On the processing of "might"

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Summary. This study examines the processing of the implicature of *might* (≈ NOT *must*). Our results show that the implicature does not emerge until 800ms after *might* is heard, and hence support the view that implicature processing is delayed.

Introduction and Methods. The literature on implicatures contains both studies that suggest rapid computation of scalar implicatures (Sedivy et al., 1999; Grodner et al., 2010), as well as ones that provide evidence for extra processing costs in generating them (Noveck & Posada, 2003; Huang & Snedeker, 2011). The present study extends existing work by comparing *might* to *must* (as opposed to the standard *some* and *all),* and by adapting a paradigm that integrates experimental sentences into a natural discourse within a game.

The experiment employed the visual world paradigm, using a guessing game with a confederate. In critical trials, subjects had full access to a visual display of 9 colored shapes, while the confederate had only partial access. The shapes were arranged according to 2 rules (1), based on which the confederate had to "guess" the hidden shapes. Critical trials were scripted for maximal experimental control. The subjects' task was to verify the guesses.

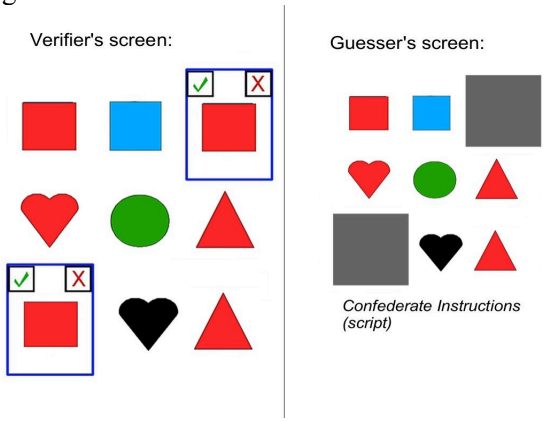
Eye movements of 12 participants were recorded while the confederate made guesses regarding the hidden shapes, which used either *must* or *might*, depending on whether the rules provided certainty about the shape in question (see Fig. 1) Up to the location phrase (*upper right*), nothing but the choice of modal provided information about which of the two hidden shapes the statement was about. Guesses for *must* sentences were always correct, while guesses for *might* sentences were incorrect (but consistent with the rules) half of the time.

Predictions. If the pragmatic implications of might are directly accessed and are part of its meaning then we would expect *might* to block eye movements to the shape that can be guessed with certainty, and trigger eye movements to the shape that cannot be guessed with certainty. If uncertainty is an implication of *might* we should see some delay in selecting the shape that cannot be guessed with certainty.

Results. Target advantage scores (looks to target minus looks to competitor) were computed for the experimental conditions, split by whether the guess was correct or not (see Fig. 2 for correct guess data). The target was the shape that could be guessed with certainty (upper right in Fig. 1), and the competitor the shape that could not be guessed with certainty (bottom left). For items for which the guess was correct, *might* and *must* pattern together until 1s after their onset, and only after that is there a relative increase in looks to the competitor when hearing *might*. This is reflected in a significant interaction between time window (1^{rst} second vs. the rest of ambiguous period) and *must/might*. The delay in incorporating the 'Not *must*' implicature of *might* is comparable to previous studies finding such delays and provides further support for the notion that implicatures incur processing cost, based on different implicature triggers and using an experimental paradigm based on natural dialogue.

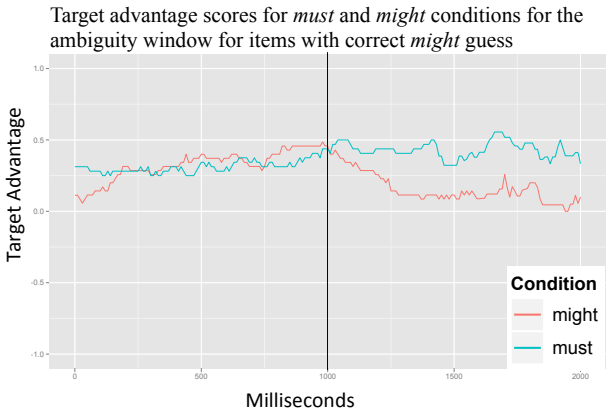
(1) Rules: Rows: 3 alike shapes or all different; **Columns**: 3 same color shapes or all different

Figure 1



1. There **must be** a red square located in the upper right.
2. There **might b**e a red square located in the bottom left.

Figure 2



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