

Accommodating variations in pragmatic interpretation of intonation contours

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INTRODUCTION

How do listeners use **prosody** to reliably interpret talkers' **belief states** [1], especially in light of socio-indexical [2] and within-talker **variability** [3]?

[Proposal] Listeners make inferences by using prior experiences to build a model about how the prosodic signal is mapped onto talkers' belief states.

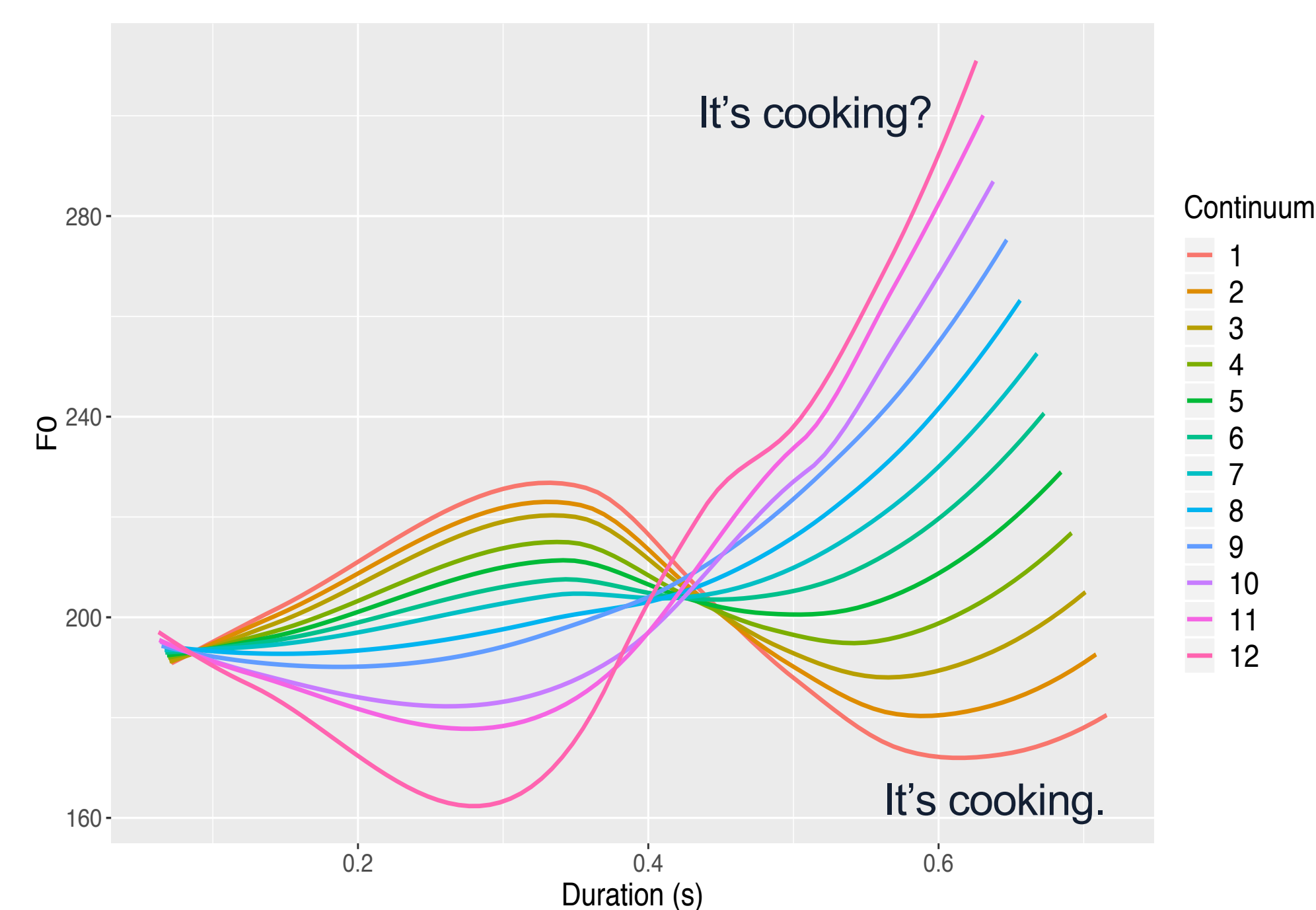
[Prediction] Listeners adapt to new mappings between the input and belief states.

Research question: Are listeners able to adapt their intonation interpretations based on changes in the input?



METHODS

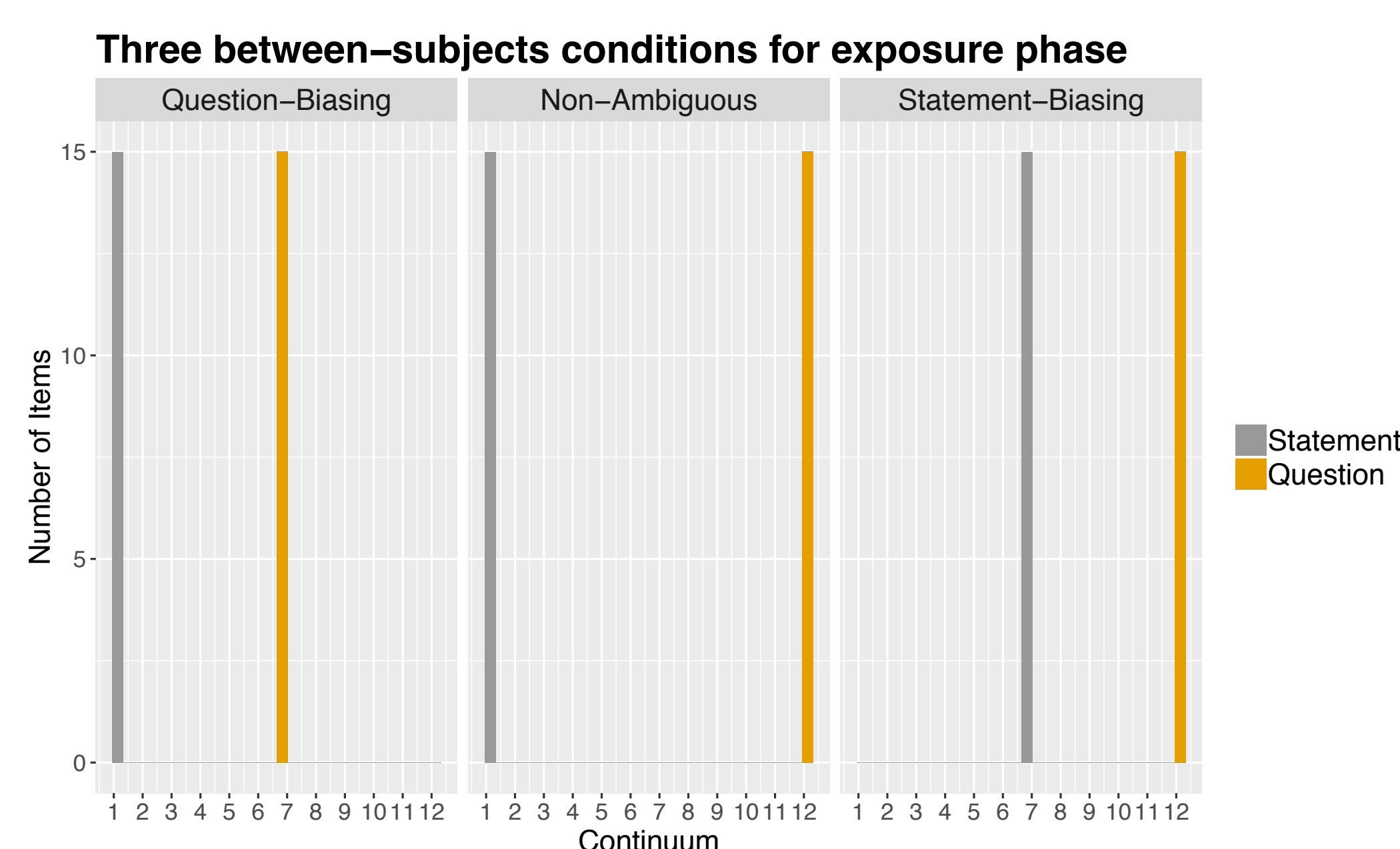
- 16 instances of [it's-X-ing] sentences were recorded
 - Once with a falling, declarative intonation
 - Once with a rising, question intonation, used as two end points of 12-step continua [4].
- Three-phase experiment
- Two-alternative forced-choice task (Question / Statement)
- 180 participants from Mechanical Turk



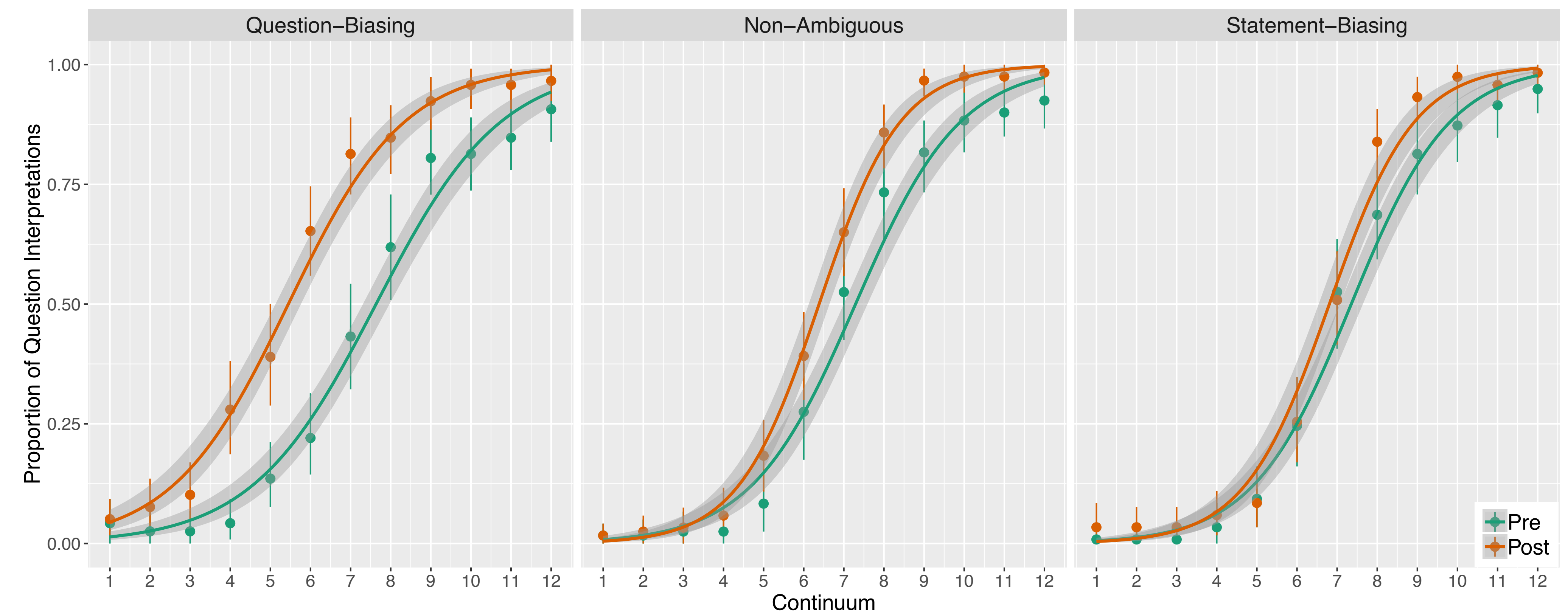
Pre-exposure
2 x 12 steps of one item
("It's cooking > It's cooking?")

Exposure
15 statements, 15 questions
Feedback about type

Post-exposure
Identical to pre-exposure



RESULTS



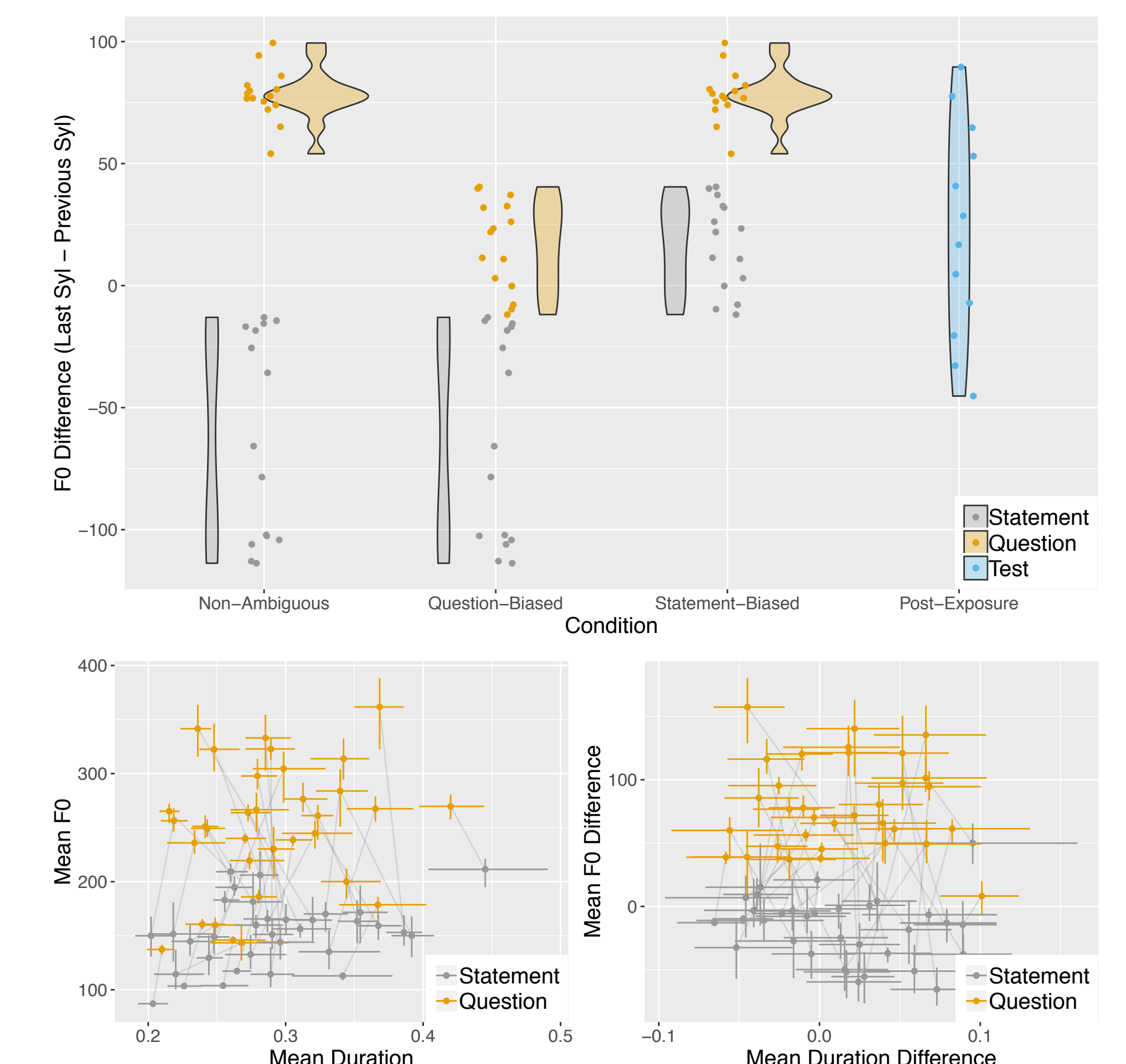
- Listeners shifted their category boundaries in response to the exposure they received throughout the experiment.
- The shift in the Non-Ambiguous condition could be due to the shift in $p(\text{question})$.
- There were asymmetries as to when listeners adapted most (Question-biasing vs. Statement-biasing, in particular).

CONCLUSIONS AND FOLLOW-UPS

- Listeners are sensitive to changes in how belief states are encoded prosodically and they adapt their interpretations of intonational contours accordingly.
- They may be shifting their expectations as well, as suggested in Non-Ambiguous condition.
- No shift in Statement-Biasing condition. Why?

Ongoing follow-up studies:

- 1) Manipulating F0 and duration independently.
- 2) Changing variance of a distribution (cf. the mean shifts in the current experiment).
- 3) Syntactically marked questions at exposure (e.g., Is it raining?)
→ Can listeners learn variations of intonational information as conditioned on various syntactic structures?
- 4) Modeling adaption in the ideal-adaptor framework [5].



REFERENCES

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- [2] Clopper, C. G., & Smiljanic, R. (2011). "Effects of gender and regional dialect on prosodic patterns in American English," *Journal of Phonetics*, 39(2), pp. 237-245.
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- [4] Kurumada, C., Brown, M., Bibyk, S., Pontillo, D., & Tanenhaus, M.K. (2014). Rapid adaptation in online pragmatic interpretation of contrastive prosody. *Proceedings of the 37th Annual Meeting of the Cognitive Science Society*.
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