Expectations about upcoming content: The role of the addressee

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100-word short summary:

Research on typicality shows seemingly contradictory patterns: comprehenders anticipate real-world typical content (Kamide et al. 2003) but this is less frequent in speakers' productions (Brown & Dell 1987). However, recent work shows evidence of comprehenders' attention to speaker preferences, apparent in their anticipation and processing of non-typical content (e.g. Rohde et al. 2021, 2022). Additionally, the more the speaker's role as an intentional communicator is emphasised, the more comprehenders expect contributions about non-typical content, i.e., content that is cooperatively informative (Authors, submitted). Here, we show that this informativity expectation is modulated by whether the addressee is an adult or child.

Abstract:

Comprehenders rely on real-world knowledge when anticipating upcoming words, such that content that is typical and plausible is favoured. For example, Kutas and Hillyard (1980) showed increased processing cost for sentences such as 'taking a sip from the *transmitter'* compared to the more plausible 'taking a sip from the *waterfall'*. Similarly, Kamide et al. (2003) showed that comprehenders expect utterances to convey real-world typical content; when shown e.g. a scene depicting a man, a girl, a carousel and a motorbike, upon hearing "The man will ride the" participants made anticipatory looks to the more typical continuation, the motorbike. However, production studies show that speakers often omit typical content in places where they could mention surprising content. For example, speakers mention atypical instruments more than typical ones (*ice-pick* over *knife* when retelling a stabbing event; Brown & Dell 1987, Lockridge & Brennan 2002) and remark on atypical rather than typical features (*wool* bowl over *ceramic* bowl; Mitchell et al. 2013).

This apparent mismatch between speakers' behaviour and comprehenders' expectation is unexpected if we assume (following Grice 1975) that comprehenders are sensitive to speakers' production preferences. A possible explanation for this discrepancy is that the participants in the comprehension studies discussed above are not treating the 'speakers' as fully-fledged intentional communicators.

Recent work addresses this apparent gap and shows that comprehenders' expectations are guided by what speakers produce (Rohde et al. 2021, Rohde et al. 2022, Kravtchenko & Demberg 2022). In particular, increasing the emphasis on the speaker's identity as an intentional communicator causes comprehenders to expect more informative contributions from the speaker (Authors, submitted). This is coherent with a view in which comprehenders readily attribute to intentional agents the goal of sharing cooperatively newsworthy information (see also Rubio-Fernandez 2016). In a sentence continuation task, participants completed utterances mentioning different locations (e.g. "I'm at the beach, and there's _____"). The first part of the study manipulated the salience of the speaker and found that the most speaker-salient condition elicited the most informative continuations. In the second part, this informativity expectation was shown to be modulated based on properties of the speaker (see also Grodner & Sedivy 2011): Participants were familiarised with two different speakers, one who routinely made uninformative utterances (about situation-typical content) and one who produced utterances that were highly

informative (about non-typical content). In the subsequent sentence continuation task, participants expected more informative utterances from the high-informativity speaker compared to the low-informativity speaker.

This emerging body of research thus seems to support the view that adult comprehenders reason about a speaker's goal to be informative when guessing what someone is going to say next and are able to adapt their expectations dynamically, e.g. based on properties of the speaker. The study presented here asks whether comprehenders' expectations are also modulated by who the addressee is - specifically, whether expectations differ when the addressee is a child or an adult. Since children are still learning about the world, their input may be characterised by content that is less informative than that of adults – what may be uninteresting for an adult could be newsworthy for a child. This view is supported by findings from Bergey et al. (2021), who analysed the use of adjectives in a corpus of child-directed speech and showed that speakers comment on typical features of objects more frequently with young children compared to older ones. As such, comprehenders may expect child-directed speech to include less informative content than speech directed to adults. This hypothesis is in line with work showing that parents speaking to their children adapt their speech in other domains, such as using simpler syntax and reduplication (Snow 1972).

Design. In an online experiment, participants (N=100) were instructed that they would see the beginning of phone calls from different speakers made to friends or family and would be asked to complete the speakers' utterances with the word or words the speaker is likely to have said. To test whether comprehenders change their expectations for content based on who the addressee is, target utterances (n=20) varied between being addressed to a child or to an adult, within participants. Utterances were presented in a speech bubble next to a picture of an adult speaker on the phone, and a picture of an addressee including their greeting ("Hello?") appeared to the left of the speaker (Figure 1). Target items mention a location (e.g. "I'm at the park, and there's _____", "I'm at the cinema, and there's _____"). To establish what objects are considered typical in these locations, an independent pre-test asked participants (N=22) to list up to 10 objects likely to appear in each location. The typicality of an object provided in the sentence continuation experiment was then estimated as the proportion of pre-test participants who mentioned that object (e.g., for the train station location, 0.91 and 0.0 for "train" and "delay", respectively). Items were counterbalanced such that across participants, all targets appeared both with a child and an adult addressee. 40 filler items were included, and all items were fully randomised for each participant. If participants expect children's input to be less informative than adults, continuations for the adult-directed utterances should be higher in informativity than those directed to children.

Results. Table 1 shows that continuations for utterances addressed to children mentioned more typical nouns than those addressed to adults (linear mixed effects model with condition as a fixed effect and random slopes and intercepts of condition for participants and items; $p < 0.02$ by model comparison). The use of modification (e.g., "steam train", "a really cute dog") is also significantly higher in adult-directed utterances (linear mixed effect model with condition as fixed effect and random slopes; $p < 0.04$). Prior studies also measured informativity in terms of the proportion of negation used (e.g., "no train") and mean entropy (variability of responses). The results of the current study do show a trend towards less informative continuations for the child-directed utterances also on these two measures; however, these effects did not reach statistical significance.

Discussion. The current study shows that comprehenders' expectations for what someone is going to say next are modulated by who the addressee is; overall, there was a preference for completing utterances to children with more typical nouns and less modification compared to those addressed to adults, indicating a lower expectation for informative content in child-directed speech. Nevertheless, the other measures of informativity did not reveal significant differences between conditions. It may be that these measures are not suitable for capturing some of the relevant differences between the continuations for the adult-directed versus child-directed utterances. Future analyses will therefore explore appropriate relative entropy measures.

Figure 1: Example trials for park and bakery locations

Figure 1 Target item example stimuli. The top panel shows an adult addressee, the bottom panel shows a child addressee.

Table 1:

	Child addressee	Adult addressee
Typicality	0.33	0.29
Modification	0.52	0.56
Negation	0.11	0.17
Entropy	3.31	3.38

Table 1 Mean scores for typicality of responses, use of modification and negation, and entropy scores per condition. Typicality means were calculated via an independent elicitation task, N=22. Entropy, modification and negation were calculated over all the responses for any one location, and then a mean was calculated for each condition.

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