

An Experimental Investigation of Anti-presuppositions

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Summary The aim of this paper is to assess whether inferences resulting from violating the principle *Maximize Presupposition* behave differently from presuppositions and implicatures, thus testing predictions of theories which separate those inferences out from these more well-studied aspects of meaning (Sauerland 2008, Percus 2006). We present data from a picture selection task on the English indefinite/definite determiner. Based on the findings we argue that 1) the epistemic status of anti-uniqueness inferences is much weaker than the uniqueness presupposition of the definite or implicature raised by the indefinite, and 2) drawing these inferences requires more effort than not drawing it or calculating presuppositions or implicatures.

Theory It has been observed that presupposition triggers have to be used if their presupposition (PSP) is fulfilled in the context. Heim (1991) proposed an account based on the principle *Maximize Presupposition* (MP). According to theories working with MP, PSP triggers are ordered on a scale of a presuppositional strength with their non-presuppositional counterparts (Percus 2006, Chemla 2008). One of these scales orders the definite and indefinite determiner. The indefinite yields the inference that the PSP of the definite is false ("anti-uniqueness") due to this competition, which is why it is infelicitous in (1).

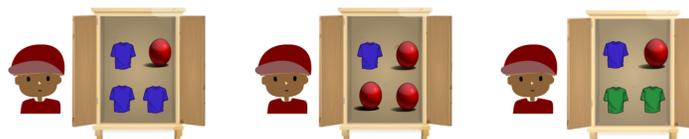
(1) {The / # A} father of the victim came.

Anti-presuppositions have been argued to be distinct from both PSPs and implicatures since they are epistemically weak and project out of negation (Sauerland 2008). The weak status of anti-uniqueness is reflected by the fact that while the use of an indefinite in (1) allows for the inference that it is not certain that there is exactly one father, this cannot be strengthened to mean that it is certain there is not exactly one father. Alternative views on the competition between the definite and indefinite are that they both come with their own context restrictions, i.e. that the indefinite comes with a novelty condition (Heim 1982) or its own PSP of anti-uniqueness (Kratzer 2004). These make different predictions for the processing profiles associated with anti-uniqueness.

Experiment The first factor manipulated for the study was the type of DETERMINER used in the sentences and had four levels, see (2): In addition to indefinites and definites, numerals were included in both focused and unfocused versions, both to provide another point of comparison and for future cross-linguistic extensions.

(2) {A/ The/ One/ ONE } shirt in Benjamin's closet is blue.

Determiner-type was a between subjects factor to avoid intra-experimental competition effects. Sentences were presented auditorily along with one of three display conditions. Each display contained two of the three critical pictures below (SAMECOLOR, SINGLEITEM, DIFFCOLOR), as well as a distractor. Critical pictures varied in whether they satisfied a uniqueness presupposition (b vs. a,c), an implicature that there be at most one relevant item of the mentioned color (b,c vs. a), and an anti-uniqueness inference that there is more than one relevant item (a,c vs. b).



(a) SameColor

(b) SingleItem

(c) DiffColor

Condition A paired SAMECOLOR and SINGLEITEM, picture condition B had SINGLEITEM and DIFFCOLOR and condition C had SAMECOLOR and DIFFCOLOR. The distractor showed 4 other identical items. The participants' task was to choose the picture that best fit the sentence they heard. In addition to responses and reaction times, eye movements were recorded for a more detailed perspective on the unfolding of various components of interpretation. 120 students of the University of Pennsylvania participated in the experiment for credit.

The results were analysed with linear mixed effect models using the lmer function in R. We first looked at rates of picture choices and reaction times. For condition A, participants chose picture SINGLEITEM over SAMECOLOR at ceiling level across determiners (with no significant RT differences), in line with the definite's uniqueness presupposition and the indefinites' implicature that there be only one blue shirt.

Det	SAMECOLOR	SINGLEITEM	RT
the	6%	94%	3230
A	2%	98%	3180
one	5%	95%	3288
ONE	3%	97%	3290

Condition A

Det	DIFFCOLOR	SINGLEITEM	RT
the	5%	95%	3470
A	25.4%	74.6%	3950
one	42.6%	57.4%	3870
ONE	45.5%	54.5%	3228

Condition B

In condition B, SINGLEITEM was chosen at ceiling levels for the definite, in line with its uniqueness presuppositions. The percentage of DIFFCOLOR choices over SINGLEITEM choices in condition B differed significantly from definites for all indefinites ($p < .01$). Moreover, compared to condition A the percentage of SINGLEITEM choices for indefinites went down significantly in condition B where the competitor was DIFFCOLOR. This effect was more pronounced for "one" than for "a". Choosing DIFFCOLOR over SINGLEITEM is, of course, in line with anti-uniqueness. An additional relevant effect emerged in RTs, such that the choice of picture DIFFCOLOR took significantly longer than the choice of SINGLEITEM for all indefinites. Choosing SINGLEITEM with indefinites also took significantly longer in condition B than it did in condition A. Together, these points suggest that choosing the picture verifying anti-uniqueness involved additional effort. This is also supported by preliminary analysis of the eye-tracking data, which suggest that looks to the target stabilized faster in condition A than in condition B. For condition C, DIFFCOLOR was chosen over SINGLEITEM at ceiling levels for all determiners, with no differences in RT.

Conclusion: We found first experimental evidence for anti-presuppositions ("anti-uniqueness"). Our data support views that theoretically separate these inferences from PSPs and implicatures. First, the picture choices suggest that the epistemic status of anti-presuppositions is much weaker than that of implicatures or PSPs. Participants relatively rarely based their picture selection on anti-uniqueness being fulfilled, compared to implicatures and PSPs, which were quite consistently considered. Second, both the RT and preliminary eye-tracking data suggest that drawing this inference is cognitively more demanding than calculating PSPs or implicatures. We also found that anti-uniqueness effects are stronger for numerals than indefinites, raising the question of what additional factors, beyond the competition with the definite, play a role in deriving these inferences.

Selected References • Bade 2016. *Obligatory Presupposition Triggers in Discourse*. PhD.thesis • Heim 1991. Artikel und Definitheit. In *Handbook of Semantics*. • Percus 2006. Antipresuppositions. In *Theoretical and Empirical Studies of Reference and Anaphora* • Sauerland 2008. Implicated presuppositions. In *Sentence and Context*, DeGruyter.