

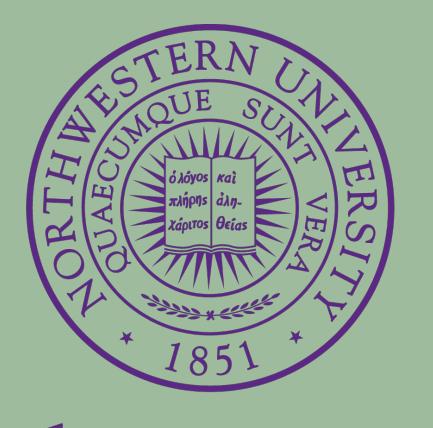


UNIVERSITY of
ROCHESTER

Listeners Maintain Uncertainty About Acoustic Input

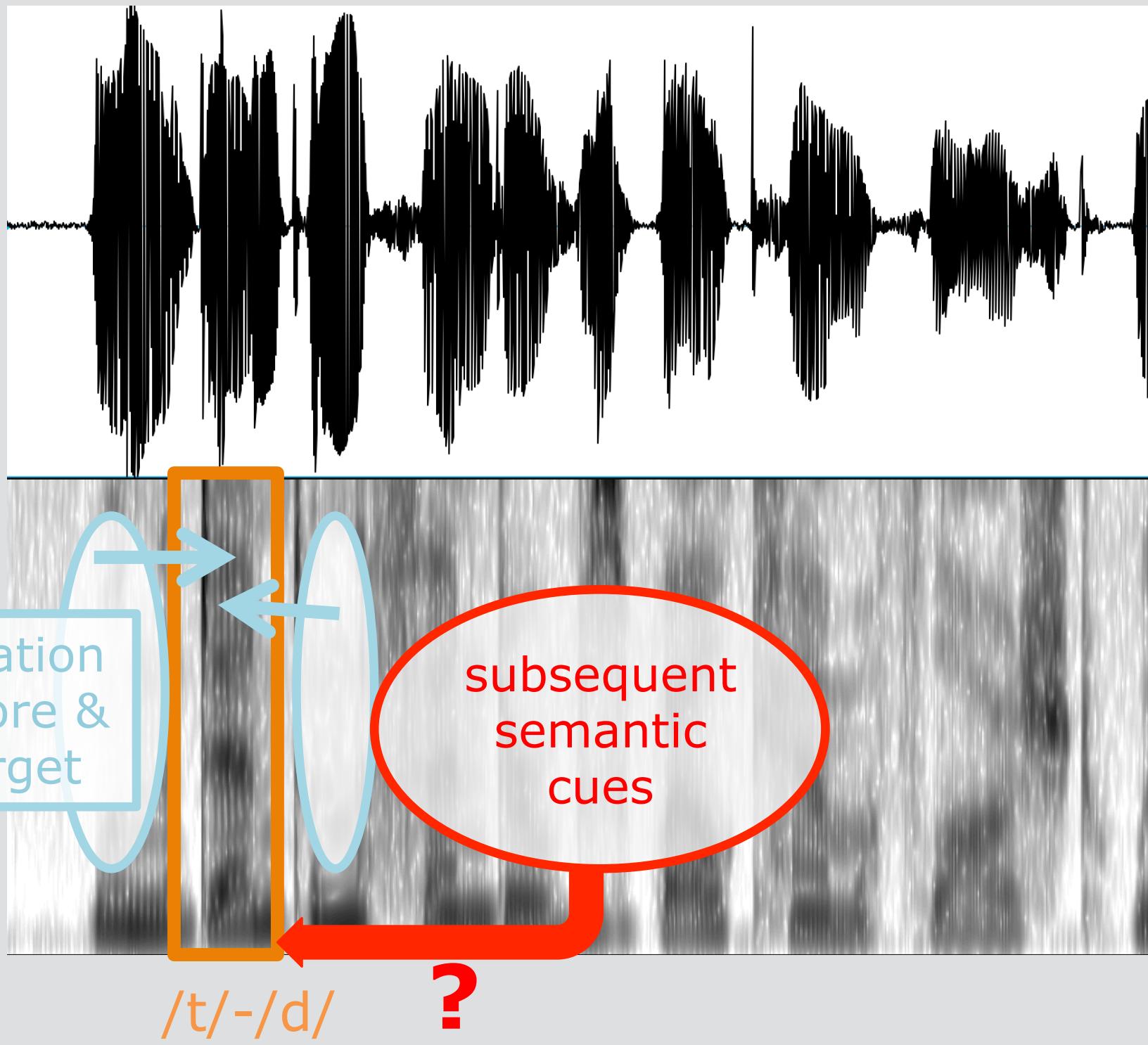
Wednesday Bushong¹, Klinton Bicknell², and T. Florian Jaeger¹

¹Department of Brain & Cognitive Sciences, University of Rochester ²Department of Linguistics, Northwestern University



Northwestern
University

Overview & Question



"When the ?ent in the fender was noticed..."

Q1: Can listeners maintain uncertainty/information about input for both ambiguous and unambiguous input? For how long?

Q2: Does ambiguity affect when listeners make a decision?

Methods

3 or 6-8 syllables

...the ?ent in the fender/forest...
dent-biasing/tent-biasing context
10ms /d/-like VOT 85ms /t/-like

Task: did you hear "tent" or "dent"?

Experiment 1: Subjects forced to respond after whole sentence has been played

Experiment 2: Subjects can respond whenever they want

Mechanical Turk subjects (Exp 1: N = 39; Exp 2: N = 37)

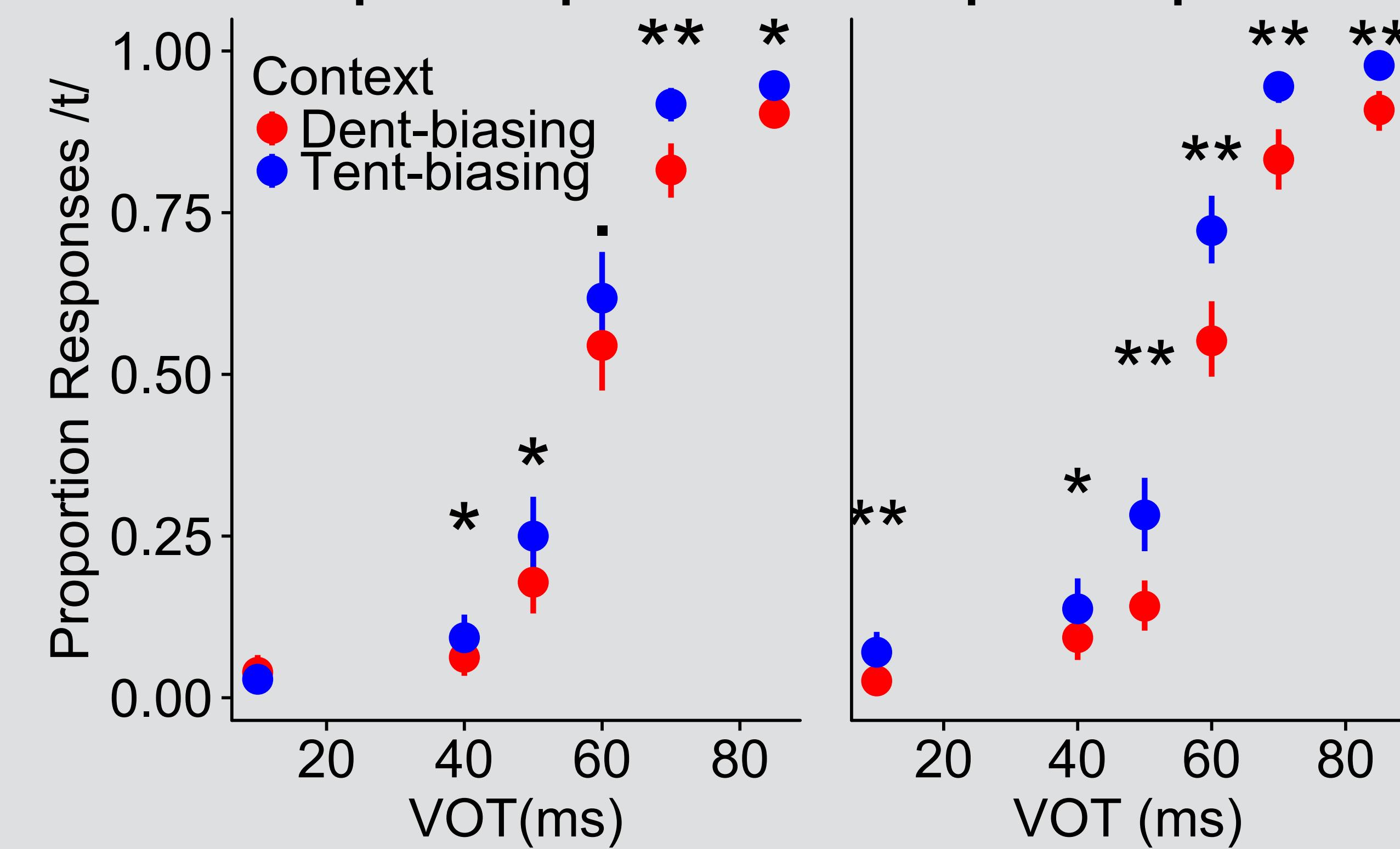
VOTs used: 10, 40, 50, 60, 85ms

7 sentence frames repeated for each context, distance, & VOT combination = 168 total trials (no fillers)

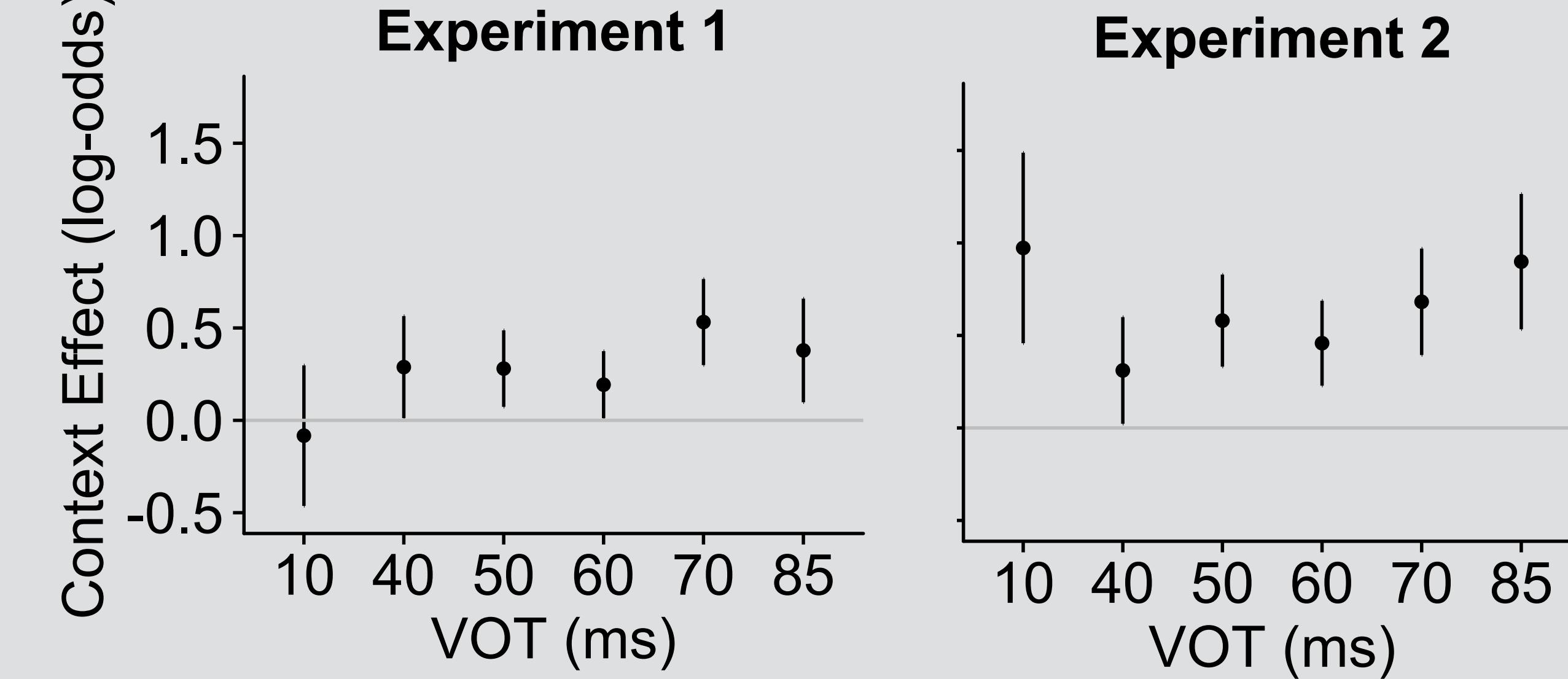
Q1: Uncertainty Maintenance for All Stimuli?

If listeners maintain information about the manipulated sound regardless of ambiguity & distance, they should integrate later context into their responses across all VOTs and context distances

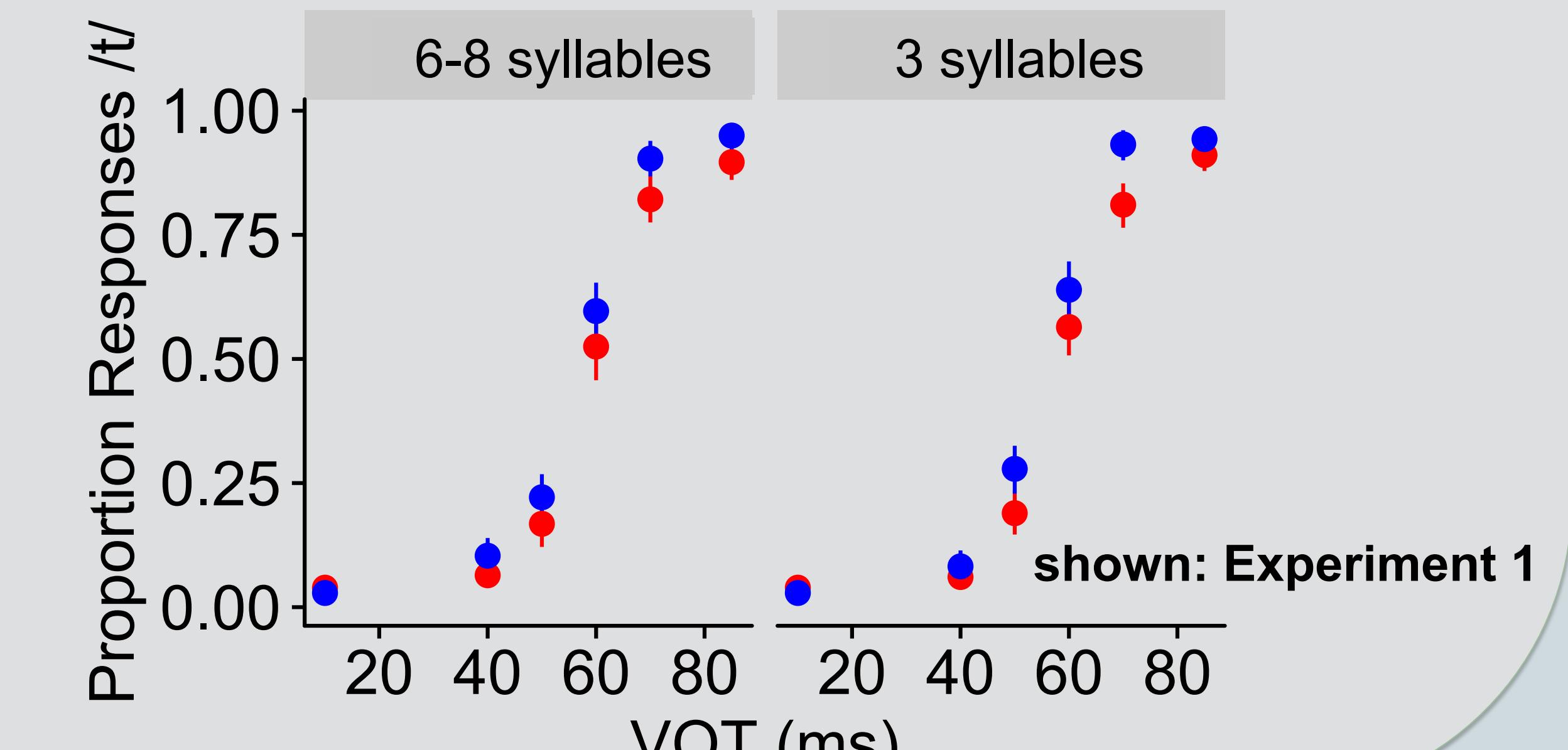
Listeners maintain uncertainty about input



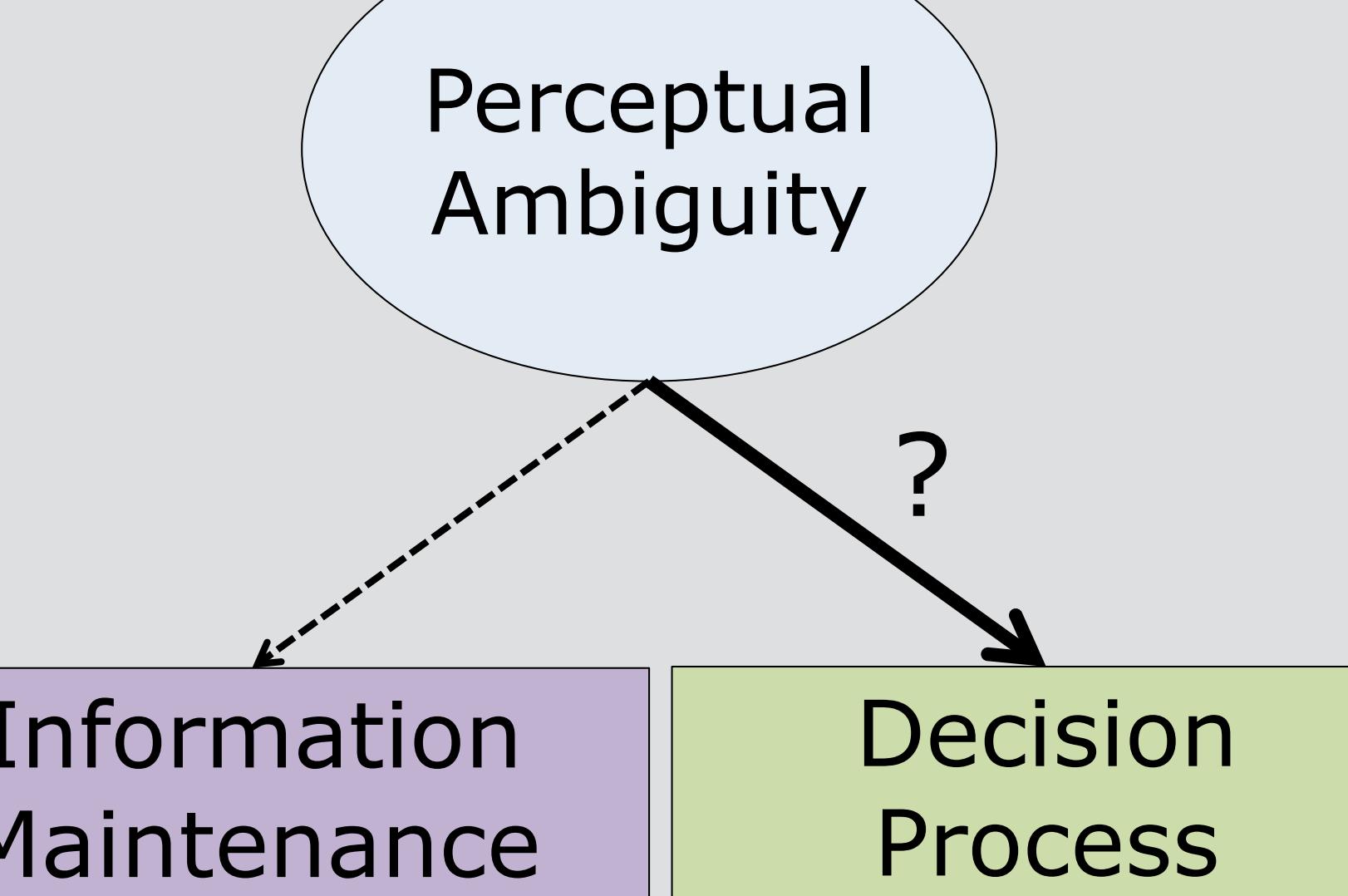
Maintenance not limited to ambiguous VOTs



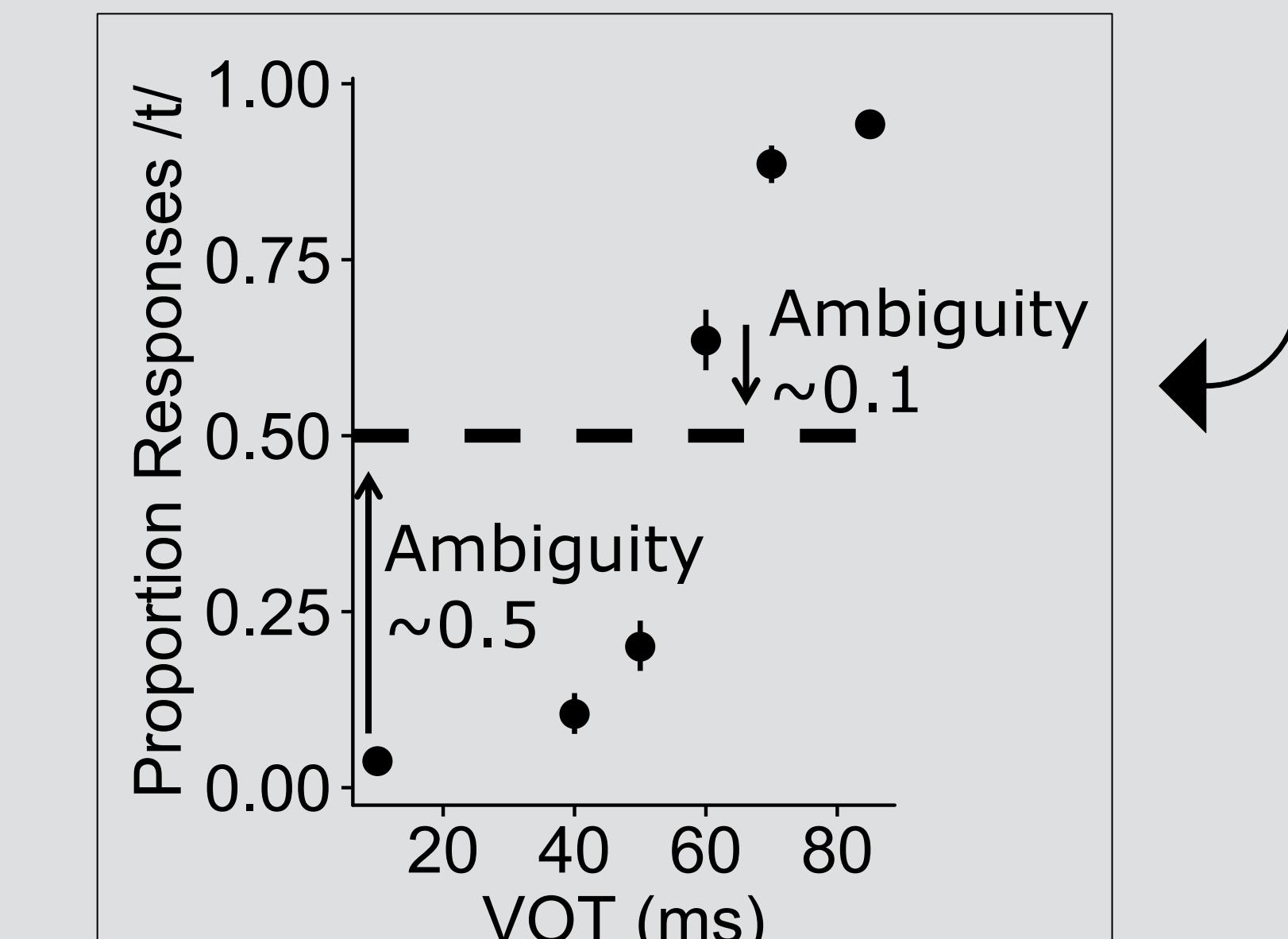
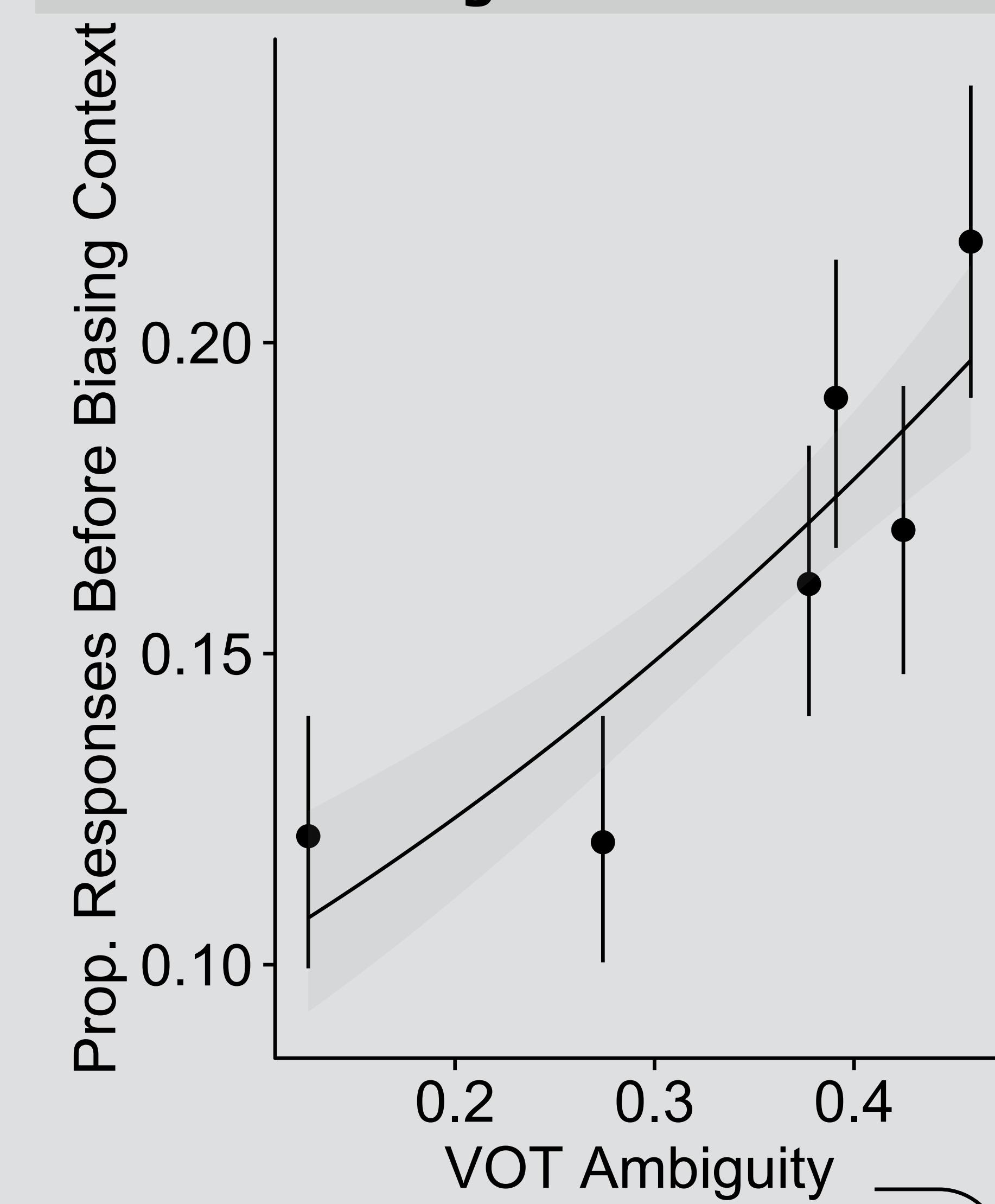
Maintenance equally strong for 3 & 6-8 syllables



Q2: Do Listeners Delay Decision Process For Ambiguous Stimuli?



More early responses for unambiguous stimuli



Conclusions

Listeners can maintain information about input **beyond word boundaries** (~8 syllables) and **for both ambiguous and unambiguous input**

However, for **ambiguous stimuli**, **listeners are more likely to wait** for additional information before making a decision

Future Work

Is information maintained after the decision process?

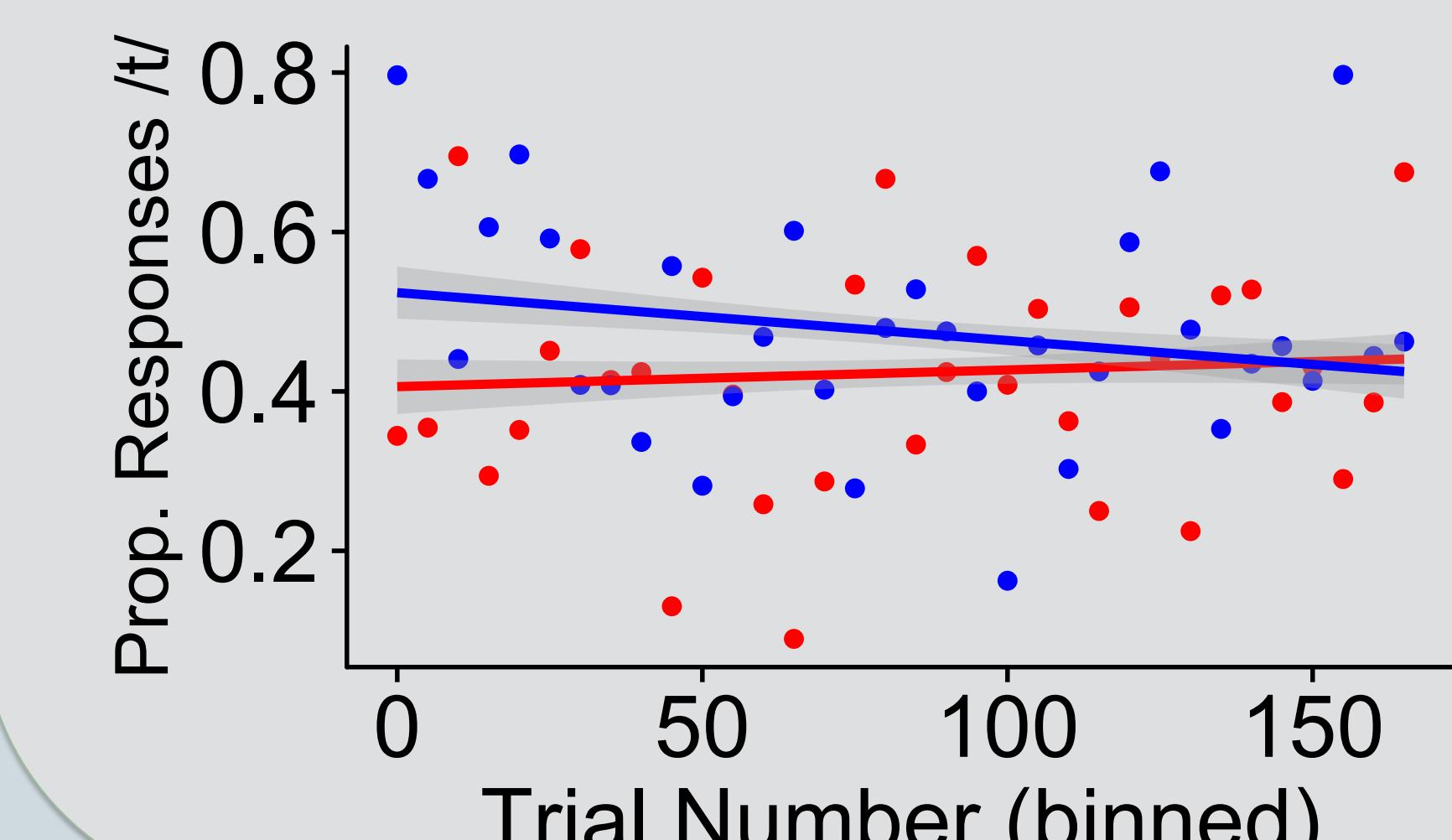
What is the *nature* of these maintained representations?

- Representations of probabilities?
- Maintenance of actual acoustic features?

Is information maintenance fixed or adaptable?

Is maintenance a default strategy?

- Yes? Context effect present even from very beginning of task in both experiments (below: for Exp 1)



Acknowledgments

This work was partially funded by NSF NRT #1449828 (W.B.) and NSF IIS-1150028 and NIHCD R01 HD075797 (to T.F.J.).