Lexical processing is not influenced by pragmatic expectations

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Pragmatic cues are often arbitrary and situation specific.
Louise wants to order a sandwich; Arthur wants to buy some sandals.

Linguistic and semantic cues tend to be stable and situation independent.
Sandals and sandwiches can be bought, but only sandwiches can be eaten.

Language comprehenders use both semantic and pragmatic cues to make predictions about upcoming speech. Many theories of language processing treat both kinds of top-down information identically: as constraints that modify subsequent processing, without any specific limitations. Is this correct?

TL;DR: no!

A visual-world eyetracking experiment tested whether pragmatic constraints can modulate phonological competition.
Participants (N=64) completed two blocks of trials, with each block in one of two conditions (counterbalanced).

LOCATION block

Does learning an arbitrary situational cue attenuate lexical competition?

"someone will select the sandwich" test | "someone will select the bike" filler | "someone will select the fire" filler | ***"someone will select the pencil"*** test | "someone will select the goose" filler

target | phonological competitor | NB: these highlights did not appear on participants' displays

etc.

- participants learn to predict target location, always either top left or bottom right
- target name preceded by neutral verb ("select")
- 16 test trials with phonological competitors (e.g., target: sandal; competitor: sandwich); competitors always in 'unfavored' position
- 32 fillers without competitors
- prediction: as block progresses, increased looks to the target prior to onset of critical spoken word (e.g., sandal)

What happens to lexical competition?

SEMANTIC block

Can semantic cues be unlearned, and does doing so enhance semantically-incongruent competition?

"someone will eat the sandwich" test | "someone will stir the bike" filler | "someone will trick the fire" filler | ***"someone will sharpen the pencil"*** test | "someone will polish the goose" filler

target | phonological competitor | NB: these highlights did not appear on participants' displays

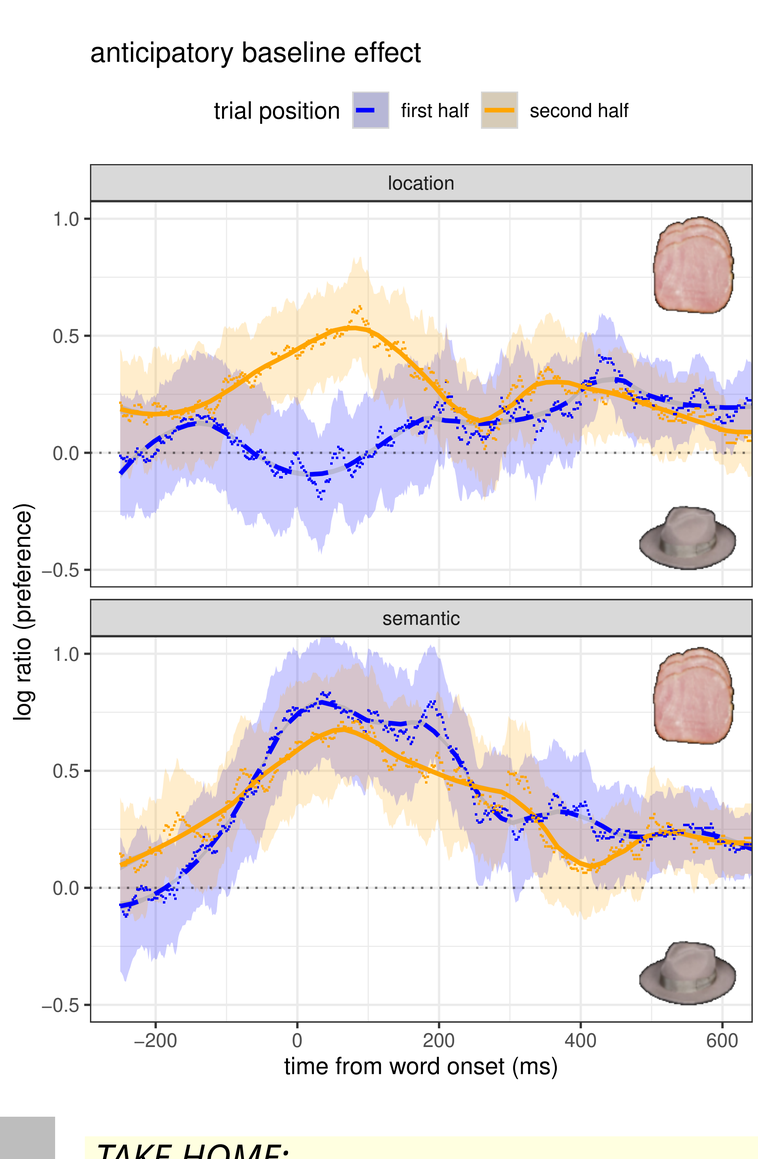
etc.

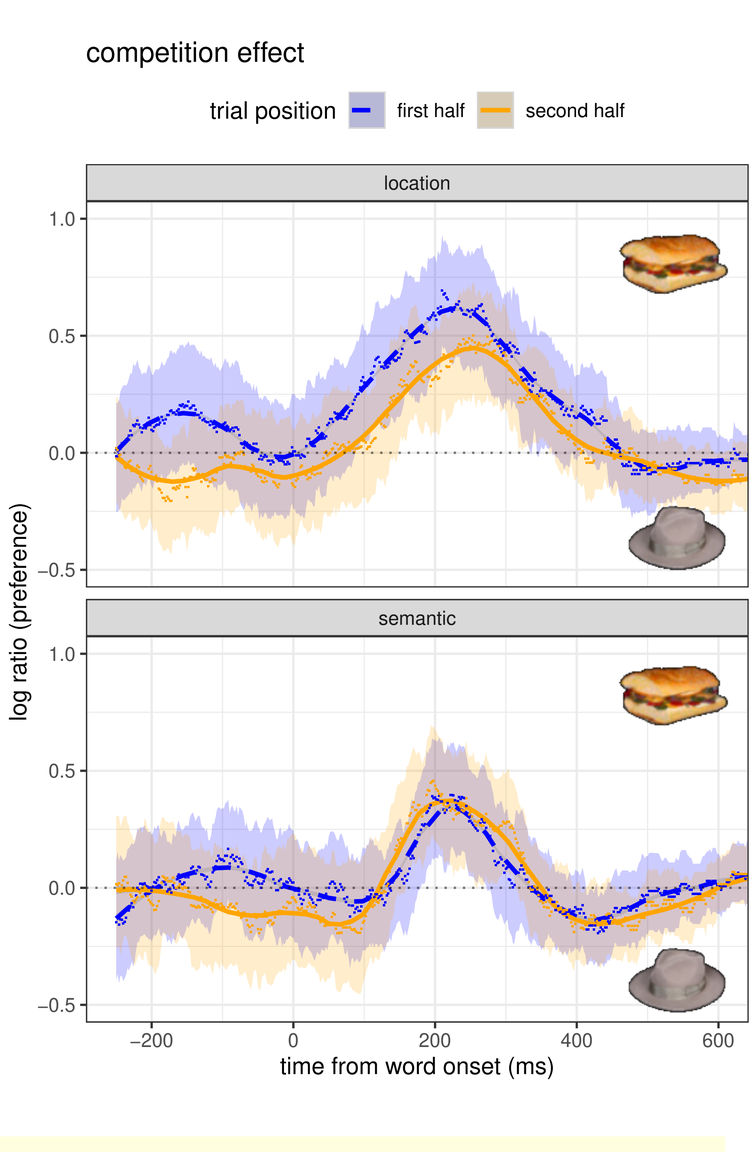
- target name preceded by semantically biased verb ("eat the sandwich [target]"; competitor = sandal)
- participants learn that verb semantics (eat) no longer predict targets
- 16 test trials with targets that meet verb selection restrictions but competitors that don't
- 32 fillers with verbs that don't make sense for targets
- prediction: as block progresses, decreased predictive effect of verb

What happens to lexical competition?

"...select the sandwich"

"...eat the sandwich"





To test predictions, log ratios were calculated for the first and second halves of each block, and separate comparisons were used to calculate anticipatory and lexical competition effects

- Participants learned to anticipate the location of the target
- However, there was no evidence for any corresponding reduction in lexical competition

Situational cues affect prediction but do not modulate lexical processing.

- Participants could not unlearn to attend to semantic cues
- There was also no evidence for any change in lexical competition

Semantic cues cannot be easily overriden by short-term situational cues.

References

Barr, D. J. (2008). Pragmatic expectations and linguistic evidence: Listeners anticipate but do not integrate common ground. *Cognition, 109*, 18-40.

Dahan, D., & Tanenhaus, M. K. (2004). Continuous mapping from sound to meaning in spoken-language comprehension: immediate effects of verb-based thematic constraints. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 30,* 498.

TAKE HOME:

Although verb semantics can constrain lexical competition (Dahan & Tanenhaus, 2004; Barr, 2008), we found no such evidence for situational constraint.

Semantic and pragmatic cues can both be the basis of referential prediction, but only long-term semantic knowledge can influence lexical processing.

Poster presented at XPRAG 2025
Cambridge, UK

University of Glasgow