



How we comprehend foreign-accented speech: Learning to generalize across talkers

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Background:

- Exposure to **multiple talkers of a single accent** → generalization to **novel talker of the same accent**^{1,2,3}
- Exposure to **multiple talkers of multiple accents** → generalization to **novel talker of a familiar accent and novel accent**²
- Listeners learn systematic variation across talkers, but empirical evidence is limited

Question: What circumstances facilitate generalization of accent-adaptation?

Experimental Paradigm:

Task: Transcribe sentences in noise, conducted on Amazon Mechanical Turk

Stimuli: Example: “**Dad** pointed at the **grass**.”

Dependent Measure: Proportion of correctly transcribed keywords

Experimental Overview:

- Experiment 1: Circumstances that facilitate generalization
- Experiment 2: Exposure structure
- Experiment 3: Test items

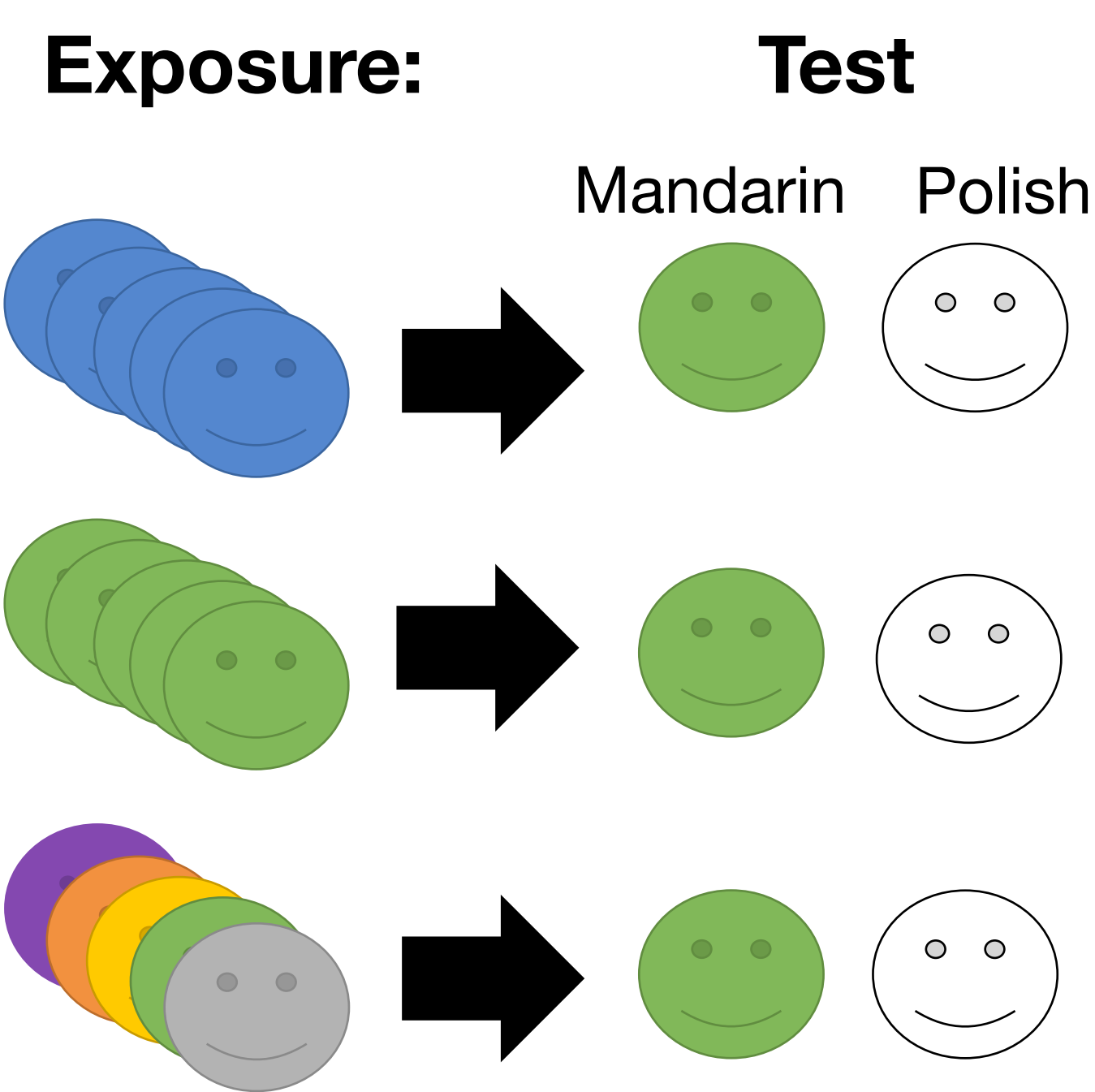
Experiment 1: What exposure conditions facilitate accent-independent, talker-independent generalization?

Conditions:

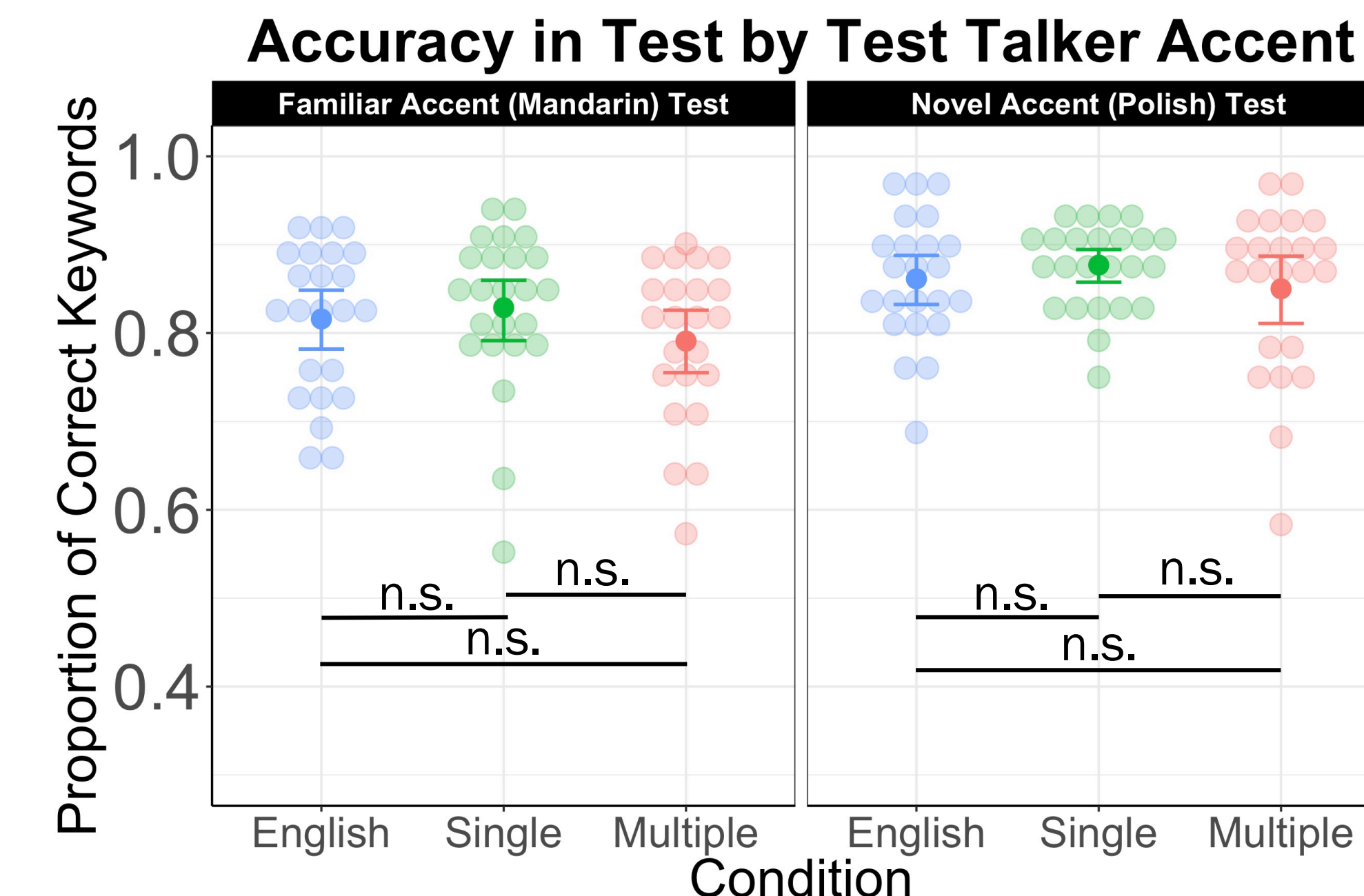
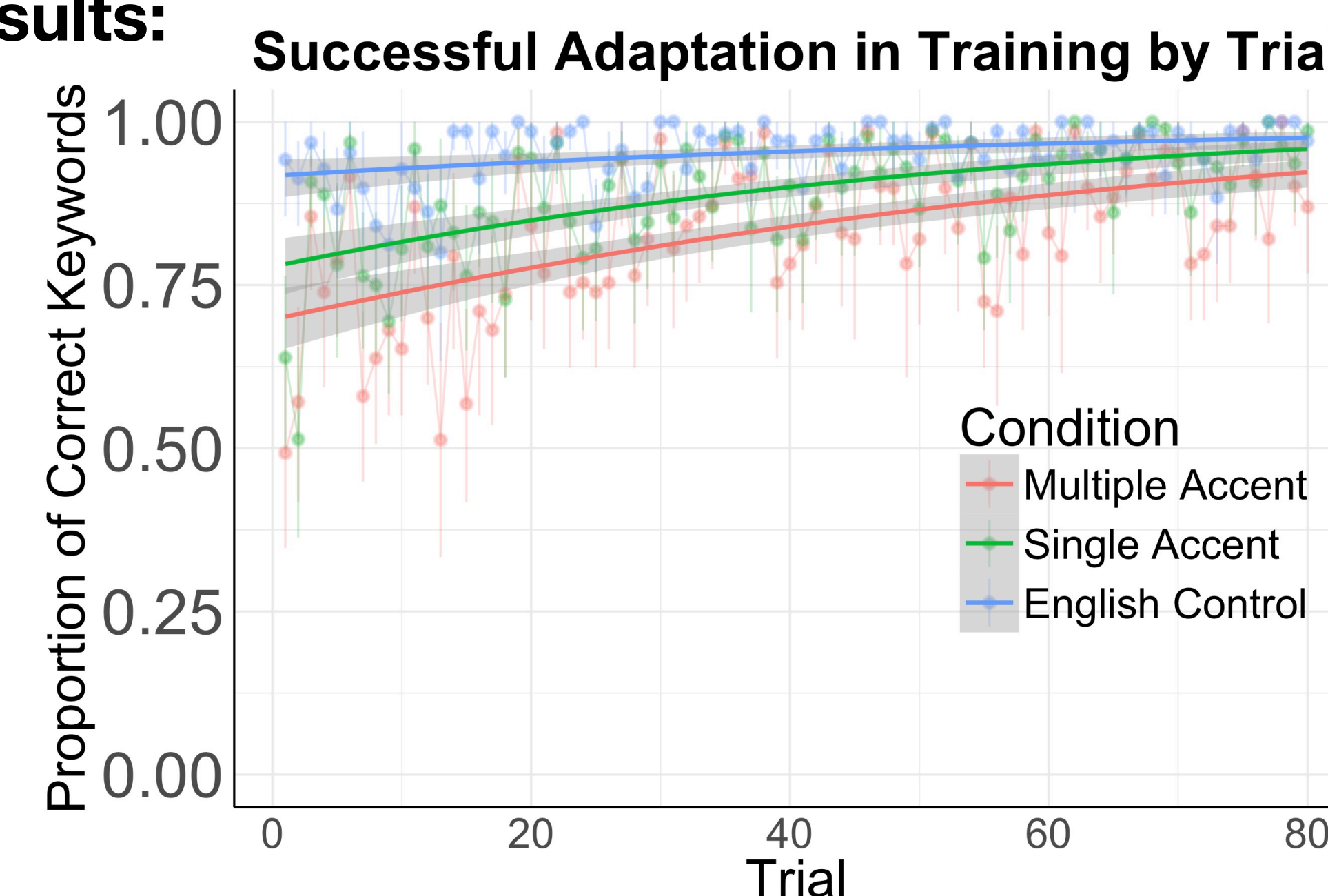
English: 5 different English speakers

Single (Accent): Mandarin-accented speakers

Multiple (Accent): 5 different accented speakers



Results:



- **Improvement across Exposure**
- **No significant difference between conditions on both Mandarin and Polish Test talkers**

Experiment 2: Does exposure structure affect generalization?^{3,4}

Conditions:

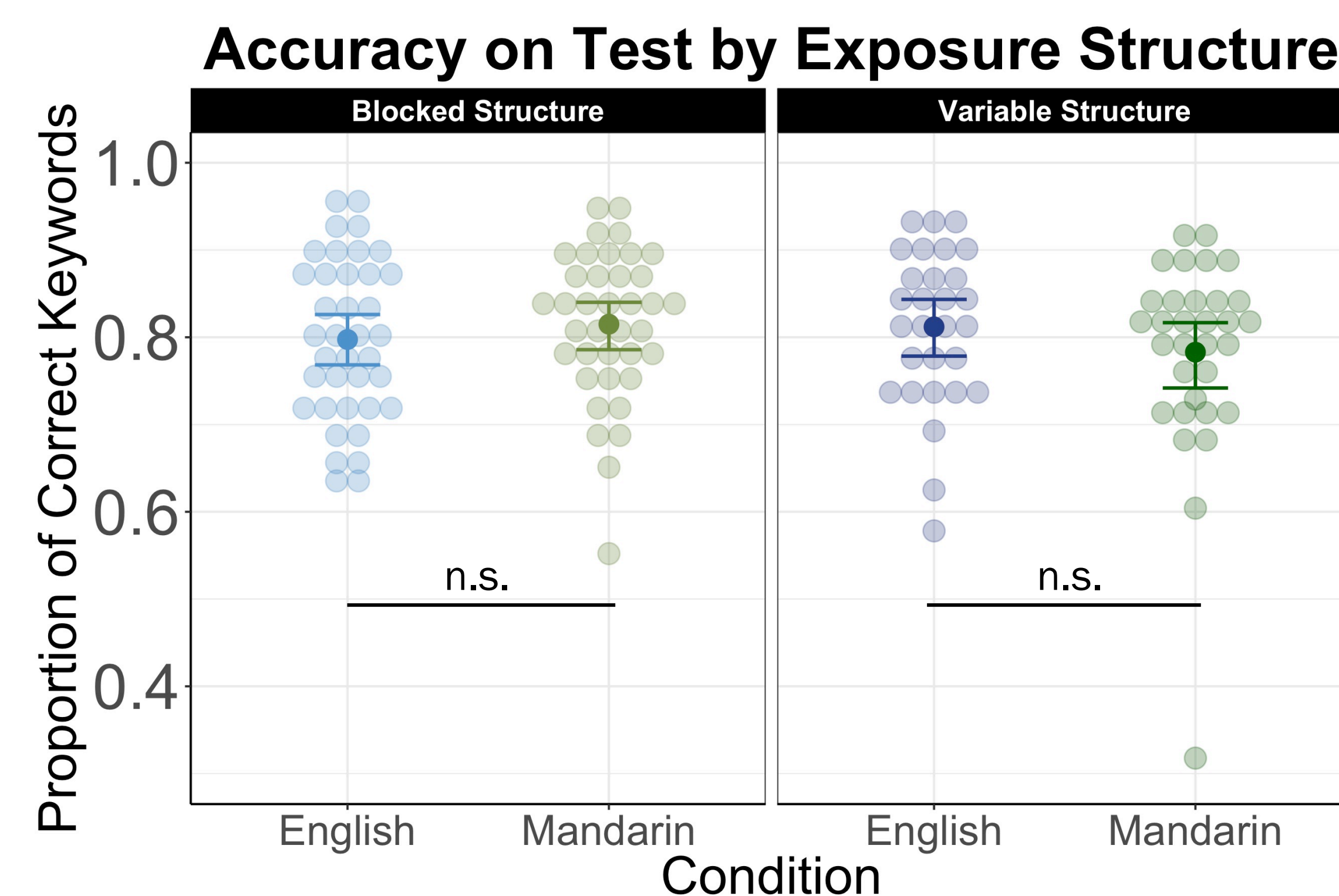
English: Blocked by speaker

Mandarin (Accent): Blocked by speaker

English: Variable structure

Mandarin (Accent): Variable structure

Results:



- **Exposure structure may not be a critical factor in inducing generalization**

Experiment 3: Does generalization depend on specific test items?³

Varied Test Items:

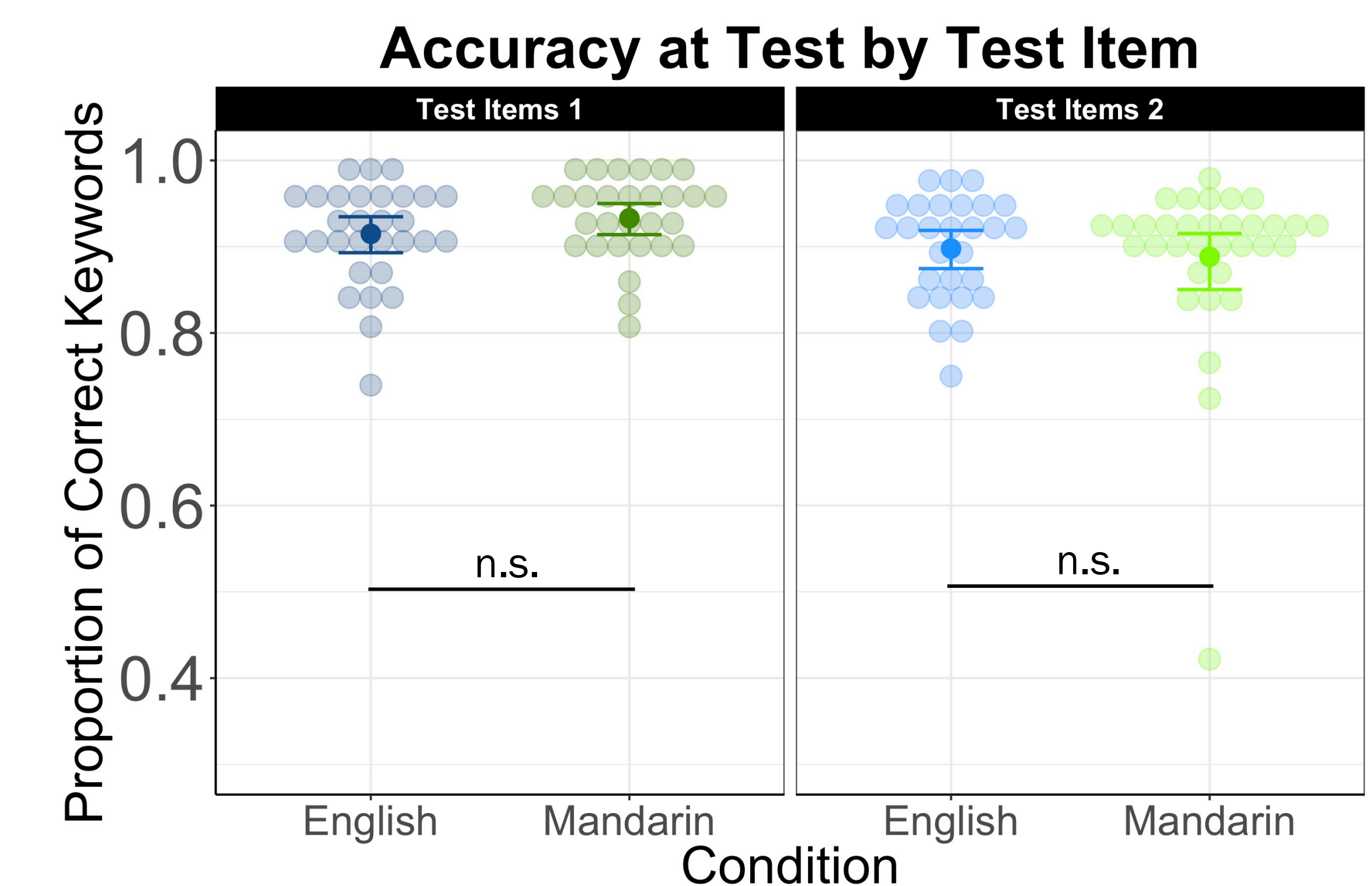
English: Test 1

Mandarin (Accent): Test 1

English: Test 2

Mandarin (Accent): Test 2

Results:



- **May not be as robust across test items as previously predicted**

Conclusions:

- **Multiple-talker exposure does not guarantee generalization**
- **Generalization may not be as robust as previously assumed**

Future Work:

- In-lab session vs. Mechanical Turk
- 1 day vs. 2 day exposure

Acknowledgements:

This work was supported by an NICHD R01 HD075797 to TFJ.

All views expressed are those of the authors and do not necessarily reflect those of the sponsors.

We are grateful to Ann Bradlow for providing access to the Wildcat corpus.

References:

- ¹ Bradlow & Bent, 2008.
- ² Baese-Berk et al., 2013.
- ³ Weatherholtz, Liu, & Jaeger, 2015.
- ⁴ Nygaard et al., 2015.