

No bone but a button – Negation and the search for referents in a visual world

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We report a study that was conducted under our supervision by a group of B.Sc. Psychology students (Neele Alberts, Constanze Hoffmann, Lisa Kolb-Gessmann, and Karina Schauder). The aim of this study was to assess whether participants predict upcoming referents in a visual world based on pragmatic reasoning. Similar to Wason (1965), negated sentences were presented together with visual worlds that provide felicitous or infelicitous contexts for these negated sentences. Sentences with negation usually refers to something that constitutes an exception, a deviation from the default condition. In biased displays, where one object is the only different one among many same objects, using the negation particle “not” should allow to predict the upcoming object prior to encountering the referent in the sentence referring to the minority object (see Figure 1 middle display: “*Tap on the girl, who has no bone*”). However, this is not possible in unbiased displays (left display in Figure 1), as there is no such minority object.

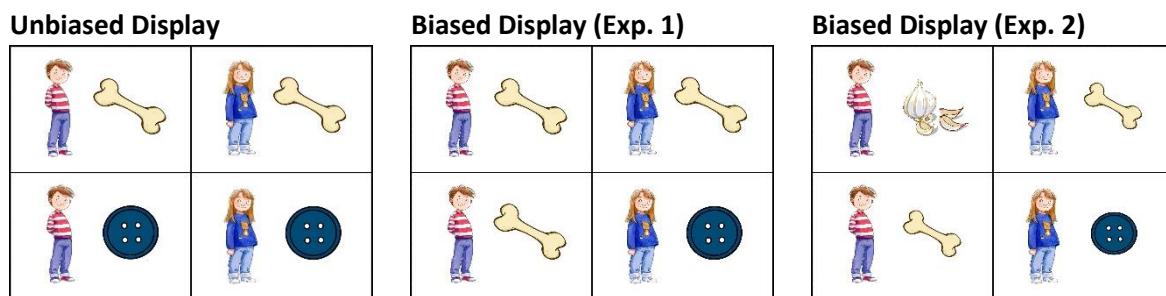


Figure 1. Display versions for the minority object “button”. Affirmative and negated sentences referred to either the girl with the button (“*Tap on the girl, who has a button / no bone*”) or the girl with the bone (“*Tap on the girl, who has a bone / no button*”).

We conducted two experiments. In Experiment 1, we used an unbiased display (Figure 1, left) and a strongly biased display (Figure 1, middle). In Experiment 2, the strongly biased display was replaced by a display still having a bias, but reducing the saliency of the minority object (see Figure 1, right). Participants read affirmative and negative prompts referring to either the girl with the button or to the girl with the bone. In the following, we will only discuss the predictions and results for affirmative and negative prompts referring to the “minority object” (the girl with the button in all displays).

We predicted that negative prompts in particular would gain strongly from a biased display (constituting a pragmatically felicitous context for the negation) relative to an unbiased display (constituting a pragmatically infelicitous context for the negation). Thus, we expected an interaction between polarity and display, with shorter response times in the biased compared to the unbiased displays for negative prompts especially. Contrary to this prediction, the results of Experiment 1 showed a main effect of display and polarity, but no interaction. Reaction times were faster after affirmative prompts, and they were faster with the biased display independent of polarity. Thus, contrary to our hypothesis, participants did not seem to predict the upcoming referents based on pragmatic reasoning specific to the use of negation. Critically, the identification of the target object by pragmatic reasoning might be superimposed by another effect, which might be due to the structure of the biased displays used in Experiment 1. Here, the minority object is highly salient which might initially draw the participant’s attention to this object (pop out effect). Possibly, participants considered the minority object as a “starting point” or a salient reference point to

describe the objects in the display, which would explain the RT outcomes. In Experiment 2, we therefore changed the biased displays to reduce possible pop out effects. This allowed us to assess whether the results of Experiment 1 can be explained by the saliency of the minority object. Indeed, with the new biased display, there no longer was an effect of display. Again, there was an effect of polarity, due to identification following negation taking longer, whereas there was no interaction between polarity and object type in the biased display. Thus, negation does not seem to facilitate the identification of a minority object, suggesting that in the current study participants do not predict upcoming referents in a visual world based on pragmatic reasoning specific to negation. Implications of present results and future directions will be discussed.

References

- Wason, P. C. (1965). The contexts of plausible denial. *Journal of Verbal Learning and Verbal Behaviour*, 4, 7-11.