Being tall compared to* compared to *being tall* and *being taller

Introduction. Discussion of 'degree modifiers' like *two feet*, *very*, and *totally* have figured prominently in the degree semantics literature, but *compared to*-phrases, e.g. **(1)** *Blue is tall compared to Red*, have been relatively unattended to. This is an important case, however, given (i) its surface similarity in meaning with **(2)** *Blue is taller than Red* and (ii) its felt context-sensitivity in relation to **(3)** *Blue is tall*. We propose an intuitively plausible, difference-based semantics for *compared to*-sentences and test it alongside its comparative and simple positive variants. We find robust evidence supporting our semantics for (1) in contrast to (2), and new evidence about (3).

Background. _Semantics_. We assume (following e.g. K07), that the interpretation of (3) involves a function **s**, a "context-sensitive function that chooses a standard of comparison in such a way as to ensure that the objects in the positive form is true of 'stand out' in the context" relative to measure function g (i.e., the interpretation of a gradable adjective like *tall*; K99, cp. H00). We leverage the reported, intuitive difference between (1) and (2) towards a hypothesized meaning for *compared to* phrases, and which can be illustrated in the following scenario (i.e., a difference in 'crispness'; F06, K07). Suppose Blue and Red are of nearly identical height but Blue is discernably taller. In this case, (2) is straightforwardly true but not so (1). Now change the context so that Blue is substantially taller than Red; (1) seems true. Thus, we assign a difference-based semantics supporting the following interpretation for *tall compared to Red*: a property true of individuals x just in case the difference between x's and r's height 'stands out' with respect to differences in height from r. Alternatively, (1) may involve determining whether Red or Blue are tall, simpliciter; thus, we should like to test our semantics and to probe the nature of the context-dependence of **s**.
Psycholinguistics. A number of works have explored the evaluation of sentences like (2) and (3). We focus on the latter background. S99 (cp. SG12) tested 9 models of how people judge tallness, with experimental results leaving 2 equally well supported: their Relative Height by Range (RH-R) and Cluster (CLUS) models. Roughly: CLUS says line l is tall if it is in a clear cluster with the tallest line; RH-R says l is tall if it is within the top $k\%$ of the range of heights. RH-R is simpler—having 2 as opposed to 4 free parameters—and differs empirically: among the predictions S99 note might decide between them, (i) CLUS predicts roughly flat 'tallness' for the tall cluster, RH-R is more gradient; (ii) CLUS predicts roughly even 'tallness' for the middle cluster, RH-R is more gradient; (iii) CLUS essentially prohibits any non-zero 'tallness' for the short cluster, RH-R allows it.

Experiments. We designed a set of 6 distributions of 12 thin rectangles, instantiating the cross of factors CLUSTERING (clust, unclust) and SCALING (flat, medium, steep; **Fig.1**). In **E1** (n=20), we asked participants to evaluate a variant of (3)—*The green line is tall*—for each line in each distribution. In **E2** (n=40), participants evaluated variants of (1) and (2) (the factor SENTENCE; between subjects) for each possible combination of lines at a distance of 1, 3, and 5 lines apart. Each of these combinations were tested in $b > r$ and $r > b$ variants (i.e., the factor WINNER; within subjects). In the paper, we report the results of logistic mixed effect regressions, with χ^2 and p values derived from model comparisons, unless otherwise noted. _*E1 results*_. Our results provide initial support for S99's RH-R model over CLUS: for (i), e.g. consider the 4th line from the left in the clust-steep distribution (**Fig.1**), which is visually clustered with the tallest line but nonetheless of middling acceptance (**Fig.2**); for (ii), observe the gradient acceptance in the middle range across the board; finally, regarding (iii), lines in the shortest cluster showed non-zero acceptance. Most importantly, we found no effect of visual clustering. Looking ahead, we extracted a 'tallness value' for each line to leverage as a predictor in E2 analyses. _*E2 results*_. We found robust evidence supporting our proposed semantics: judgments for (1) but not (2) tracked the absolute difference in height between Red and Blue (**Fig. 3**). We analyzed judgments in terms of 'consistency with $b > r$': i.e., responses were coded as 1 if participants said "yes" when Blue won or "no" when Blue lost, and 0 otherwise. There was no overall effect of SENTENCE, but this factor did interact with ABSLINEDIFF, in the predicted direction. Looking back to E1, comparing our base models with models additionally implicating E1's 'tallness values' did not increase predictive power, suggesting that evaluating Red or Blue for tallness simpliciter did not play a role in the evaluation of (1).

Conclusions & directions. E1 supports a 'relative height' over 'clustering' model for the positive form (cf. S99), suggesting that **s** doesn't merely track whether 'x is among the tallest lines' (at least, not as characterized by CLUS). E2 supports a difference-based semantics for *compared to* phrases, as responses to (1) patterned differently from those of (2), and were tuned to (call it) the salience of difference in height between the target lines, over and above any differences in how 'tallness' is resolved for either of them. In the paper, we explore alternative diagnoses of the difference between (1) and (2) which ties 'crispness' differences to appeal to degrees in the latter, but their absence in the former. On such an alternative, *tall* expresses a property of partially-ordered, possible *states* (cf. F06; cp. B06), which may differ in granularity from degrees.

Figure 1: Distributions of lines used in **E1** and **E2**.

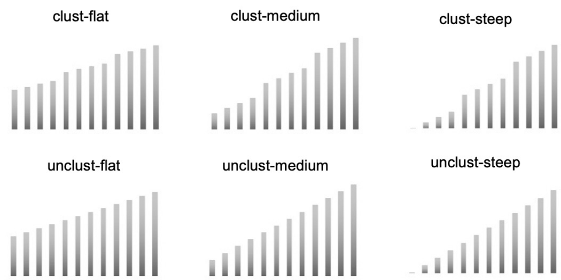


Figure 2: Proportion "yes" to *[That line] is tall* for each line in each distribution (**E1**).

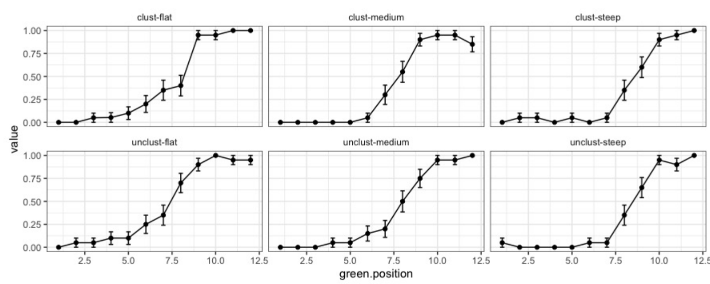
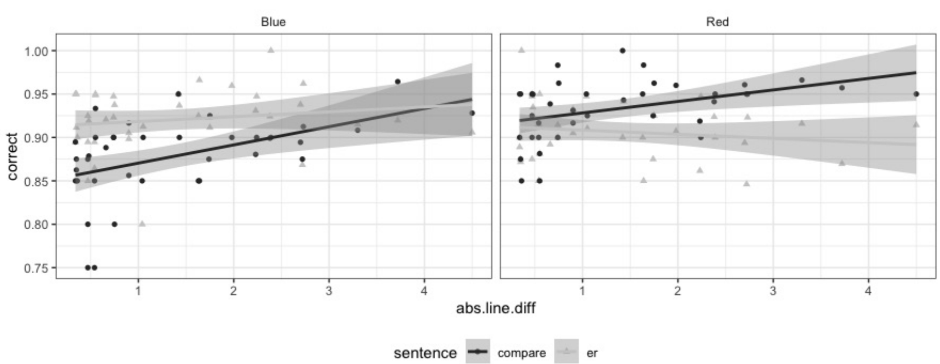


Figure 3: Proportion responses consistent with '$b > r$' interpretation by sentence and winner (**E2**).



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