

Notes on the Comparison Class

Stephanie Solt

Zentrum für Allgemeine Sprachwissenschaft

It is common (e.g. Klein 1980) to analyze sentences involving vague expressions, such as (1), as being interpreted with reference to a comparison class that serves to provide a standard of comparison. For example, (1a) might be interpreted as saying that Fred's height exceeds the standard for some set of individuals of which Fred is a member (adult American men, 8-year-old boys, basketball players, etc). This view is made more plausible by the fact that the comparison class may apparently be made overt with a *for* phrase (2):

- (1) a. Fred is tall
 b. Sue's apartment is expensive
 c. George doesn't have many friends

- (2) a. Fred is tall for an eight year old
 b. Sue's apartment is expensive for an apartment on this street
 c. For a politician, George doesn't have many friends

This paper addresses the question of how the standard of comparison is set relative to the comparison class: what information does the comparison class provide, and how does this enter into the semantic representation.

Kennedy (2007) makes the important point that the standard cannot be an average over the comparison class, in light of the felicity of examples such as (3):

- (3) Nadia is taller than the average gymnast, but she's still not tall for a gymnast

Taking the standard of comparison to be an average (or any other single point) provided by the comparison class also raises questions as to the proper treatment of positive/negative antonym pairs such as *tall* and *short*. It seems that pairs such as (4a,b) are interpreted with reference to the same comparison class (either overt or covert). But if we take the standard of comparison in both cases to be a single point d_{Std} provided by that class (5), we fail to account for the common view that *tall* and *short* are contraries rather than contradictions, in that there is a range of heights (not a single point) for which both (4a) and (4b) would be judged false. On the other hand, if we take *tall* and *short* to invoke different standards (6), we run into the question of how those two values are related to each other, and to the comparison class. Specifically, why is $d_{Std-tall}$ necessarily taken to be greater than $d_{Std-short}$? Barring stipulation, there is nothing obvious that rules out the opposite situation ($d_{Std-tall} < d_{Std-short}$), which would allow both (4a) and (4b) to be true simultaneously, relative to the same context and comparison class.

- (4) a. Fred is tall (for an 8-year old)
- b. Fred is short (for an 8-year-old)
- (5) a. HEIGHT(fred) > d_{Std}
- b. HEIGHT(fred) < d_{Std}
- (6) a. HEIGHT(fred) > $d_{Std-tall}$
- b. HEIGHT(fred) < $d_{Std-short}$

These objections are overcome by taking the standard of comparison to be not a point but a range (R_{Std}), as proposed by Seuren (1973) and more recently von Stechow (2006):

- (7) $\llbracket(4a)\rrbracket = 1$ iff HEIGHT(fred) > R_{Std}
- $\llbracket(4b)\rrbracket = 1$ iff HEIGHT(fred) < R_{Std}

Support for the range-based approach, and a clue to its relationship to the comparison class, is provided by examples such as these, based on Kennedy (2007):

- (8) a. Sue's apartment is expensive (for an apartment on this street)
- b. Paul's apartment is inexpensive (for an apartment on this street)

Suppose that the average rent (for an apartment on this street) is \$700, and that Sue's rent is \$800, and Paul's is \$600. If the vast majority of apartments on this street rent for between \$650 and \$750, we might judge both (8a) and (8b) to be true, given that both Sue's and Paul's rents fall outside of this typical range (Sue's on the high side, Paul's on the low side). But now suppose that there is greater variation in the rents on the street (say, rents anywhere between \$500 and \$1000 are common). Then it seems that (8a,b) would no longer be judged true, despite the fact that neither the average rent nor the values corresponding to Sue and Paul have changed. Here, information about the comparison class is clearly relevant to determining the threshold values for *expensive* and *inexpensive*. Specifically, it seems that we base these judgments on a range that encompass the values associated with most members of the comparison class – a range that may be wider or narrower depending on how much dispersion there is in that class.

This can be made more precise by adopting a statistical metaphor: the standard range R_{Std} is the mean over the comparison class plus or minus n standard deviations (for some small n), where the standard deviation is a measure of dispersion around the mean. For (8):

$$(9) \quad R_{Std} = \text{mean}_{\lambda x.x \text{ is an apartment on this street}} \text{COST}(x) \pm n \cdot \text{StdDev}_{\lambda x.x \text{ is an apartment on this street}} \text{COST}(x)$$

Thus the comparison class serves to provide statistical information on the basis of which a standard can be calculated.

Here, it bears mentioning that several classic theories of vagueness likewise posit a boundary range in the interpretation of vague predicates, corresponding to so-called borderline cases. In a three-valued logic (Tye 1992), this is the range of values where for a vague predicate P , $P(x)$ is neither true nor false; for an epistemic theory (Williamson 1992), it is those values for which we cannot know if $P(x)$ is true or false. But it is not my intention to equate the standard range R_{Std} with this apparent truth value gap. The rationale is that for a value that falls squarely within R_{Std} , the intuition is that the relevant sentence is just false, rather than neither (knowably) true nor false, as is the case with borderline individuals. For example, if Sue's rent is close to the mean for apartments on this street (given the spread of the curve), (8a) is, I would argue, false. In the present proposal, the correlate to the truth value gap is actually the value n . The intuition that a vague predicate such as *expensive* has fuzzy rather than sharp boundaries stems from the under-determination of n , i.e. how far from the mean (in terms of number of cases) an apartment's cost must be for that apartment to count as *expensive*.

Let us turn now to the question of how the information about the comparison class enters into the semantic representation, starting with the case with an overt *for* phrase. Kennedy proposes that the *for* phrase introduces a domain restriction on the gradable expression: *tall for an 8-year old* (after composition with a null positive morpheme POS) is a predicate true of an 8-year-old if his or her height exceeds the value that would be considered significant for an 8-year old:

$$(10) \quad [\text{POS tall for an 8-year-old}] = \\ = \lambda x. [\lambda y. \text{8-years-old}(y). \text{HEIGHT}(y)](x) > s(\lambda y. \text{8-years-old}(y). \text{HEIGHT}(y))$$

Note that this is not inconsistent with the range-based approach developed here, in that in statistical terms, what qualifies as ‘significantly’ greater than the mean is calculated in terms of standard deviations.

The nice consequence of the analysis represented in (10) is that it captures the presuppositional nature of the *for*-phrase: for example, (2b) is infelicitous unless Fred is, in fact, 8 years old. But appealing as this approach is, it is less clear how it would deal with examples such as the following:

- (11) a. Fred reads difficult books for an 8-year-old
- b. The store is crowded for a Tuesday

In (11a), we again have a presupposition that Fred is an 8-year-old, but one that cannot be readily analyzed as a domain restriction on the gradable adjective *difficult*, in that Fred is not an argument of that adjective. (11b) seems to introduce a comparison class of times, and correspondingly presupposes that the time of evaluation is a Tuesday (as evidence, note that this sentence would be infelicitous if uttered on a Friday). We might seek to capture this via a domain restriction on times, but it is not clear how we could identify a value that would be significant relative to the resulting set $(\lambda x \lambda t: \text{Tuesday}(t). x \text{ is crowded at } t)$, independently of the entity of which *crowded* is predicated.

Observe also that the *for* phrase can – and in some cases must – be separated from the gradable expression, odd if they compose semantically.

- (12) a. (For an 8-year old,) Fred is tall (for an 8-year old)
- b. (For an 8-year-old,) Fred reads difficult (*for an 8-year old) books
(for an 8-year old)
- c. (For an amateur,) Martha is a good (*for an amateur) golfer (for an amateur)
- d. (For a politician,) George has few (*for a politician) friends (for a politician)

But note that there is a parallel between the position of the *for* phrase and the position of a *than* phrase in a comparative (13), suggesting an interpretive parallel as well.

- (13) a. Fred reads more (*than most 8-year-olds) difficult books (than most 8-year-olds)
- b. George has fewer (*than most politicians) friends (than most politicians)

Than phrases have been analyzed as arguments of the comparative morpheme *-er*, which has raised covertly from its surface position to take wider scope (Heim 2000; Bhatt & Pancheva 2004; a.o.). I propose that sentences of the form under consideration involve a null degree morpheme POS, which is likewise interpreted in a position of wider scope than that of the gradable expression. I give POS the entry in (14):

$$(14) \quad \llbracket \text{POS} \rrbracket = \lambda P_{<d,\text{et}-} \lambda y_e \cdot id[\lambda x. P(x,d)(y)] > R_{\text{std}}, \text{ where} \\ R_{\text{std}} = \text{mean}_x(d:P(x,d)) \pm = n \cdot \text{StdDev}_x(d:P(x,d))$$

Building on Kennedy’s approach, I further take the *for* phrase to introduce a domain restriction on the complex lambda expression that serves as the first argument of POS. To take the otherwise difficult-to-analyze (11a) as an example, we derive the logical form in (15a), and the semantic interpretation in (15b):

- (15) Fred reads difficult books for an 8-year old
- [Fred_i [POS_j [for an 8-year old [x_i reads d_j difficult books]]]]]
 - $$\begin{aligned} & \text{POS}((\text{for an 8-year-old})(\lambda d \lambda x. x \text{ reads } d \text{-difficult books}))(Fred) \\ & = \text{POS}(\lambda d \lambda x. \text{8-year-old}(x). x \text{ reads } d \text{-difficult books})(Fred) \\ & = \text{id}[(\lambda x. \text{8-year-old}(x). x \text{ reads } d \text{-difficult books})(Fred)] > \\ & > \text{mean}_{x: \text{8-year-old}(x)}(d: x \text{ reads } d \text{-difficult books}) + \\ & n \cdot \text{StdDev}_{x: \text{8-year-old}(x)}(d: x \text{ reads } d \text{-difficult books}) \end{aligned}$$

Here, the standard of comparison is calculated based on the mean and standard deviation over the set of 8-year-olds, thus capturing the standard-setting role of the *for* phrase. The domain restriction on the individual variable captures the presupposition that Fred is 8 years old.

Importantly, this approach can also be extended to cases such as (11b), if we allow POS to operate over logical types other than individuals. For example, replacing the individual variable with a variable over times yields the following:

- (16) The store is crowded for a Tuesday
- $$\begin{aligned} & \text{POS}(\lambda d \lambda t. \text{Tuesday}(t). \text{the store is } d \text{-crowded at } t)(t^*) \\ & = \text{id}[(\lambda t. \text{Tuesday}(t). \text{the store is } d \text{-crowded at } t)(t^*)] > \\ & > \text{mean}_{t: \text{Tuesday}(t)}(d: \text{the store is } d \text{-crowded at } t) + \\ & n \cdot \text{StdDev}_{t: \text{Tuesday}(t)}(d: \text{the store is } d \text{-crowded at } t) \end{aligned}$$

Here, the standard is computed with reference to the degrees to which the store in question is crowded on Tuesdays, eliminating the issue discussed above.

Finally, in the case where there is no overt phrase *for* phrase, I propose that the comparison class (that is, the set over which the mean and standard deviation are calculated) is contextually determined. I further discuss cases in which the standard of comparison is not obviously determined with reference to a comparison class.

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