

Robustness of implicatures to wordy and informationally-redundant speakers

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Neo-Gricean approaches (e.g., Levinson, 2000) have famously distinguished types of implicatures, such as *Q*-implicatures as in (1)—derivable from the assumption that the speaker provides the informationally strongest utterance she believes to be true—and *M*-implicatures as in (2)—derivable from the assumption that the speaker does not use awkward formulations to express simple ideas.

(1) John washed some of the sheets. \leadsto not all of the sheets

(2) John caused bleach to go into the washing machine. \leadsto non-normally, e.g., by mistake

Another interesting type are relevance implicatures, which can be derived from the assumption that the speaker's message is sufficiently relevant to warrant the listener's attentional resources (Sperber and Wilson, 1995). An example are *habituality inferences*, or *H*-implicatures, which are triggered by speakers producing contextually redundant utterances as in (3). Given general world knowledge (more precisely script knowledge), there is usually no need to explicitly mention a paying event. If listeners infer the speaker provided relevant information after all, they could infer that paying is not what John usually or habitually does (Kravtchenko and Demberg, 2015, 2017).

(3) John went shopping. He paid the cashier. \leadsto he doesn't always/habitually pay

If different kinds of implicatures are indeed triggered by assumptions about different aspects of communicatively-optimized speaker behavior, and if listeners are able to track the evidence in favor of these assumptions during extended conversation, we are led to expect that observing a speaker produce a longer stretch of, say, informationally redundant utterances similar to (3), then the rate at which listeners draw *H*-implicatures for informationally-redundant utterances should go down. In this work, we try to investigate exactly these questions, thereby contributing the investigation of how flexibly listeners adapt their pragmatic interpretation to particular idiosyncrasies of the current speaker. In particular, we are interested in comparing the robustness of *H*-implicatures, in comparison to *Q*- and *M*-implicatures, under repeated exposure to redundant utterances.

Experiment. We measure participants' endorsement of *Q*-, *M*- and *H*-implicatures by a binary choice of interpretation in three types of context: redundant, wordy and plain (see example at the end). After reading the context and a fictitious speaker's utterance, participants choose one out of two interpretation options – e.g., for (1), whether John washed *some and possibly all*, or *some but not all* of the sheets. We vary the preceding context of the utterance, by including a long series of redundant speaker utterances in the *redundant* condition, a long series of informative utterances in the *wordy* condition (primarily to control for the *redundant* condition length), and a brief opening in the *plain* condition. Materials consisted of 6 vignettes, which could variably end in a *Q*-, *M*- or *H*-implicature trigger, and could variably instantiate any of the 3 context conditions. Participants read each vignette, with a pseudo-randomized assignment of implicature and context type.

Predictions. We clearly expected lower rates of *H*-implicatures in the redundant than in the plain condition. The rest of our predictions were more speculative, owing to the exploratory nature of this investigation. Still, we tentatively expected the wordy condition not to influence *H*-implicatures, at least not to the same extent as the redundant condition. We expected *Q*-implicatures not to be (strongly) affected by either redundancy nor wordiness. As for *M*-implicatures, we could have imagined that wordiness and redundancy leads decrease implicature rates because both could be interpreted as signals that the speaker might not strictly optimize production effort.

Results. 250 native speakers of US English were recruited via Prolific. After removing data from participants who answered any of the six control questions incorrectly, data from 135 participants

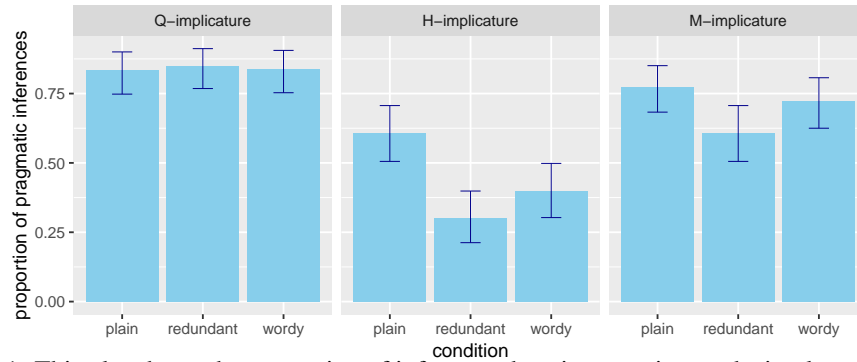


Figure 1: This plot shows the proportion of inferences by trigger variety and stimulus condition.

was entered into the analysis. We used a Bayesian hierarchical logistic regression with the maximal random effects structure to regress the proportion of implicature choices against factors *CONDITION* (plain, redundant, wordy) and *IMPLICATURE* (*Q*, *M*, *H*) and their interaction. We investigated the effect of *CONDITION* for each kind of implicature. We judge there to be a credible difference between conditions if their posterior probability is at least 0.95 that the predictor value for one condition is bigger than that of another. Credible differences were found only for *H*-implicatures, where both the wordy and redundant conditions elicit lower implicature rates than the plain condition.

Interpretation. We submit that these results are interesting for a number of reasons. First, they show that, in principle, listeners do adapt specific pragmatic interpretations to specific apparent idiosyncrasies of the speaker. Second, as expected, exposure to a repeatedly redundant speaker decreased *H*-implicature rates. Nonetheless, these results also raise issues for further investigation. For example, while we tentatively expected that the wordy condition might not (strongly) influence the rate of *H*-implicatures, we are led to conclude that the rate in that condition is comparable to that of the redundant condition. This may be due to decreased trigger prominence, or it may be due to listeners being already satisfied with the amount of relevant information they have received from the whole contribution of the speaker. Further work is needed to disentangle the contributions of redundancy vs. decreased discourse prominence.

[EXAMPLE OF MATERIALS] **Context:** John often goes to the grocery store around the corner from his apartment. Recently, he came home from the store with groceries. When he came in, he saw his roommate Susan in the hallway, and started talking to her about his day. As he went to the kitchen to put his groceries away, Susan went to the living room, where their roommate Peter was watching TV.

Redundant: Susan said to Peter: “John just came back from the grocery store. Earlier in the morning he drove to the pharmacy. He went in, and found a pharmacist. He paid the pharmacist for his prescription. He put the prescription in a bag. He then left and drove to the store. He paid the cashier”

Plain: Susan said to Peter: “John just came back from the grocery store. He paid the cashier.”

Wordy: Susan said to Peter: “John just came back from the grocery store. Earlier in the morning he drove to the pharmacy. When he went in, the pharmacist couldn’t find his medication. They ordered it for the next day. He then left and drove to the store. He paid the cashier.”

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