Introduction

The current study investigated the influence of phonemic tone training on Cantonese tone word learning. Native English listeners completed a brief Cantonese tone training program before learning the meanings of 15 vocabulary items distinguished by Cantonese tones. Their performance in tone word learning was compared against groups of native Thai and English listeners who received no tone training prior to tone word learning. English tone-listeners and Thai participants attained similar levels of word identification proficiency by the end of training, both significantly better than the non-tone trained English listeners. The results suggest that pitch attunement can be advantageous when learning tone words.

Previous research

- Linguistic experience has been found to mediate the perception of non-native contrasts, with the interaction of L1 and newly-forming phonetic categories shaping perception (e.g. [1]).
- Domain-general attunement to pitch information (e.g. native tone language experience, musical training) shown to be advantageous in acquiring lexical items distinguished by non-native tone contrasts [2, 3].
- Research has yet to examine the effect of short-term pitch exposure on tone word learning, or how it compares to the performance of tone language listeners.

The current study

- Compares the effect of short-term laboratory tone training with non-tone language (English) listeners against the performance of tone language listeners on a Cantonese word learning task.
- Aims to examine the relative influence of short-term and long-term pitch experience on the ability to utilize non-native tones in a linguistic lexical context.

Experiment Overview

- Tone identification (Tone ID): test before and after tone training.
- Tone training (Tone Train): trained to identify Cantonese tones.
- Tone word training (Word Train): learned the meanings of words minimally distinguished by Cantonese tones.
- Word identification (Word ID Test): session test after Tone word training sessions 1 and 7.

Methods

Participants

- Tone & Word Training group (TT): 16 Canadian English listeners (4 male, 12 female; M. age=22)
- Control: 16 English listeners (4 male, 12 female; M. age=20)

Word-Only Training group (WO-E, WO-E):

- 18 Standard Thai listeners (10 male, 8 female; M. age=22)
- 16 English listeners (6 male, 10 female; M. age=24)

Tone ID Test Stimuli

- produced by 2 native Cantonese speakers (1 male, 1 female)
- 5 Cantonese CV monosyllables produced with 5 Cantonese tones: high level (55), high rising (26), low falling (21), low rising (23), low level (22)

Sensitivity

- OFAE: 0.58
- Average: 0.60

Tone ID Test: mean percent correct

- OFAE: 0.60
- Average: 0.58

Tone Training Stimuli

- produced by 4 native Cantonese speakers (2 males, 2 females)
- 5 Cantonese CV monosyllables with 5 tones (15 words x 5 tones)

Word-Only Training

- 50 words (15 words x 5 tones)
- Word identification

Procedure

Day 1

- Tone ID Test
- Tone Training
- Word-Only Training

Day 2

- Tone ID Test
- Tone Training
- Word-Only Training

Day 3

- Tone ID Test
- Word-Only Training

Day 4

- Word ID Test
- Word Training

Day 5

- Word ID Test
- Word Training

Day 6

- Word ID Test

Day 7

- Word ID Test

Day 8

- Word ID Test

Results & Discussion

- No significant difference between groups with or without tone training
- Significant improvement in tone identification accuracy after word training
- Tone training was beneficial for comparable levels of success as tone language listeners, as an initial learning stage
- Tone training may have added useful patterns or pitch experience facilitated more stable tone representations allowing faster pitch-to-speech mapping
- Tone ID training may be used to help with learning, as similar tone training has been shown to be effective

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Conclusions

The current findings suggest that even short-term tone training can substantially impact tone word learning and allow for the attainment of comparable levels of success as tone language listeners, at an initial learning stage. Additionally, higher tone identification accuracy before tone training was beneficial for the non-tone language listeners; the tone language listeners, who had the lowest tone identification scores, achieved similar levels of word identification success. This suggests that they utilized their experience with using pitch lexically to facilitate acquisition.

The present research provides insight into the influencing factors on tone word acquisition, as both short and long-term pitch experience appear to play a role.