THE EFFECT OF POLARITY ON SCALAR IMPLICATURE PROCESSING

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A sentence containing a scalar word (e.g., *some*) often carries a scalar implicature (SI), which is the negation of its stronger alternative from the same scale (e.g., *not all*). Conflicting evidence has been found regarding the question whether SI processing is costly or delayed [1-2]. While previous studies have primarily focused on the lexical scale of <*some*, *all*>, recent findings suggest that generalisations across all lexical scales may not hold [3]. [4] tested the cognitive processing of seven scales by measuring response times in a truth-value judgement task and by measuring responses in a memory load task. It was found that the SIs of positively scalar words (e.g., *some*, *or*) were associated with a processing cost, but those of negatively scalar words (e.g., *low*, *scarce*) were not. One possible explanation for this processing difference is that positively scalar words introduce negative SIs (e.g., *some* implies *not all*), while negatively scalar words introduce positive SIs (e.g., *scarce* implies *present*). Consequently, the observed processing cost of positively scalar words may be attributed to the difficulty of processing negative information. Building upon these findings, our study aims to examine the effect of polarity on the real-time processing of different scalar words.

Three experiments were conducted: two self-paced decision tasks (Exp1-2) and a visual-world eye-tracking study (Exp3). In Exp1, participants viewed a scene with four objects while reading sentences that contained either positively scalar words (*usually* or *always*) or negatively scalar words (*rarely* or *never*). Using the same paradigm, Exp2 tested two additional scalar pairs, namely <*some*, *all*> and <*not all*, *none*>. In both experiments, sentences were presented in a self-paced manner (Fig. 1). Participants advanced through the sentences by clicking on the object they believed the sentence described. In Exp3, participants were presented with the same displays as in Exp1-2. They listened to sentences containing scalar words (using the same words as in Exp 1), while their eye movements were recorded. The participants' task was to click on the referent of each sentence.

All three studies employed a 2x2 design, with polarity (positively or negatively scalar) and strength (weak or strong word) as repeated-measure factors. The critical window for analysis started from the appearance/onset of the scalar word and ended just before the appearance/onset of the colour word (also the disambiguation word). During this window, the literal interpretations of stronger words (e.g., *always, never*) were sufficient for determining the correct reference. However, weaker words (e.g., *usually*, *rarely*) were referentially ambiguous based on their literal interpretations alone, and the correct reference could only be identified by computing their SIs. In Exp1-2, we found an interaction between strength and polarity (p = .01): the proportion of target clicks was lower for sentences with *usually* or *some* compared to those with *always* or *all*; no significant difference was observed between sentences with *rarely* or *not all* and those with *never* or *none*. In Exp3, we found that target identification was not delayed when comparing sentences with *usually* to those with *always*, but was faster for *rarely* compared to *never*. These results suggest that the presence or absence of a processing cost for SIs is modulated by the polarity of scalar words. The process of deriving Sis incurs no cognitive cost, but a cost may emerge during verification if the SI expresses a negative proposition.

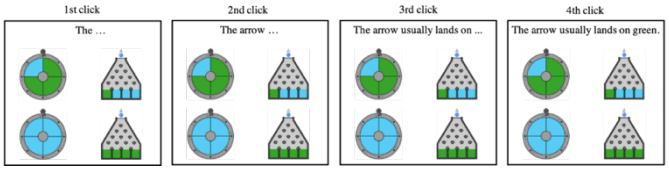

Fig.1

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