Listener adaptation to prosodic cues to syntax

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INTRODUCTION

- The realization of prosody varies across speakers, accents, and speech conditions (e.g., Ladd, 2008). Listeners, in turn, must navigate this variability to converge on consistent prosodic interpretations. As such, it is possible that listeners adapt to new realizations of prosodic phenomena.

- Previous studies have shown evidence that listeners can adapt to new mappings between prosodic structure and pragmatics (Kurumada, Brown, & Tanenhaus, 2012).

- However, it is still an open question whether listeners can adapt to new mappings between prosodic structure and syntactic structure.

- Some accounts argue that this relationship is inherently probabilistic, and therefore potentially adaptive (Watson & Gibson, 2005).

- Other accounts argue that the relationship between prosody and syntax is highly entrenched and resistant to short-term changes in production and comprehension (e.g., Tooley, Konopka, & Watson, 2014; Jun & Bishop, 2015).

METHOD

Participants

- 78 Monolingual speakers of American English recruited from Amazon's Mechanical Turk.

Materials

- 48 recorded sentences (24 critical trials).
- Critical trials included sentences with relative clause attachment ambiguities that could be disambiguated only through the use of prosodic boundaries:

Conditions

- **Congruent prosody group:** feedback confirmed the interpretation that is typically signaled by an intonational phrase boundary in English.
- **Incongruent prosody group:** feedback was inconsistent with typical boundary use in English.
- **Order:** Trials were presented in randomized order, and we measured whether and how listeners' responses changed throughout the course of the experiment.

RESULTS
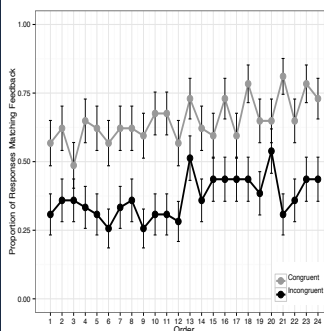
- Listeners in the congruent prosody condition were more likely to provide responses that matched the feedback they received (p<.001)

- Listeners' responses in both the congruent and incongruent conditions became better matched with the feedback over the course of the experiment (p<.001).

- However, English has a preference for low-attachment (e.g., Cuetos & Mitchell, 1988). It is possible that listeners' rates of adaptations vary depending on what structure they had to adapt to.

- Listeners do adapt to new prosody-syntax mappings, especially listeners who are more experienced with the prosodic structure they must adjust.

CONCLUSIONS

- These results constitute novel evidence that the mappings between prosody and syntax are probabilistic and adaptive in response to exposure.

- Our results suggest that listeners are capable of using feedback on outcomes of sentence comprehension (e.g., answers to comprehension questions) to assess the reliability of prosodic cues.

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Materials and Procedure

[LISTEN]

[early boundary (12 target trials)]

1.) a. The artist judged the painting | of the statue that was by the window.

[late boundary (12 target trials)]

b. The artist judged the painting of the statue | that was by the window.

[ANSWER] Comprehension question: *What was by the window?*

[   ]

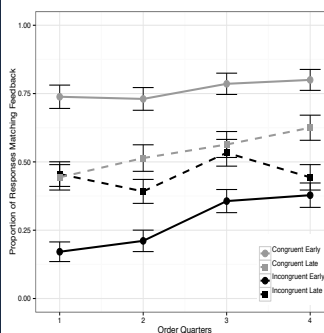| Congruent condition	Incongruent condition

[FEEDBACK]

Early boundary → low attachment (e.g., "the statue")	Early boundary → high attachment (e.g., "the painting")
Late boundary → high attachment (e.g., "the painting")	Late boundary → low attachment (e.g., "the statue")

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