Do talker effects on auditory segregation vary with selection demands?

Introduction

Successful auditory attention requires both *segregating* streams and *selecting* one for further analysis

Voice differences between streams can facilitate segregation^{1,2,3,4}

Linguistically similar streams impose high demands on selection

Linguistically different streams can facilitate selection, as in natural listening



is super interesting

in New Orleans

Does the segregation benefit of voice differences depend on selection difficulty?

Methods

Task: What are the four target syllables?

Target voice is fixed; also manipulated temporal position of target (i.e., does target lead/lag relative to distractor?)



Stimuli spatialized to ±30° azimuth using generic head-related transfer function



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Participants

- Ages 18-60
- Native speakers of English
- No hearing impairment
- No neurological disorders

Exp. 1: Behavioral Results (N=20)

Exp. 1: Behavior (online) Target location (left/right), indicated by spatialized cue ("ba"), varies randomly across trials

Mean accuracy: 70% (Chance: 33%)

Significant Talker x Content interaction (p < 0.001) and Talker x Content x Target **Position** (lag/lead) interaction (p = 0.008)

Hearing the **same voice** in both streams only incurred an accuracy cost when selection was difficult and when targets lagged behind <u>distractors</u>

Syllable Position **Distractor talker** Different

Exp. 2: Preliminary Results (N=10)

Exp. 2: EEG experiment Data collection ongoing Target location (left/right) fixed for each participant

Mean accuracy: 80%

When selection is difficult, hearing the **same voice** in both streams leads to an accuracy cost

No interactions with the temporal positioning of target and distractor



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Voice differences only improve auditory attention performance when target selection is challenging

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