

## GRAMMATICAL CONTEXT AFFECTS ONLINE SCALAR IMPLICATURE COMPUTATION

*Some*, and similar scalar terms, are typically analyzed as having lower-bounded semantic meanings (some-and-possibly-all) which are often supplemented with pragmatic inferences known as scalar implicatures (SI's) resulting in upper-bounded interpretations (some-but-not-all). Most theoretical treatments predict that probability of SI generation should vary with sentential context (Horn, 1989; Sperber & Wilson, 1986). This has proven difficult to test in online comprehension; context manipulations typically introduce potential confounds. For example, Breheny et al. (2006) varied the lexical content of the passage; thus the results may be related to semantic integration or lexical access, rather than implicature generation.

The present study employs a tightly constrained contextual manipulation, suggested by the grammatical theory of implicature. Chierchia (2006) notes that SI is influenced by semantic monotonicity. While SI's are typically calculated in upward-entailing contexts (1), they are generally absent in downward-entailing contexts (2).

- (1) John ate/some of the cookies/this morning/before breakfast,/and the rest/are on the counter.
- (2) If John ate/some of the cookies/this morning/before breakfast,/then the rest/are on the counter.

Because upward- and downward-entailing contexts can be lexically matched, they provide a highly-constrained contextual manipulation. In Experiment 1, participants in a self-paced reading study read sentences like those above. If *some* is strengthened to *some but not all* in (1) but not (2), assigning reference to *the rest* should be harder in (2) than (1), leading to slower reading time in the final segments of (2). Precisely this pattern was observed, though limited to the final segment, suggesting difficulty spilled over into this region (Figure 1;  $p=.001$ ).

Control sentences were created by changing *some* to *only some* in both (1) and (2), which semantically forces the reading *some-but-not-all*. The slow-down in the final segment of (2) disappeared in this control condition ( $p>.1$ ), demonstrating that this effect is tied to interpretation of *some* and not to other effects of the conditional. The interaction between entailment context and *some* vs. *only some* was significant ( $p=.02$ ).

In Experiment 2, we removed the two text segments between the quantifier segment and *the rest*, which eliminated the significant effects of entailment context (Figure 2). The 3-way interaction of experiment, entailment and *some/only-some* was significant ( $F(1,70)=7.7, p<.01$ ). This suggests that SI generation is relatively slow (Bott & Noveck, 2004). In (1) there was insufficient time to compute the implicature prior to reading *the rest*, eliminating the difference between conditions. The results of both experiments were replicated in a separate study. This 3-way interaction is problematic for alternate explanations involving naturalness, frequency or the pragmatics of conditionals.

Unlike Breheny and colleagues, we did not find slower RT's for the scalar term in upper-bounding contexts, suggesting immediate SI generation ( $ps>.1$ ). This suggests that either 1) global contextual manipulations lead to more rapid processing, or 2) the early contextual effect in the Breheny study reflects implicature-irrelevant lexical and semantic properties of the stimuli.

These results demonstrate that semantic monotonicity plays a critical role in SI generation, as predicted by the grammatical theory.

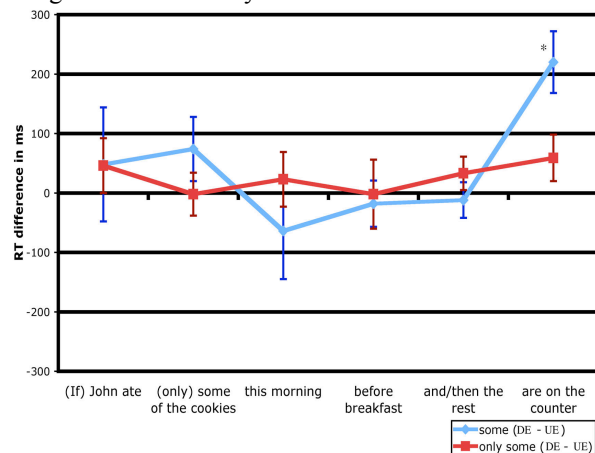


Figure 1.

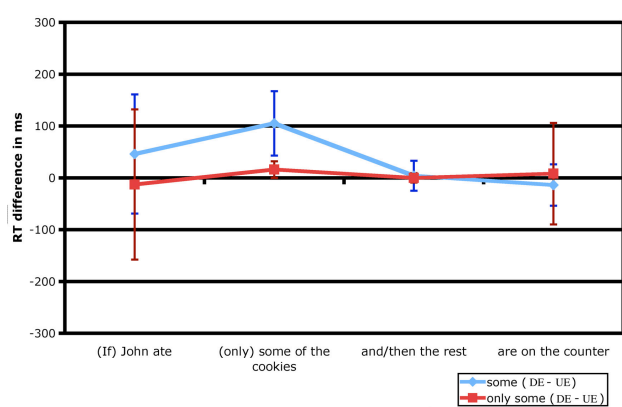


Figure 2.