THE INFLUENCE OF LONG-TERM FAMILIARITY WITH NONNATIVE ACCENTS ON RAPID PERCEPTUAL ADAPTATION

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Introduction Speech communication often occurs in challenging listening conditions (e.g., speech-in-noise, accented speech). Although listeners can generally adjust to these adverse conditions -- for instance, even brief exposure to an initially unfamiliar nonnative accent can significantly improve speech recognition [1-4], their ability to do so vary considerably. Some studies suggest that individuals with more exposure to a particular accent [5] or to a diverse range of accents [6] may adapt better to a novel accented talker. This hypothesis has not yet been tested regarding longer-term experience beyond laboratory exposure. Under exposure - test paradigm, we asked how native English listeners from different regions of the US, which differ in the prevalence of Mandarin-accented English, adapt to an L2 Mandarin-accented talker. Results showed that rapid adaptation occurred, despite insignificant difference between two types of exposure environment.

Design Native English listeners (n = 33) were recruited through Prolific. Subjects were divided into **Accent-Familiar group** and **Accent-Unfamiliar group** by their current state of residency given drastically different percentages of Mandarin-speaking population (3.2% vs. 0.2%). A cross-modal priming task was used to measure speech recognition performance [3] [4]. During exposure, listeners responded if the final word of a heard sentence matched a printed word on the screen (Figure 1). In the final test block, they responded to sentences produced by a novel Mandarin-accented talker (test_accent}) and speech-in-noise from a novel native-accented talker (test_noise}) (Figure 2). Finally, in the baseline block, they responded to sentences produced by another native-accented talker. Reaction times (RTs) were adjusted by subject against that of the baseline block to normalize for individual differences in response latency.

Results Both groups demonstrated rapid adaptation during exposure, with RTs decreasing over the exposure blocks (Figure 2). However, we found insignificant difference between the **Accent-Familiar group** vs. **Accent-Unfamiliar group** in either test conditions (*ps* > .10). We currently do not have conclusive evidence that those who were expected to be more familiar with Mandarin-accented speech experienced less difficulty, at least when the talker switched between exposure and test blocks which involves some generalization of adaptation. As our sample size grows, we might see results suggesting that resilience to an adverse listening condition can, at least in part, be developed through long-term exposure and may be trainable, with important implications for future translational and clinical research.
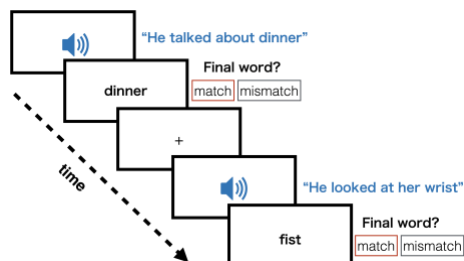

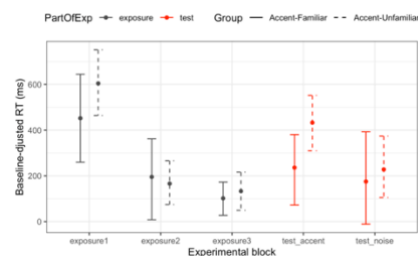Figure 1: Cross-modal word matching task implemented throughout the experiment.

Figure 2: Baseline-normalized RTs by experimental block and group during the exposure and test phases. Error bars represent 95% bootstrapped confidence intervals.

References: [1] Adank & Janse, 2010. Psychol Aging. [2] Bent & Baese-Berk, 2021. Wiley. [3] Clarke & Garrett, 2004. JASA. [4] Xie, Weatherholtz, Bainton, Rowe, Burchill, Liu & Jaeger, 2018. JASA. [5] Bradlow & Bent, 2008. Cognition. [6] Baese-Berk, Heffner, Dilley, Pitt, Morrill, & McAuley, 2014. Psychol Science.