Degrees and depiction- gradability in sign languages

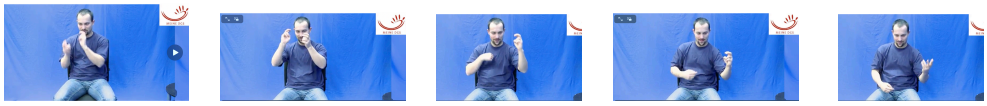
Natasha Thalluri & Kathryn Davidson, Harvard University

Introduction. It has been observed that languages may vary on whether they have lexical items that seem to introduce degree arguments in order to express gradable concepts like *tall* or *heavy*. The Degree Semantics Parameter (DSP) proposes a split between languages that use a degree system and those that use a delineation system (Beck et al., 2009; Bochnak, 2015). It has recently been proposed that the phonological form of gradable predicates in a sign language can iconically represent the boundaries and points on a degree scale, as in LIS (Aristodemo and Geraci, 2018). From this perspective, sign languages seem to offer visible evidence of abstract linguistic objects like scales which have been theoretically motivated in spoken languages but whose existence has been inferred through certain syntactic and semantic cues. However,evidence for a degree-less semantics for ASL (Koulidobrova et al., 2022) suggests that sign languages could vary as much as spoken languages within this domain. We support this claim with similar instances of explicit comparatives from DGS corpus data. We argue for an alternative view of the iconic component in these constructions to be analysed as gestures or demonstrations in the sense of (Davidson, 2015) and as such, iconicity is insufficient to motivate a degree ontology in a sign language because sign languages, being languages, are built around abstraction, and what may appear to be iconic/visible pieces of the grammar are more accurately viewed as gestural depiction. To that end, we provide a proposal based on delineation semantics for these iconic gradable adjectives with a semantics involving depiction rather than degrees to account for the iconicity.

Consider the following comparatives across three sign languages: LIS (1), ASL (2), and DGS (3). All three are instances of explicit comparison involving the gradable predicate TALL signed twice in each sentence, where the form of the sign is modified in order to express the comparison meaning.

(1) MAN TALL-$_{\alpha}$pos$_{\beta}$ WOMAN TALL- $_{\beta}$iconic-more$_{\gamma}$. IX$_{\beta}$ 1 METER 70. IX$_{\gamma}$ 1 METER 80
‘Maria is taller that Gianni. This one (Gianni’s degree) is 1 meter 70 and that one is 1 meter 80.’
(Aristodemo and Geraci, 2018)

(2) 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.’) (Koulidobrova et al., 2022)

(3) 

TALL2A* TALL2A* I2 SMALL 3 GEST-OFF*
‘All the others were taller than me; I‘m just too short’ (Konrad et al., 2020)

Depiction or degrees?. Despite their similarity in both form and meaning, these examples have been given contrasting analyses. Examples like (1) have been cited as motivation for a degree semantics in LIS, with the claim that certain gradable predicates like TALL iconically encode a degree scale in their phonological form. The position of the signer’s hand in space is meant to represent points on the degree scale. The near identical case in ASL has been argued to not encode a degree semantics, base on its inability to be used in structures like ‘x is y taller than z’, in questions, and other instances we expect to find degrees, and thus it’s claimed that gradability in ASL is expressed through a delineation semantics . Hence, a sentence like (2) involves not visible degrees but rather an iconic depiction of tallness. What we are faced with is opposite theoretical claims for essentially the same sentence in two different sign languages, and the deciding factor between the two theories seems to be how the iconicity in such a sentence is interpreted. Now consider a similar sentence from DGS in (3): if one were to make an assumption about the role of iconicity

in expressing a semantic concept like gradability based on LIS or ASL, how would one interpret this data from DGS? Is such a sentence indicative of a degree semantics in the sign language, or is there a depictive component in a degree-less construction?

Two analyses: with and without degrees. Let us accept the conclusions provided in prior literature for LIS (as having degrees) and ASL (as not having degrees); we present two ways of formalising the iconic component of the sign TALL. The first is a degree semantics for LIS. If the position of the hand in the signing space refers to degree variables as suggested by Aristodemo and Geraci (2018), then the hand position δ refers to Gianni's degree of tallness, which we compare to the standard d_s inside the *pos* operator. Adopting the semantics of gradable adjectives from Wellwood (2015), TALL is a predicate of states s, and a measure function $A(\mu)$ introduces a scale along which the degrees are ordered. The value of $A(\mu)$, depends on the the type of entities being measured, and how they are ordered, such that $A(\mu)(s) = \delta$, the "iconic degree" of Gianni's height (4).

(4) $[\![\text{GIANNI TALL}_{\alpha}\text{pos}_{\beta}]\!] = \exists s[\mathit{Holder}(s)(\mathit{Gianni}) \wedge \mathit{Tall}(s) \wedge A(\mu)(s) \succ d_s]$

'Gianni is in a state such that his degree δ of tallness exceeds the standard of comparison d'

Alternatively, we can provide a comparable analysis with a delineation semantics for the ASL counterpart of this sentence where the position of the hand in signing space is analysed as a demonstration δ in the sense proposed by Davidson (2015) for other iconic phenomena. Based on Cariani et al. (forthcoming), TALL is a predicate of states, with the threshold property of being tall, and an ordering of the tall states as a background property; the height δ demonstrates the state (5).

(5) $[\![\text{ALEX a-IX TALL}_{(\mathit{neutral-space})}]\!]^c = [\exists s(s \in \mathit{domain}(\langle D_{\mathit{height}}, \succeq_{\mathit{height}}\rangle))(\mathit{Holder}(s, \mathit{Alex}) \wedge \mathit{Tall}_c(s) \wedge \mathit{Demonstration}(\delta_1, s))]$

'Alex is in a state of being tall (relative to the context c) and δ_1 demonstrates that state.'

In the delineation semantics, the comparison is clearly indirect: we can infer that Alex's height is less than Jo's (thus the translation 'Jo is taller than Alex') by comparing the two demonstrations, e.g. '*Alex is tall like this and Joe is tall like this*'. In contrast, a degree analysis predicts that LIS supports direct comparison for (6), where δ_2 is the "iconic degree" of the woman's height.

(6) $[\![\text{WOMAN TALL}_{\beta}\text{iconic-more}_{\gamma}]\!] = \exists s[\mathit{Holder}(s)(\mathit{woman}) \wedge A(\mu)(s)(= \delta_2) \succ \delta_1]$

'The woman is in a state such that her degree δ_2 of tallness exceeds that of δ_1 (the man's)'

Conclusion. Koulidobrova et al. (2022) provides evidence that the degree analysis cannot work for (at least all of the signers they consulted for) ASL. For example, they note the ungrammaticality of degree questions in ASL, in contrast to a degree-having language like English (e.g. *How tall is he/ How old are you?*). Similarly, differential measure phrases are also reported to be impossible in ASL, in contrast to English (e.g. *Alex is five years older than Mia. / He is 5 inches taller than her.*). These may be possible for some signers of ASL (Kentner, 2020), but importantly, the arguments on both sides are based on the availablity of such structures, independent from the iconicity in signs expressing gradable predicates. Concerning the comparable cases in DGS, we suggest proceeding similarly, asking if we find degree-type structures like degree questions or measure comparatives. Our search of the DGS corpus (Konrad et al., 2020) provided no examples of either, but certainly further investigation with consultants would answer this question more convincingly with the kind of negative evidence that a corpus cannot. Moreover, given the similarity in structure and form to comparatives in ASL and DGS, we suggest that a more convincing analysis of degrees in LIS would be based on these structures in addition to the iconic use of space, which we showed above can be analyzed instead as a depiction/demonstration in a delineation semantics, . Overall, we are struck by the conclusion that sign languages do not all make use of degrees, given their iconic potential, and conclude that, like spoken languages, sign languages make use of a highly symbolic core grammar

while also being able to make reference to iconic depictions that co-occur with linguistic structure.

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