Phoneme Learning in a Musical Context
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Introduction

- A sensitivity to distributional properties of phonetic tokens has been hypothesized to lead learners to induce the appropriate underlying phonemic categories [(1),(2)].
- In babies and adults, exposure to a continuum from [da] to [ta] with highest frequencies at the ends of the distribution (i.e., a bimodal distribution) leads to discrimination of [da] and [ta] tokens compared to exposure to a unimodal distribution with a peak at the center of the continuum.
- Separately, musical experience has been shown to influence linguistic abilities (the OPERA model, [3]).
- A lot of literature has been shown the effects of musical training on language learning [(4),(5),(6)].

Current Study

- The current study examines if distributional learning of phonemes can be enhanced by musical presentation of stimuli.
- English speakers were exposed to an eight-step continuum, with a unimodal or bimodal distribution.
- Additionally, half the participants were trained with a monotonous presentation of the tokens (Control), while the other half were exposed to the tokens in a melody (Music).

Auditory stimuli

- Audio stimuli: Hindi voiced and unvoiced labials /ba/ and /pa/.
- /b/ has negative VOT while /p/ has near-0ms VOT
- Recorded by a Hindi native female
- Additionally, used /ma/ as a filler sound

Results

- Fig 1. A continuum from [ba] to [pa] from T1 to T8 in a bimodal (left) and unimodal (right) distribution. Pre-voicing duration of T1 is 48ms and that of T8 is 0ms.

Proportion of correct trials (Control)

- No significant differences between bimodal and unimodal groups on ‘same’ and ‘different’ trial types.

Proportion of correct trials (Music)

- No significant differences between bimodal and unimodal groups on ‘same’ and ‘different’ trial types.

Conclusion and Discussion

- No statistical differences between control and music groups on ‘different’ trial type (not only overall but also block performance). Large bias to respond ‘same’
- However, we found numerically large differences between music’s bimodal and unimodal group on ‘different’ trials but not in control.
- Current data does not show any effect of musical stimuli on phoneme learning although the music group shows a pattern more compatible with phoneme learning than the control group.

References