Failing Alternatives Lower the Acceptability of Definite Descriptions

Zander Lynch, Helena Aparicio; Cornell University

The acceptability of definite descriptions (e.g., *the star*) has been shown to be lowered when comprehenders consider alternatives that fail to refer [1,2]. Here, we investigate whether suppressing non-viable alternative descriptions during *online* comprehension lowers the *offline* acceptability of an otherwise defined description. In two English experiments, we test DPs with two-modifiers (e.g., *the small*/*er*/*est purple star*). We hypothesized that during incremental interpretation participants will predict that a head noun will follow the first adjective (e.g., *the small*/*er*/*est* [N]), a prediction that must be discarded once the second adjective is processed. This hypothesis comes from the fact that one adjective phrases are more common than two adjective phrases (e.g. (# of small green)/(# of small) = 0.0009 in the COCA corpus). To ensure that one-adjective alternatives were salient to our participants, fillers and no competitor conditions were included in both experiments where only gradable adjectives were present and sufficient to pick out the referent in the display. We also hypothesized that the interference of the failing alternative should be further modulated by the lexical semantics of the predicate. The positive-form (POS) adjectives (e.g., *small*) should show more interference than comparative (COMP) and superlative (SUP) adjectives (e.g., *smaller*/*est*) due to their higher context-sensitivity [1,2]. To determine whether the suppression of the one-modifier alternative is costly, we test the two-modifier descriptions against Comparison Classes (CCs) where the one and two-modifier alternatives each pick out a different referent (Fig. 1). We show that suppressing a non-viable alternative lowers a description's acceptability, and that this interference is modulated by the semantics of the scalar predicate. **Exp. 1** (N=84) was an acceptability task where participants saw sentences like "*This is the* [size Adj.] [color Adj.] [N]" alongside visual displays where the intended target was underlined (Fig. 1). Half of the experimental trials were *no-competitor* trials which consisted of 2 or 3 objects matching in shape and color, but differing in size. The other half of the experimental trials were *competitor* trials, which consisted of the no-competitor displays plus an additional object of a different size *and* color (3 or 4 objects total) that could serve as the referent of the alternative (failing) one-adjective description (e.g., *the small star*). To maximize comparability, POSs were tested against COMPs and SUPs in scenes with picture cardinalities of 2 (no-competitor) or 3 (competitor) and 3 (no-competitor) or 4 (competitor) respectively (Fig. 1). **Results 1:** All conditions received high ratings (>6) (Fig. 2A) but by-participant *z*-scored judgments displayed lower acceptability ratings in competitor conditions compared to no-competitor conditions (Fig. 2B, $p<0.05$). Two mixed-effects models predicting *z*-scored judgments from Adj. Type, CC Type and their interaction were fitted to the data corresponding to the POS (3 Pics)/COMP and POS (4 Pics)/SUP respectively. A significant interaction was found in both cases (p's<0.05). **Exp. 2** (N=30) tested the same stimuli as Exp1 and consisted of an incremental decision task [3, 4] where each word in the description was added one word at a time (Fig. 3A). Participants clicked on the picture they thought the phrase referred to and the next word of the description was added. **Results 2:** Fig. 3B shows the normalized proportions of clicks to target and competitor in the size adjective critical region where the failing alternative is hypothesized to arise. A generalized mixed-effect logistic regression showed that target selection rates were significantly above chance for COMP and SUP adjectives ($p<0.05$), but not for POS (3/4 pic) conditions ($p>0.05$). However, simple effect comparisons revealed that POS (3 pic) received significantly more clicks to the competitor than COMP ($p<0.05$), but no significant difference was detected for POS (4 pic) vs. SUP ($p>0.05$). **Discussion:** Exp1 indicates that the presence of a competitor lowers acceptability judgments and that this penalty is stronger for POS than for COMP or SUP. Exp2 shows that overall this can be explained by the failing alternative descriptions entertained during incremental interpretation, as measured by competitor selections. Finally, we hypothesize that the higher cardinality of matching-color objects in the POS (4 pic) condition increases the visual salience of the competitor. This may underlie the lower competitor selection rates observed in Exp2 for this condition compared to POS (3 pic), as participants may have preferred to describe this object using the color property (e.g., *The green star*), rather than size. Taken together, our results help us constrain the space of plausible interactions between grammar and processing, and further our understanding of how such interactions feed into offline acceptability judgments.

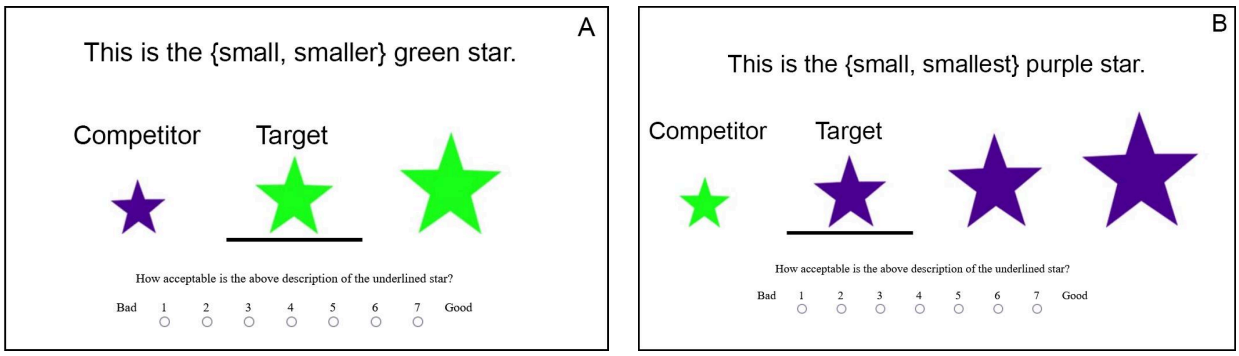

Figure 1. A: Exp1 3-picture sample display for the competitor condition ; **B:** Exp1 4-picture sample display competitor condition. No-competitor conditions differed only in the removal of the competitor shape and the removal of the color adjective from the stimulus sentence.

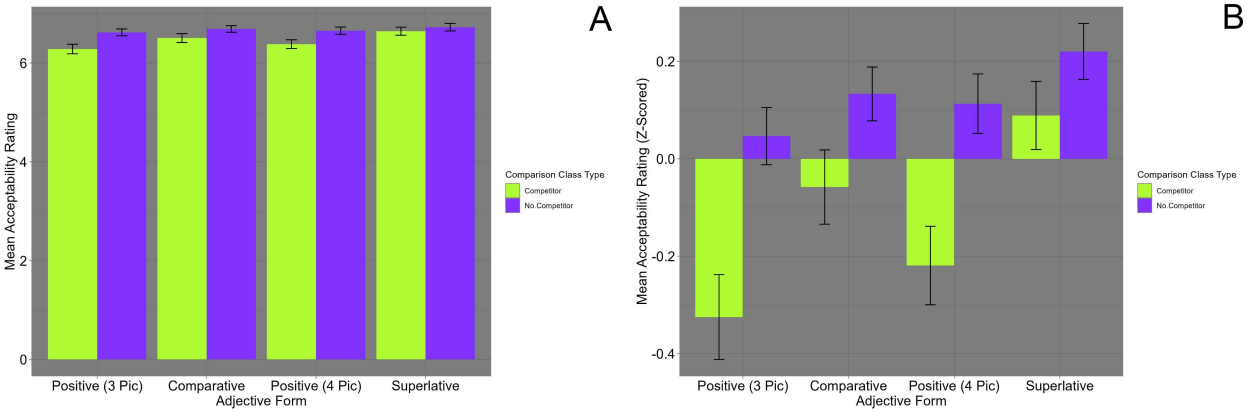

Figure 2. **A:** Exp1 Mean Acceptability Ratings; **B:** Exp1 Normed Mean Acceptability Ratings.

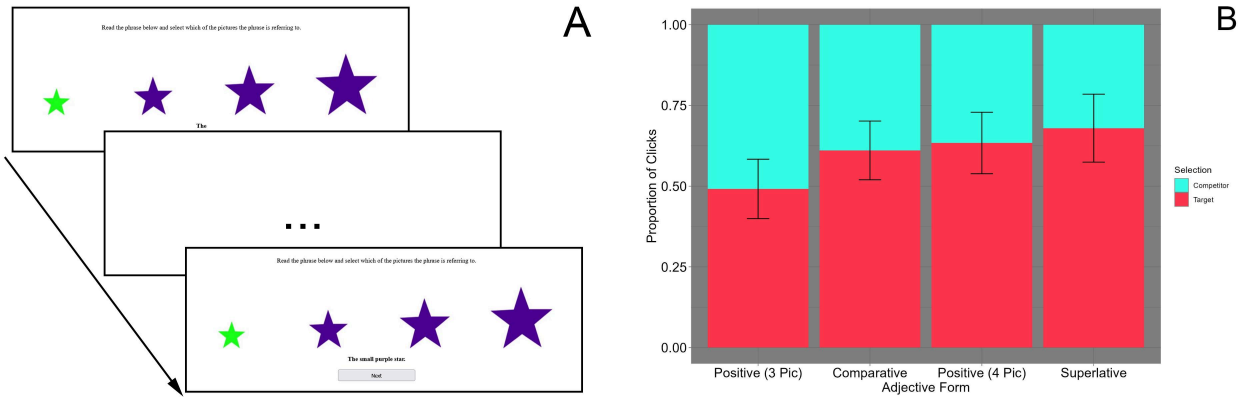

Figure 3. A: Exp2 trial example; **B:** Exp2 Target and Competitor normalized click proportions in the size adjective region.

References [1] Aparicio et al. (2021), *Proceedings of Semantics and Linguistic Theory*, 31. [2] Aparicio et al. (To Appear), *Glossa Psycholinguistics* [3] Qing et al. (2018), *Proceedings of the Annual Meeting of the Cognitive Science Society*, 40. [4] Allopenna et al. (1998), *Journal of Memory and Language*.