It isn't usually like that: knowledgeability and negation in inferencing

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Introduction

When speakers use language transparently, their intended meaning maps directly onto the form used, but language can also be used non-transparently, such that addressees must draw inferences beyond the speaker's explicit message. To address the question of how addressees determine message transparency, we present two studies investigating effects of speaker knowledgeability and utterance form on comprehenders' *recognition of transparent language*.

As competent language users we have expectations about how communicative interactions should proceed and how utterances should be packaged (Grice, 1975; Levinson, 2000). Violations of these expectations can prompt addressees to compute additional meaning, inferences, to reconcile their expectations for newsworthiness with the speaker's contribution (e.g. Kravtchekno & Demberg, 2015; Rohde, Futrell, & Lucas, 2021): e.g., offering a "yellow banana" may sound unusual since the typical yellowness of bananas means that property can often be left unspecified (Levinson, 2000; Westerbeek et al, 2015). Speakers include optional modifiers more often to describe situations with atypical properties: *pink* banana not *yellow* banana (Westerbeek et al., 2015). When such specifications are absent, addressees can and do draw inferences that the content left unsaid represents typical, unremarkable information. However when present, addressees reason about why the content was included. For "yellow banana", addressees may infer the presence of another non-yellow banana that would have made unmodified "banana" ambiguous (Sedivy, 2003).

Speaker knowledgeability affects inference derivation; violations of informativity trigger greater inferencing when produced by knowledgeable speakers (Bergen & Grodner, 2012). When knowledgeable speakers' utterances violate addressees' expectations of cooperativity and informativity, addressees derive *informativity inferences* (Kravtchenko & Demberg, 2017). Utterance form may influence the types of inferences drawn: e.g., negation may indicate a deviation from what is typical since speakers rarely talk about the absence of something unless its absence is relevant (Bonnefon & Villejoubert, 2007; Givón, 1979; Nordmeyer & Frank, 2014).

The present study asks (1) how addressees interpret negation and (2) how negation interacts with speaker knowledgeability. If negation is interpreted as a signal of violated expectations, this violation should prompt addressees to interpret utterances containing negation as conveying more than transparent facts about the world; addressees may infer that things are usually *not* as stated. Furthermore, the strength with which these interpretations arise should be affected by a speaker's knowledgeability about a topic. When a knowledgeable speaker uses negation, the interpretation that the uttered fact is not usually the case should be stronger than when uttered by an unknowledgeable speaker.

Methods

Participants saw text-message conversations about two fictional locations[1]. Speaker knowledgeability was manipulated such that messages referred to a familiar location (Holiday Exp1, Home Exp2) or an unfamiliar location (Layover Exp1, Holiday Exp2). Speakers are likely to

[1] Materials: https://osf.io/q8t9a/?view_only=d7a65e3e33e14ea188291947468a4679

have expectations about how things usually are in familiar locations but not in unfamiliar locations. Consequently, utterances about unfamiliar locations are likely to be considered as transparently conveying facts about that location. For example, stating "There is snow" somewhere you are unfamiliar with would not license any additional inference that depends on your knowledge of how things usually are there. In contrast, if a speaker is talking about a familiar location, and is assumed to be cooperative and informative, then an addressee is in a position to infer additional information, i.e., *it does not usually snow.*

Utterance form was manipulated through the presence/absence of negation (e.g. "There's [no] snow"). "There's no snow" can be interpreted as transparently conveying a fact about how the world is at that moment. However, the presence of negation may also indicate that the speaker expected there to be snow and that the violation of those expectations renders it newsworthy to talk about the absence of snow. This interpretation is licensed provided the speaker knows how things usually are. Conversely, the positive utterance "There's snow" when uttered by a knowledgeable speaker may convey that usually there is not snow or that the situation has recently changed. The 2 x 2 design (Knowledgeability x Utterance form) was counterbalanced such that each participant only saw a single conversation per location.

To assess participants' interpretations, they were asked what the case is usually (Does it usually snow?). For negated utterances ("There's no snow"), positive responses (yes, it usually snows) indicates participants have interpreted the utterance as conveying additional information, i.e. the situation is usually different; negative responses (no, it does not usually snow) indicates a transparent interpretation. For positive utterances ("There's snow"), the opposite pattern holds: positive responses indicate transparent interpretations and negative responses indicate inferencing.

If the rate at which addressees draw inferences is sensitive to speaker knowledgeability, the familiar location should yield greater rates of non-transparent (inference) interpretations. Furthermore, if the presence of negation is another cue that can support addressee inferencing, it is predicted that negated utterances will yield greater rates of non-transparent (inference) interpretations.

Experiment 1

Results

We analysed the binary responses (inference/transparent) from 408 fluent English speakers in R (Version 4.0.3, R core team, 2020) using lme4 (Version 1.1-23; Bates, et al. 2015) using the maximal model allowing for convergence.[2] Figure 1 shows the proportion of inference responses by location and utterance form. The model showed a main effect of utterance form (β=2.42, SE=.15, z=15.96, p< .001): participants drew more inferences for negated utterances than positive utterances. There was no effect of knowledgeability (β=.10, SE=.13, z=.78, p=.436).

[2] Response ~ Location * Utterance_form + (1|participant)+(1|question)

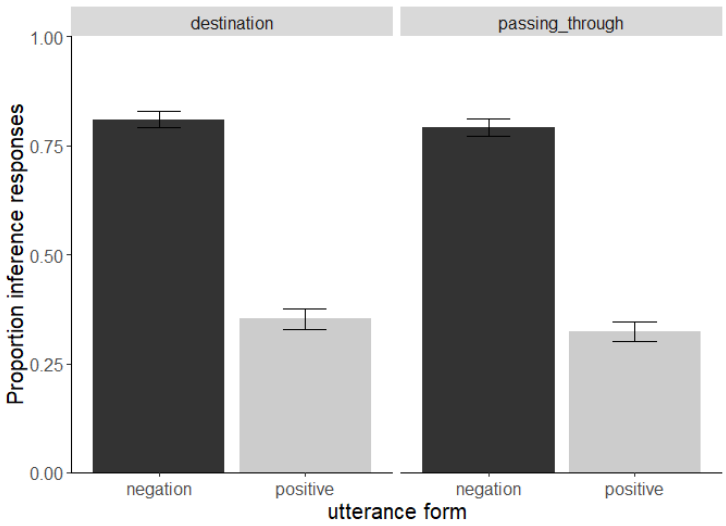

Figure 1. Proportion inference responses.

Experiment 2

We adjusted the knowledgeability manipulation to enhance the contrasting knowledge states. The utterances in Experiment 2 referred to the speaker's home (familiar) or a holiday destination (unfamiliar) and appeared with an image of a speaker. Only the positive utterances from Experiment 1 were used.

Results

Data were analysed as above (N=205). Greater rates of inferencing were seen in the knowledgeable condition (β=-.67, SE=.21, z=-3.19, *p*=.001).

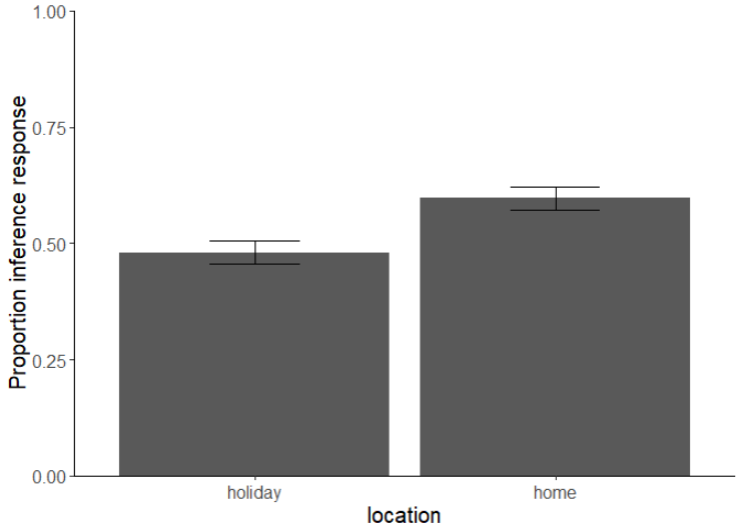

Figure 2. Proportion inference responses.

Discussion

Taken together these results highlight some of the linguistic and extralinguistic cues that addressees consider when interpreting utterances to identify transparent and non-transparent language use. This work points to systematic elements that drive reasoning and to broader questions about how and when inferences are computed beyond those inferences that are more typically studied.

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