Many* Readings of *Most

The literature recognizes at least three distinct readings of *many*, cardinal, proportional, and reverse proportional (RP) (Westerståhl 1984, Partee 1988, Büring 1996, Herburger 1997, Cohen 2001).

(1) Many Scandinavians are Nobel prize winners

a. |Scandinavian Nobel prize winners| is large_C *(Cardinal)*

b. |Scandinavian Nobel prize winners|/|Scandinavians| is large_C *(Proportional)*

c. |Scandinavian Nobel prize winners|/|Nobel prize winners| is large_C *(RP)*

In this paper, we observe that the same multiple ambiguity of *many* exists with *most* as well. Furthermore, we identify a new reading of *most*, which we call the *"fragile" superlative reading*. We claim that this finding lends support to Hackl's (2009) decompositional analysis of *most* as being composed of *many* and the superlative morpheme *-est*.

>1/2 and superlative readings of *most*: Two readings of *most* are discussed in the literature: a reading similar to *more than half*, henceforth >1/2 reading, (2), and a superlative reading, (3) (Szabolcsi 1986, Heim 1999, Hackl 2009, Kotek et al. 2011).

(2) John talked to most of the students *(>1/2)*

$\approx$ |students John talked to| $>$ |students John did not talk to|

(3) John talked to the most students *(Superlative)*

$\approx$ for all salient alternatives *x* to John : |students John talked to| $>$ |students *x* talked to|

RP superlative reading of *most*: Although previously unnoticed in the literature, *most* has a third reading, which we call a RP superlative reading. Consider (4), the RP reading of which compares proportions of semanticists from different countries.

(4) Of China, the Netherlands, and the US, the Netherlands has the most semanticists

Suppose that there are many more semanticists in China and the US combined than in the Netherlands. Hence the >1/2 reading is false. Also assume that more come from the US than from the Netherlands, which makes the superlative reading false. Suppose further that the proportion of Dutch semanticists out of the Dutch population is larger than the corresponding proportions among the US and Chinese populations. In this situation, (4) is judged true. This reading, we claim, is similar to the RP reading of *many*.

"Fragile" superlative of *most*: In addition to the above mentioned three readings of *most* (>1/2, superlative, RP superlative), we observe that there is yet another reading of *most*. This reading most prominently manifests itself in "strong" environments, for example in the subject position of individual-level predicates (Kratzer 1995, Diesing 1992). As Kotek et al.'s (2011) experiments show, a superlative reading of *most* in subject position is generally latent and its acceptability varies across speakers. We observe that speakers who can access a superlative reading of (5), where the main predicate is stage-level, accept it in a situation like, 9 in CA, 4 in MA, 4 in IL, 4 in TX, ..., regardless of the number of comparisons.

(5) Most of the students are in California

For the parallel example (6), however, speakers report a "breaking point" in the judgment, i.e. in this case after 5-6 comparisons have been made, the sentence becomes false. Consider the situation, 9 from CA, 4 from MA, 4 from IL, 4 from TX, ...

(6) Most of the students are from California

This "fragile" superlative reading of (6) is characterized by sensitivity to the number of comparisons, and to the distance between the numbers compared, unlike the previously recognized "regular" superlative reading of (5), which is truth conditionally insensitive to both of these factors.

Analysis: Hackl (2009) proposes a decompositional analysis of most as *many+-est*, which we adopt there. He assumes that *many* and *-est* have the semantics in (7), and are base-generated as sisters. Notice in particular that (7a) is a cardinal semantics for *many*.

(7) a. $[\![\text{many}]\!] = \lambda d.\lambda x.|x| \geq d$

b. $[\![\text{-est}]\!](C)(P)(x) \Leftrightarrow \exists d[P(d)(x) \wedge \forall y \in C[y \neq x \Rightarrow \neg P(d)(y)]]$

Hackl assumes that in order to solve a type-mistmach, *-est* undergoes covert movement. He attributes the $>$1/2 and superlative readings of *most* to the scope of *-est* and different comparison classes C that *-est* takes. Roughly put, if *-est* moves DP-internally, a $>$1/2 reading is derived with C set to pluralities of students closed under i-sum formation. If *-est* moves into the matrix clause, on the other hand, a superlative reading is derived, with the comparison class C comprising of all relevant individuals.

(8) a. $[\![\text{John talked to most of the students}]\!] \Leftrightarrow \exists d \exists X[\text{students}(X) \wedge \text{John talked to } X \wedge |X| \geq d \wedge \forall Y \in C[Y \neq X \Rightarrow \neg|Y| \geq d]]$

b. $C = {}^*[\![\text{student}]\!]$

(9) a. $[\![\text{John talked to the most students}]\!] \Leftrightarrow \exists d \exists X[\text{students}(X) \wedge \text{John talked to } X \wedge |X| \geq d \wedge \forall y \in C[y \neq \text{John} \Rightarrow \neg \exists Y[\text{students}(Y) \wedge y \text{ talked to } Y \wedge |Y| \geq d]]]$

b. $C \subseteq D_e$

Adopting Hackl's decompositional analysis, we suggest that the different readings of *most* are derived from different readings of *many*. Specifically, we propose that cardinal *many* is used to derive the familiar $>$1/2 and superlative readings of *most* as in (8) and (9), while the RP *many* (1c), yields the RP superlative reading of *most*, and the proportional *many* yields the fragile superlative reading. While the RP superlative reading of *most* follows rather straightforwardly in the present analysis, assuming that *many* has the RP semantics, the fragile reading merits some discussion.

Deriving the fragility: Why does the proportional *many*+*-est* give rise to the fragile reading? We claim that this is because the proportional *many* is "cardinally evaluative", as illustrated in (10).

(10) $[\![\text{Many}_p\ As \text{ are } Bs]\!] \Leftrightarrow [|A \cap B|/|A| > r_C] \wedge [|A \cap B| > s_C^A]$

Here r_C is the contextually determined standard for large proportions, and s_C^A is the contextually determined standard for large cardinalities relative to A. For our purposes, it is crucial that s_C^A is relativized to A. Notice that we are departing from the standard truth conditions for the proportional *many*, (1b), where the second conjunct of (10), i.e. the cardinal evaluativity, is absent. However, its effect is hard to observe with the proportional *many*, as situations where the proportional truth conditions, i.e. the first conjunct of (10), are true are often ones where the cardinal evaluativity is also satisfied (cf. Partee 1988). However, we claim that the superlative construction brings its effects to the surface in the form of the fragility effect. To corroborate this proposal, we observe a similar context sensitivity between the cardinal *many*, whose truth conditions are equivalent to the second conjunct of (10), and the fragile superlative reading of *most*.

Consider the following sentence, whose truth conditions we assume are $[|\text{blue dots}| > s_C^{\text{dots}}]$.

(11) In this picture of dots, there are many blue ones

Suppose that there are 9 blue dots, and n non-blue dots. As n increases, there is a breaking point at which the sentence becomes false. Crucially, we observe that this pattern of judgments mirrors that of the following sentence with *most* under the fragile superlative construal, in the sense that they become false in the same situations.

(12) Most of the dots are blue

Suppose now that there are 9 blue dots, 4 yellow dots, 4 red dots, etc. As explained above, the fragile superlative reading becomes false after 5 or 6 comparisons in such a situation. Our observation is that the point at which (12) becomes false is the same point at which (11) becomes false. Interestingly, the judgments for (12) are also affected by the composition of the non-blue dots, and so are the judgments for (11). Suppose that there are 9 blue dots, 2 yellow dots, 2 red dots, etc. Compared to the earlier situation, both (11) and (12) stay true with more comparisons than 5 or 6.

In order to explain this parallelism, we propose that *-est* only operates on the proportion argument of $many_p$ and retains its cardinal evaluativity. Thus, the truth conditions for the fragile superlative reading of (12) look as follows.

(13) For all non-blue colors c, $[|\text{blue dots}|/|\text{dots}| > |c \text{ dots}|/|\text{dots}|]$ and $[|\text{blue dots}| > s_C^{\text{dots}}]$

Notice that (13) entails (11), which captures the parallel judgments.