



# 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**<sup>1,2,3</sup>
- Exposure to **multiple talkers of multiple accents** → generalization to **novel talker of a familiar accent and novel accent**<sup>2</sup>
- 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

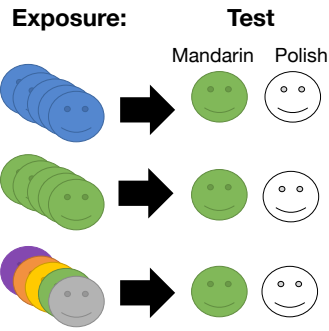
## Experiment 1: What exposure conditions facilitate accent-independent, talker-independent generalization?

### Conditions:

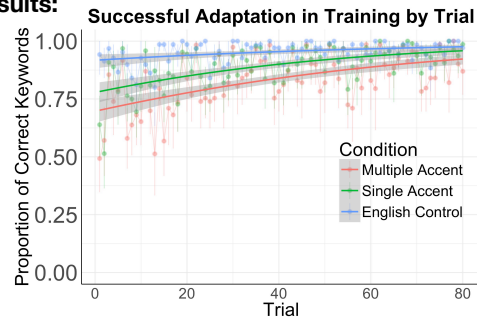
**English:** 5 different English speakers

**Single (Accent):** Mandarin-accented speakers

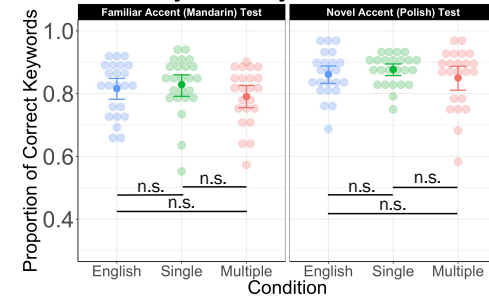
**Multiple (Accent):** 5 different accented speakers



### Results:



### Accuracy in Test by Test Talker Accent



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

## Experiment 2: Does exposure structure affect generalization?<sup>3,4</sup>

### Conditions:

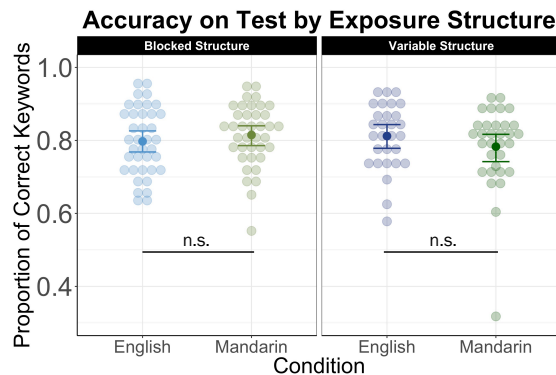
**English:** Blocked by speaker

**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?<sup>3</sup>

### Varied Test Items:

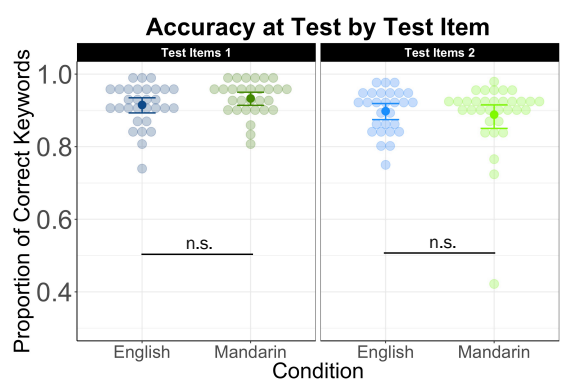
**English:** Test 1

**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

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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.