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Analysis of the Effects on Pronunciation of Training by Using Song or Native Speech

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What we did

- This research is an investigation of whether Japanese speakers' English pronunciation improves more after training on sung or spoken speech.
- We made pre- and post-training recordings of 30 Japanese learners of English who trained on sung or spoken speech. Then, 108 native or near-native listeners evaluated those audio samples.

Introduction

- Intelligibility of sung passages has been found to be seven times less than spoken counterparts. [1]
- Sung lyrics are often unintelligible for listeners because listeners have significant difficulty in discriminating different sung vowels. [2]
- Music changes pitch and rhythmic patterns of phrase. It makes understanding more difficult for the listeners. [3]
- Recently, many Japanese junior high schools use English songs as a resource for learning English pronunciation. To investigate whether practicing English music affects English pronunciation or not might be helpful for future planning of Japanese English education.

Method

Participants:

30 Japanese participants from University of Aizu

Experiment group (15): Use **sung** speech

Control group (15): Use **spoken** speech

12 native or near-native English listeners from Rose-Hulman Institute of Technology

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96 native English listeners from Amazon Mechanical Turk

Stimuli:

- Used song lyrics: Meet me under shining lights, I've been waiting right here all my life (From *Alive* by Krewella)
- Judgement Criteria:
  1. Phrase pronunciation:
     (i) lights (ii)I've been (iii) right here (iv) all my life
  2. Foreign accent
  3. Intonation

Data Collection & Analysis:

- We used R to analyze 108 data samples

Results

- Training by using sung speech resulted in generally worse listener judgements than training by regular speech. Results for each of the criteria can be seen to the right in Figs. 1~6.
- The two criteria, "right here" (Fig.3) and intonation (Fig.6) had significant interactions relative to the default "all my life".
- The criteria "***right here***" (Fig.3) shows that the phrase "right here" got negatively affected by training on sung speech. The number of "Bad" ratings decreased after spoken training, but increased after music training.
- The criteria ***intonation*** (Fig.6) shows, perhaps surprisingly, that the intonation of the whole sentence was negatively affected by training on sung speech.

Native Listener Judgements for each criterion pre- and post-training by speech ("Spoken") or song ("Music")

Frequency = the number of selections for that evaluation

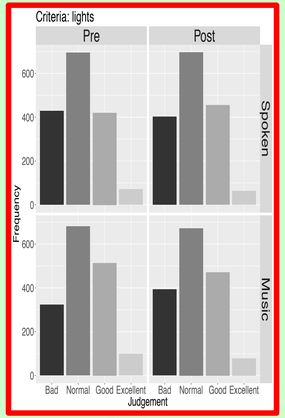

Fig. 1

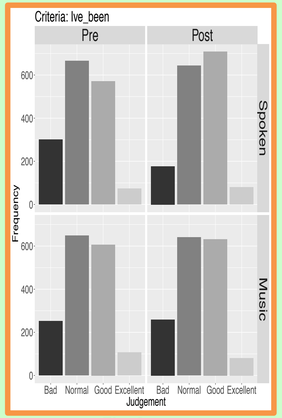

Fig. 2

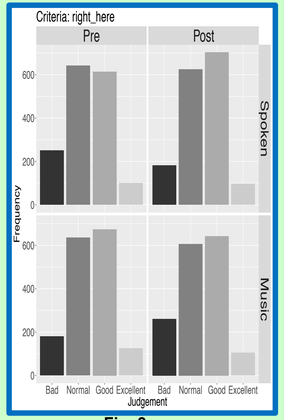

Fig. 3

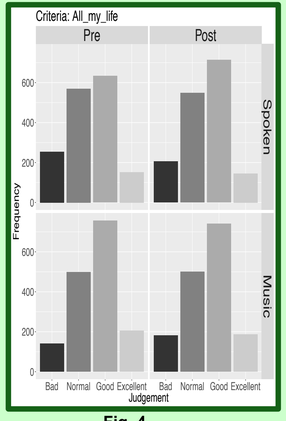

Fig. 4

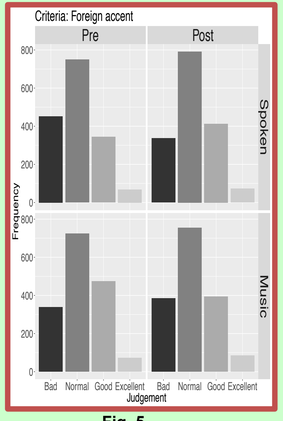

Fig. 5

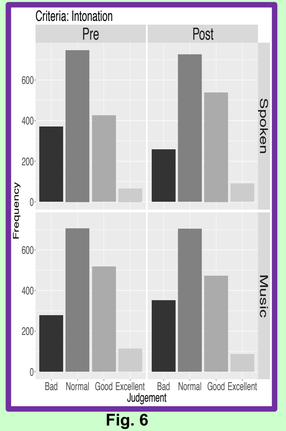

Fig. 6

Discussion and Future Work

- The main effect was discovered where stimuli from the post-training condition received higher judgement scores than those pre-training condition ($\alpha = 0.177$, $z = 2.43$, $p < 0.05$).
- The main effect where the musical training condition yielded overall higher scores (independent of pre- or post-training) was also seen ($\alpha = 0.600$, $z = 2.89$, $p < 0.01$). This may suggest that Experiment group (used sung speech) had higher Judgment ratings prior to any training effect.
- Training with the music stimuli had a negative effect on ratings in the post-training condition ($\alpha = -0.349$, $z = -3.39$, $p < 0.01$). It shows training by using regular speech is more effective for English learners than training by using songs.
- Our results suggest that if Japanese learners of English want to improve their English pronunciation, it is reasonable for learners to use spoken speech rather than sung speech.
- Due to the relatively short stimulus phrase, in the future we would like to collect more data to get more varied, generalizable results.

References

[1] Lauren B. Collister and David Huron (2008). Comparison of Word Intelligibility in Spoken and Sung Phrases. *Empirical Musicology Review*, 3(3): 109-125.

[2] Smith, L.A. & Scott, B.L. (1980). *Increasing the intelligibility of sung vowels. Journal of the Acoustical Society of America,* 67(5): 1795-1797.

[3] Edward Wickham (2013). From Speech to Song: A Response to Johnson, Huron and Collister on the Interaction of Music and Lyrics. *Empirical Musicology Review*, 9(1): 25-28.

Acknowledgments

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