A Superlative Reading for *Most*

Introduction. Recent studies ([1], [2]) have proposed competing analyses of the determiner *most*, using results of verification studies as key evidence (based on the ITT, 1). [1] argues that *most* is a superlative construction and that verifying *most* statements effectively involves the comparison of $|A \cap B|$ and $|A - B|$. For expository purposes, we take (2) to be a sufficient approximation of this view. [2] proposes an alternative, (3), based on the observation that under extremely short presentations of a visual scene the complexity of $A-B$ does not affect the accuracy of *most* statements. (3) accounts for this insensitivity because $A-B$ is not directly used in the verification of *most*(A)(B); rather, its cardinality is computed from $|A|$ and $|A \cap B|$.

(1) The Interface Transparency Thesis (ITT) [2]
The verification procedures employed in understanding a declarative sentence are biased towards algorithms that directly compute the relations and operations expressed by the semantic representation of that sentence.

(2) $[\![\text{most}]\!](A)(B) = 1$ iff $|A \cap B| > |A - B|$ [1]

(3) $[\![\text{most}]\!](A)(B) = 1$ iff $|A \cap B| > |A| - |A \cap B|$ [2]

This study provides new experimental evidence in favor of an analysis of *most* as a superlative. The evidence comes in the form of a hitherto unnoticed latent superlative reading of sentences with *most* in subject position, like *most of the dots are blue.*

Our study. We conducted an experiment that compared the verification of quantified statements containing *most* and *more than half*. We take *more than half* as a baseline against which the two competing representations for *most* can be compared. Specifically, we assume that the semantics of *more than half* explicitly references A and $A \cap B$, but not $A-B$, (4). If the correct representation of *most* is as in (3) then the same entities are involved in the verification of *most* and *more than half*, and we would expect them to be similarly affected by a manipulation of the complexity of $A-B$. If the correct representation of *most* is as in (2), we expect the manipulation to affect *most* differently than *more than half.*

(4) $[\![\text{more than half}]\!](A)(B) = 1$ iff $|A \cap B| > \frac{1}{2}|A|$ [1]

Methods and Design. We used the Self-Paced Counting method as in [1]: 51 participants verified statements such as (5)-(6) relative to arrays containing 13-18 dots displayed on a computer screen. The dots were uncovered in groups of 2 or 3 as participants pressed the spacebar. The dependent measure is the accuracy rates of the answers. To test whether the complexity of $A-B$ affects verification we followed the approach in [2] and varied the number of colors that dots in $A-B$ may have. Arrays thus contained either two colors (2-Color condition) or three colors (3-Color condition).

(5) Are most of the dots blue?

(6) Are more than half of the dots blue?

Results. We observe two surprising results: **1.** The accuracy rates for the *true* items of both of the proportional determiners are surprisingly low. **2.** Participants answered *True* more often in the 3-Color condition than in the 2-Color condition for *most*, but the accuracy rates for *more than half* remain the same across both Color conditions. That is, we observe a *Truth×#Colors* interaction for *most* ($p<0.05$, contrast-coded Mixed Logit Model with random subject and item effects) but not for *more than half*. Figure 1 shows the accuracy rates in the experiment for *most*, *more than half* and *more than n* broken down by the Color condition and by True vs. False.

Discussion. We suggest that the increase in the number of *True* answers to *most* statements in 3-Color arrays can be explained by a superlative analysis of *most* as in [1] and is unexpected under [2]. When more than two distinct subsets of dots are salient in the context, *most* is ambiguous between a dominant proportional reading, which is equivalent to *more than half*, and a latent superlative reading, according to which a sentence like (5) is true iff $|A \cap B|$ is greater than the cardinality of all contextually salient subsets of A−B. As a result, in a 3-color array with the ratio 7:4+4, (5) is considered false under a proportional reading but true under a superlative reading. A corresponding 7:8 array in a 2-color condition is always judged false because the sentence is false under both readings.

Our experiment indicates that there is tension between the bias to choose the interpretation that makes the sentence true (the Principle of Charity, which states that when faced with an ambiguous sentence that is true on one reading and false on the other, language users prefer the reading of the sentence that makes it true) and the difficulty in revising the initial parse of a sentence (Dominance), [3]. It appears that in the competition between Dominance and Charity, one principle wins on some occasions and the other wins on other occasions, explaining the increase in true answers in the 3-Color condition.

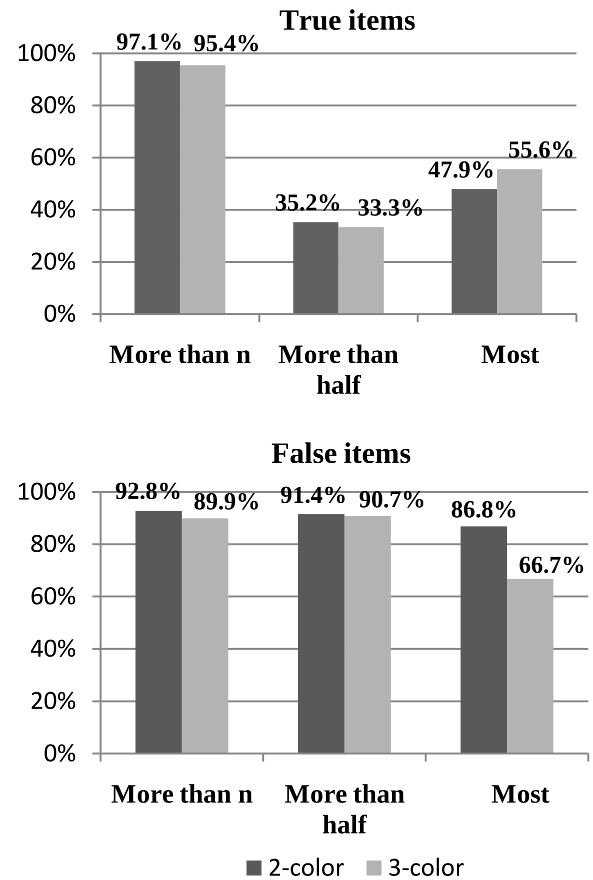

Figure 1: accuracy rates in the experiment

We suggest (7), an extension of the analysis in [1], as the meaning of *most of the As are Bs.* It will return true iff there is a plurality X that satisfies both A and B and that has more atomic parts than any non-overlapping alternative plurality Y in a comparison class C. Our findings can be explained under the assumption that the setting for C is by default as in (7a) and that a setting as in (7b) can be achieved in rich enough contexts that suggest a natural partition of the domain of quantification. Under extremely short presentations of a scene the partitioning of the domain is not supported and hence [2] do not observe sensitivity to the number of colors in their arrays.

(7) $\exists X\, [{*A}(X) \wedge {*B}(X) \wedge \forall Y\, [Y \in C \wedge Y \neq X \rightarrow |X| > |Y|\,]]$ *X,Y pluralities*

Presupposition on C: C contains at least two non-overlapping elements.

a. $C = {*A}$ (A closed under i_sum-formation) *proportional reading*

b. $C = \{X: X \in {*A} \wedge (X \in {*D_1} \vee X \in {*D_2} \vee \dots)\}$ *superlative reading*

(where $D_1, D_2, \dots$ = subsets in a salient partitioning of A)

References. [1] Hackl, Martin. 2009. On the grammar and processing of proportional quantifiers: *most* versus *more than half*. Natural Language Semantics, 17: 63–98.

[2] Lidz, Jeff, Pietroski, Paul, Hunter, Tim and Halberda, Justin (in press). Interface Transparency and psychosemantics of *most*. Natural Language Semantics.

[3] Musolino, Julien and Jeffery Lidz. 2003. The scope of isomorphism: turning adults into children. Language Acquisition 11(4): 272-291.