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Authors
German, James
Sagi, Eyal
Kaufmann, Stefan
et al.

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The Effect of the Speaker's Motivation on the Interpretation of Logical Connectives

James German*, Eyal Sagi[a], Stefan Kaufmann*, Brady Clark*, Min-Joo Kim[b]
*Department of Linguistics, Northwestern University, 2016 Sheridan Road, Evanston, IL 60208
({j-german, kaufmann, bzack}@northwestern.edu)
[+] Department of Psychology, Northwestern University, 2029 Sheridan Road, Evanston, IL 60208 (ermon@northwestern.edu)
[a] Department of English, Texas Tech University, Lubbock, TX 79409 (min-joo.kim@ttu.edu)

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Background

Logical connectives like 'or' and 'if-then' have been at the center of research on conversational implicature since Grice (1975). Under the standard account, a sentence like "The strawberry is next to an apple or a lemon" entails that the strawberry is next to an apple or a lemon or both, and yet it implicates that it is not next to both. It is widely assumed that the successful communication of conversational implicatures depends partly on (i) alternative expressions the speaker could have used but didn't, and (ii) mutual beliefs about the goals and rationality of the interlocutors.

Psycholinguists have recently begun to study the processing of implicatures (e.g., Storto and Tanenhaus, in press, Noveck et al. 2002). However, these studies fail to consider the role of contextual factors such as hearers' beliefs about speakers' interests. For example, participants are likely to interpret utterances differently if they believe that the speaker has reason to be deceptive. The study we report here demonstrates that these factors play a significant role in the process of utterance interpretation.

Method

Participants (N=15) were told that a series of games were being played between two players. In each game, the players had hidden a prize behind one of the objects on a 4x4 grid. The participants' task was to identify that object, based on a truthful but ambiguous verbal clue from one of the players (see Table 1). One of the players (the "winner") would get the prize if the participant chose the correct object; otherwise, the other one (the "loser") would get the prize. In each game, the clue was presented as coming from either the winner or the loser. Following this clue, participants could choose among 4 target squares that were either next to both referenced "clue" objects (A), next to only one of the clues mentioned (either A or $\bar{A}$), or next to neither of the clues ($\bar{A}$). Participants received no feedback on their choices. Each participant was presented with a total of 84 games in 4 blocks of 21 games each (7 games for each utterance type).

Results

The pattern of choices, broken down by speaker and utterance type is given in Figure 1. There were reliable differences in the observed pattern of choices for each of the utterance types (*or*: $F(2, 28) = 5.15$, $p < .05$; *not-and*: $F(2, 28) = 122.03$, $p < .001$; *if*: $F(2, 28) = 27.97$, $p < .001$). The choice pattern for '*or*' is highly surprising, as it shows that in certain contexts the implicature typically associated with 'or' ('either A or B, but not both') is not inferred by hearers.

More importantly, there was a reliable 3-way interaction ($F(8,112) = 2.081$; $p < .05$) suggesting that participants' choices varied according to both the utterance and the speaker's role. The 2-way interaction between choices and speaker's role was reliable only for '*if*' ($F(4,56) = 3.01$; $p < .05$). Participants were less likely to make the implicated *AB* choice if the speaker had reason to be deceptive (i.e., the "loser"). These results indicate that the interpretation of utterances is influenced by the hearer's beliefs about the speaker's motivation.

Table 1: Sample utterance set[1]

Connective	Statement
or	The prize is behind a strawberry that is next to an apple or a lemon.
not-and	The prize is behind a strawberry that is not next to an apple and a lemon.
if	The prize is behind a strawberry that is next to an apple if it is next to a lemon.

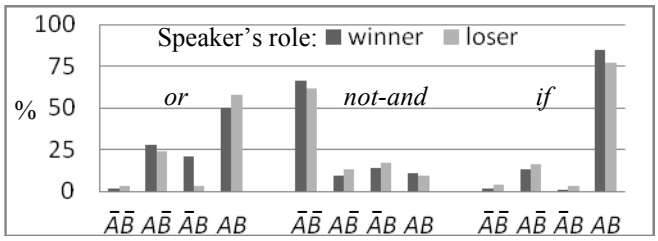

Figure 1 - % responses by utterance type and speaker's role

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[1] In this set, the *A*- and *B*- clues are "apple" and "lemon"