetus for larger scale experimental design with wider empirical coverage than previously attempted. Ultimately, these efforts may also contribute to addressing (apparent) gaps in language curriculum.

Supplementary file

An Appendix to the paper providing some background on the use of degrees in ASL in the verbal domain, as well as additional examples for the strategies discussed in the paper can be found here: https://drive.google.com/file/d/1kgC2cD_5Q_7V4DZ8feBOR6cSZ4PEhwKs/view?usp=drive_link.

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Competing interests

The authors have no competing interests to declare.

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