Guesses about **upcoming content** reflect awareness of speakers as **intentional communicators**

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BACKGROUND

COMPREHENSION

Comprehenders make guesses based on **real world knowledge**:

- taking a sip from the *waterfall* > taking a sip from the *transmitter* [1]
- the man will ride the *motorbike* > the man will ride the *carousel* [2]

PRODUCTION

Speakers **omit typical content**, and **include atypical content** when optional to do so:

- stabbing with an *icepick* > stabbing with a *knife* [3]

Comprehenders are aware of this. [4,5]

Tension between what comprehenders prefer and what speakers do

HYPOTHESIS

Comprehenders' guesses about upcoming content depend on (at least) two kinds of expectations: one about the real world and one about speakers' production preferences.

That is, comprehenders should expect the kind of content that cooperative speakers are likely to **mention**, not just the kind of content that is likely to **be the case** in the real world.

EXPERIMENT 1

❓ Are comprehenders' guesses about upcoming content influenced by their awareness of an intentionally communicating speaker?

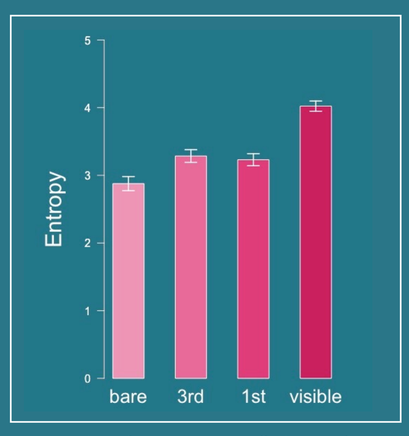
METHODS

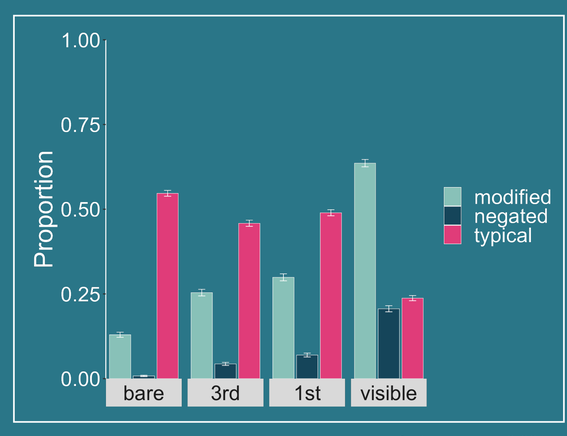
- Sentence completions in a Cloze task about what one can find at 20 different locations (N=400) [6]
- Manipulate the salience of the speaker across 4 conditions:

[bare] At the train station, there's_____
[third person] They're at the train station, and there's _____
[first person] I'm at the train station, and there's ____

[visible speaker]

RESULTS





Higher entropy for visible speaker/first person/third person conditions than baseline bare and also visible speaker>first person; $p<0.001$ with paired Wilcoxon signed-rank tests; highest modification and negation rates for visible speaker, logistic regressions with RE location and participant; $p<0.001$; same pattern as entropy) and lowest typicality (linear regression, $p<0.001$; same pattern)

→ Participants expect more informative content the more aware they are of the speaker

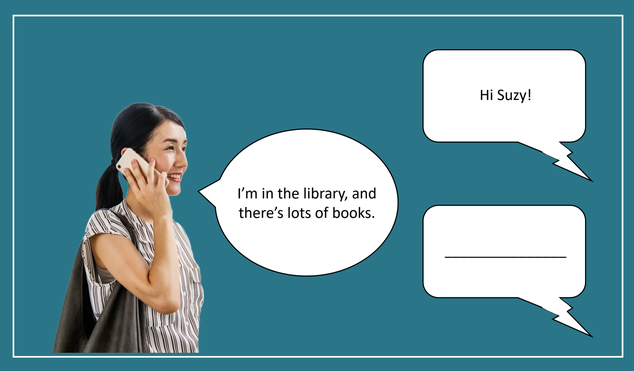
EXPERIMENT 2

❓ Is this expectation for informativity malleable depending on properties of the speaker?

METHODS

- Sentence completions like in Exp1, but with an initial exposure phase, introducing two speakers with different 'filters': chatty v. reticent
- Continuations from Exp1 'bare' and 'visible speaker' conditions as training items

1: EXPOSURE PHASE



Example trial for the chatty speaker

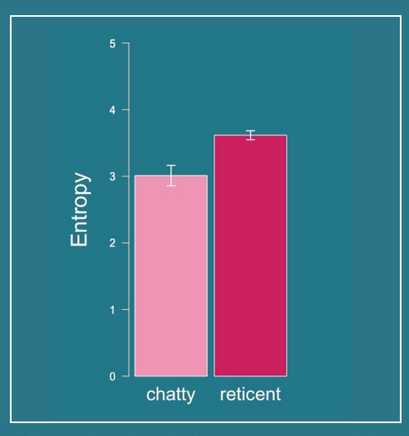
Example trial for the reticent speaker

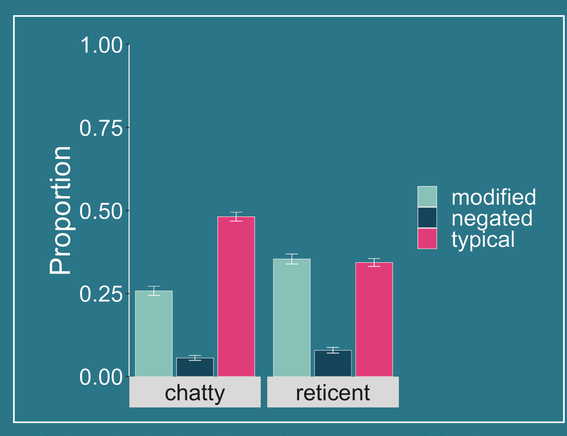
2: TEST PHASE

Example trial for the chatty speaker

Example trial for the reticent speaker

RESULTS





Entropy reticent>chatty, Wilcoxon signed-rank test: $p<0.01$; modification rate reticent>chatty, logistic regressions with RE location and participant: $p<0.001$; negation rate no significant difference; proportion of typical continuations reticent<chatty (linear regression: $p<0.05$)

→ Participants adapt to individual speakers; more informative continuations for reticent speaker compared to chatty

TAKEAWAY

Contrary to what comprehension studies would suggest, comprehenders not only predict real-world plausible content when guessing what words are coming next: they also expect speakers to be informative. Further, this expectation adapts to different speaker styles.

❗ Models of language processing should take into account comprehenders' informativity-driven reasoning about the speaker, including reasoning about individual speaker's preferences for informativity.

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REFERENCES

[1]Kutas, M., & Hillyard, S. A. (1980). Reading senseless sentences: Brain potentials reflect semantic incongruity. *Science*, 207, 203–205.
[2]Kamide, Altmann & Haywood (2003). The time-course of prediction in incremental sentence processing: Evidence from anticipatory eye movements. *Journal of Memory and Language*, 49, 133–156.
[3]Brown, P. M., & Dell, G. S. (1987). Adapting production to comprehension: The explicit mention of instruments. *Cognitive Psychology*, 19, 441–472.
[4]Rohde, H., Futrell, R., & Lucas, C. G. (2021). What's new? A comprehension bias in favor of informativity. *Cognition*, 209, 104491.
[5]Kravtchenko, E., & Demberg, V. (2015). Semantically underinformative utterances trigger pragmatic inferences. *Proceedings of the 37th annual meeting of the Cognitive Science Society*, 1207–1212.
[6]Taylor, W. L. (1953). "Cloze procedure": A new tool for measuring readability. *Journalism quarterly*, 30(4), 415-433.