

Children's sensitivity to informativity inferences

Short summary

Conversational partners expect each other to communicate rationally and cooperatively with relevant and informative utterances. Occasionally, however, speakers produce seemingly trivial utterances which may violate our expectations of informativity. In adults, we see trivial utterances interpreted as conveying additional information, e.g., implying that the situation has changed in some way. These inferences are more likely when a speaker is deemed as knowledgeable. Here we ask how children deal with seemingly trivial utterances from knowledgeable and unknowledgeable speakers. Preliminary findings (data collection ongoing) suggest that children are less sensitive to speaker knowledge than adults and draw fewer inferences from trivial utterances.

Introduction

We learn a lot about the world through language. Indeed children's learning depends on the language they hear (e.g. Benitez, Leshin, & Rhodes, 2022; Cimpian & Markman, 2011; Rhodes, Leslie, & Tworek, 2012). However, children (and adults) face a complicated task since language is used in a number of different ways – to convey content that informs, persuades, surprises, etc. but also content that extends beyond what has been explicitly said (Grice, 1975; Levinson, 2000). One of the challenges language users face is thus working out speakers' intentions; why did they say what they said rather than something else?

It is understood that speakers should be interesting and add something to the discourse (Grice 1975; Kravtchenko & Demberg, 2020; Sedivy, 2003; Rohde, Futrell, & Lucas, 2021); when this doesn't happen, listeners may try to identify a communicative goal to reconcile their expectations with the input. For example, asking someone to "pass the yellow banana" may result in a contrastive inference: Since bananas are typically yellow, the mention of colour may prompt a listener to reason about why I chose to include this information and to conclude that there's another non-yellow banana present (I-principle, Levinson, 2000, Sedivy 2003). This search for additional meaning encompasses cases where a seemingly trivial utterance ("the walls are blue") invites further conclusions (e.g., that the walls have changed) through a related reasoning process about how the speaker's utterance can be understood to comprise an informative and interesting contribution (an *informativity inference*).

Here we build on recent work on informativity inferences (Kravtchenko & Demberg, 2020; Rees & Rohde, 2023) to investigate how children interpret trivial or mundane utterances. Work from Rees & Rohde (2023) demonstrated that adults are more likely to derive informativity inferences when trivial utterances are produced by knowledgeable speakers. Children's inferences are also known to be sensitive to characteristics of a speaker: Children draw fewer scalar inferences from speakers who are deemed unreliable or unknowledgeable (Moty & Rhodes, 2021; Tomasello & Akhtar, 1995). Children are also sensitive to utterance informativity (Morriseau, Davies, & Matthews, 2015). However, what is trivial to an adult (and therefore an inference-triggering conversational contribution) may be informative for children since children are still learning about the world. Thus, an utterance "tigers have stripes" may be interesting to a child and not violate any conversational expectations, whereas for an adult this may be perceived as a strange contribution (Gordon & van Durme, 2013).

The present study tests how children use speaker knowledgeability in interpreting utterances that violate informativity expectations. From data collected so far, children appear willing to draw informativity inferences but are less affected than adults by speaker knowledgeability.

Method

Participants (children on Zoom, adults via Qualtrics) were introduced to a speaker “Suzy” who is talking to their dad about their day (see Figure 1). Speaker knowledgeability was manipulated by the location that Suzy talked about, either a familiar location (school) or an unfamiliar location (the Prime Minister’s offices). Suzy made a statement (e.g. “I saw that the library walls are blue”, read aloud by the experiment for children, presented as text for adults), and participants were asked “What do you think the situation was like several months ago? Same or different?”



Figure 1. Example stimuli. Left panel shows familiar (school) condition. Picture text was read out for children.

In the familiar condition, Suzy’s knowledge of the location invites participants to search for additional meaning that would license the trivial statement, possibly a recent change of state (the walls used to be different); in the unfamiliar condition, the utterance is licensed if participants understand Suzy to just be conveying news about a novel place with novel features.

Each participant saw 25 items: 3 practice and then for each location, 10 critical utterances and an attention check item. Item presentation was blocked and counterbalanced; half the participants received the familiar location first.

Results

We currently have data from N=35 adults and N=15 children (aged 6-8 years).

We analysed the binary responses (“same”/“different”) in R (Version 4.0.3, R core team, 2020) using lme4 (Version 1.1-23; Bates, et al. 2015) with the maximal converging model. Figure 2 shows the proportion of inference responses by Speaker Knowledge and Participant Type. We replicate prior findings on Speaker Knowledge: Participants drew more inferences in the familiar than unfamiliar condition ($\beta=1.420$, $SE=.316$, $z=4.487$, $p<.001$). There was no effect of Participant Type ($\beta=.225$, $SE=.332$, $z=.767$, $p=.499$). We do however see an interaction whereby the effect of Speaker Knowledge is smaller for children than adults ($\beta=-1.693$, $SE=.627$, $z=-2.698$, $p=.007$). Pairwise comparisons show an effect of speaker knowledge for adults ($\beta=-2.267$, $SE=.362$, $z=-6.258$, $p<.001$) but not children ($\beta=-.574$, $SE=.516$, $z=-1.112$, $p=.682$).

While we avoid drawing strong conclusions from a small sample, the data at the moment suggest that children are able to draw informativity inferences at rates similar to adults (no effect of Participant Type) but are less sensitive to Speaker Knowledge (Speaker Knowledge x Participant Type interaction).

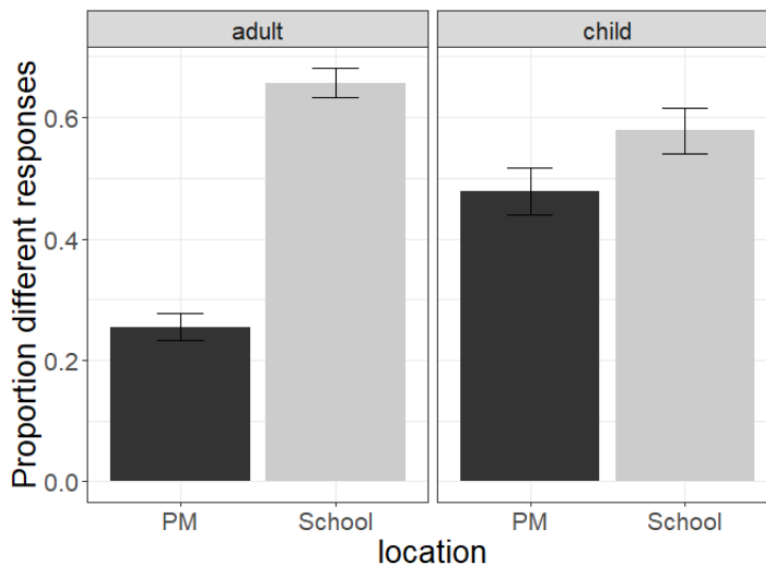


Figure 2. Proportion of “different” responses by location and participant type. Responding “different” is consistent with an inference response.

Discussion

In this work we looked at expectations for informativity and how listeners interpret utterances that violate their expectations. We found that when utterances fail to be sufficiently informative, participants often draw inferences. Specifically, listeners infer that the usual state of the world is different from what was stated; that the speaker produced a trivial utterance to convey additional information about a change. For adults, these informativity inferences arise more when the speaker is knowledgeable about the situation. The effect of knowledge was not borne out statistically in children, but numerically the results pattern similarly to adults.

Data collection is ongoing, but so far, children appear to be adult-like in expecting speakers to produce informative utterances; when confronted with trivial utterances, children will engage in pragmatic reasoning. The children in the present study were at least 6 years old and so their adult-like behavior is not necessarily surprising since by 6, children have a solid grasp on how language is typically used and they are able to engage in sophisticated pragmatic reasoning. We aim for a larger sample size, crucially with a broader range of ages.

This work extends traditional investigations in pragmatic inferencing by moving beyond that of scalar implicature since many of the inferences that arise during the course of interaction are not limited to scalar terms. Overall the studies presented here demonstrate that listeners have pervasive expectations of cooperativity and if conversational contributions fail to satisfy these expectations, then adults (and children) will engage in sophisticated reasoning to reconcile the mismatch in informativeness.

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