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

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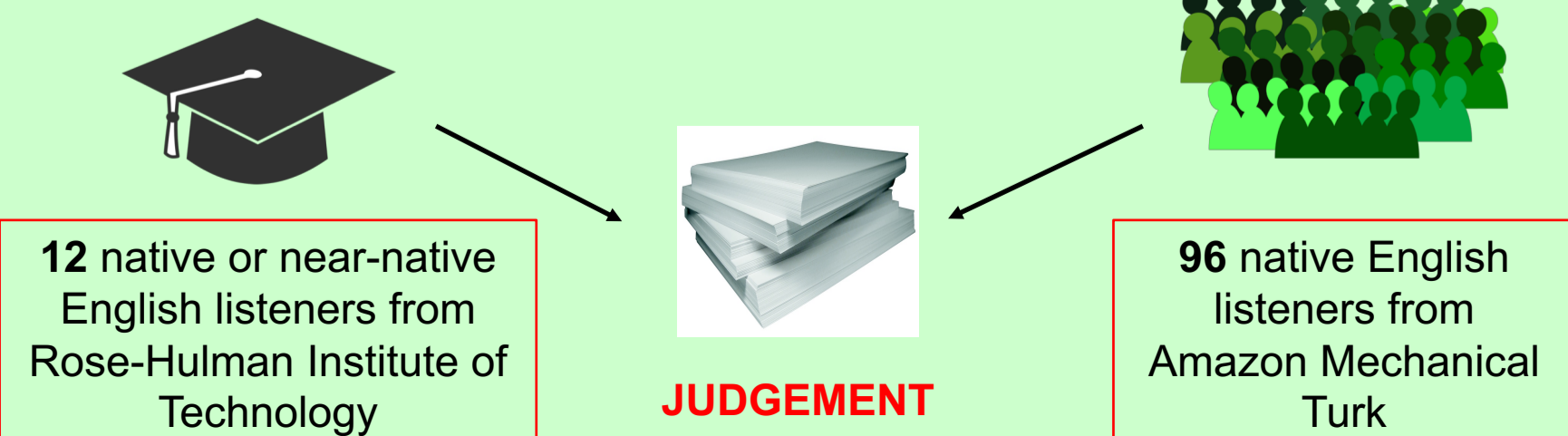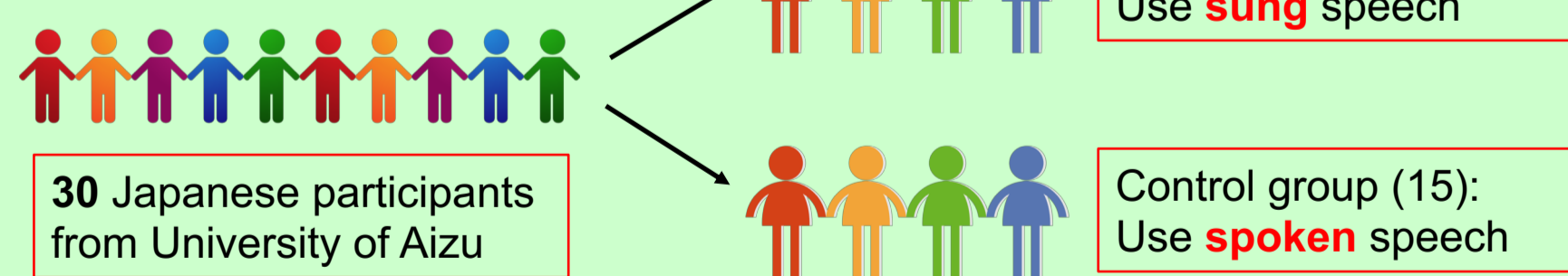### University of Aizu

What we did

- This research is an investigation of whether Japanese speakers' English pronunciation improves more after training with sung or spoken speech.

- We recorded 30 Japanese learners of English who trained on sung speech or spoken speech. Then, we got 108 native or near-native listeners evaluate those data samples.

Introduction

- Intelligibility of sung passages is 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.
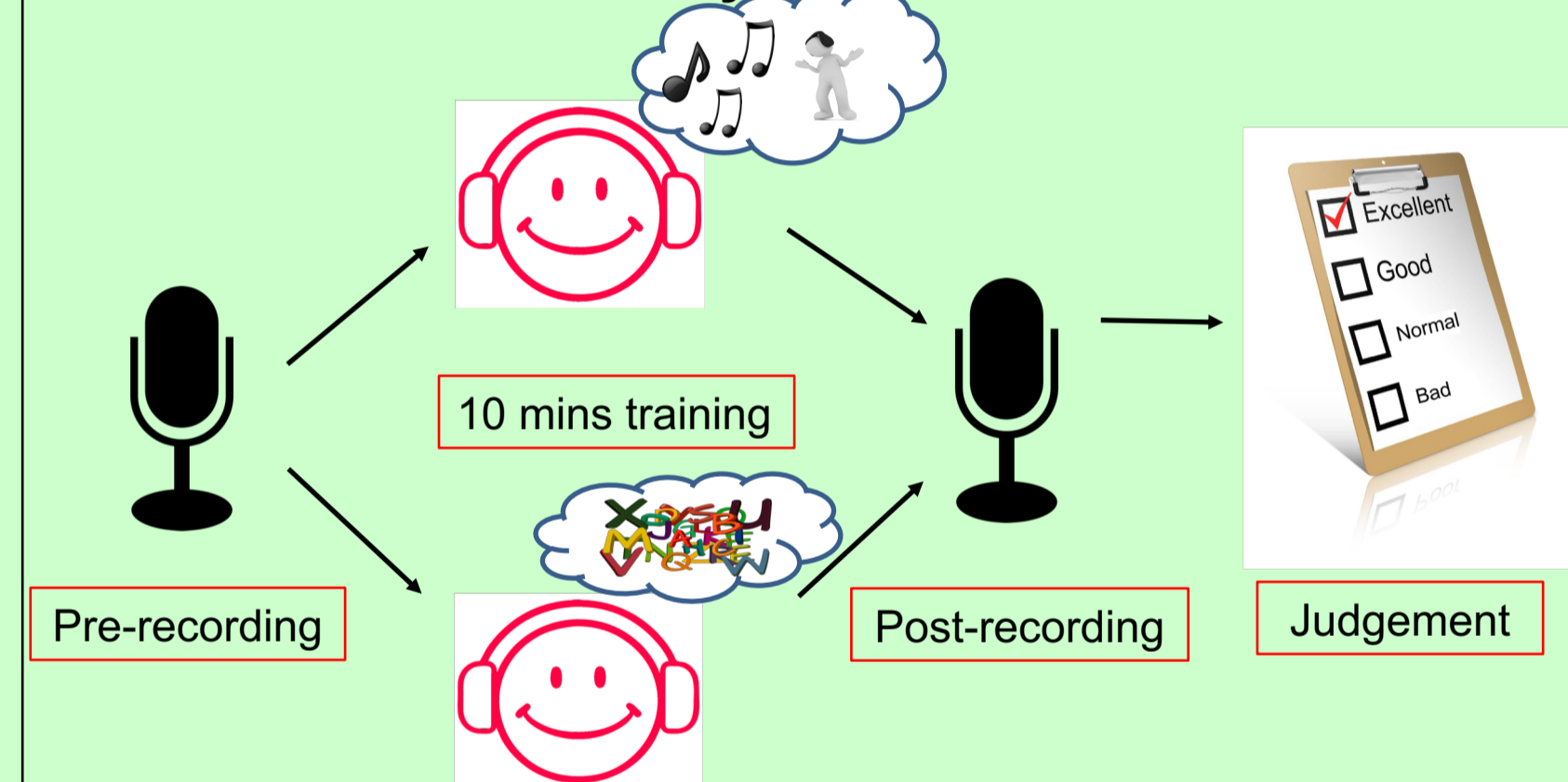
Method

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

96 native English listeners from Amazon Mechanical Turk

JUDGEMENT

Stimuli:

- Used song lyrics: Meet me under the shining light, I've been waiting right here all my life (From Alive by Krewella)

- Judgement Criteria:
  1. Phrase pronunciation:
     (i) light (ii) I've been (iii) right here (iv) all my life
  2. Foreign accent
  3. Intonation

Data Collection & Analysis:

Pre-recording

10 mins training

Post-recording

Judgement

Excellent
Good
Normal
Bad

- We used R to analyze 108 data samples

Results

- Training by using sung speech resulted in generally worse 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
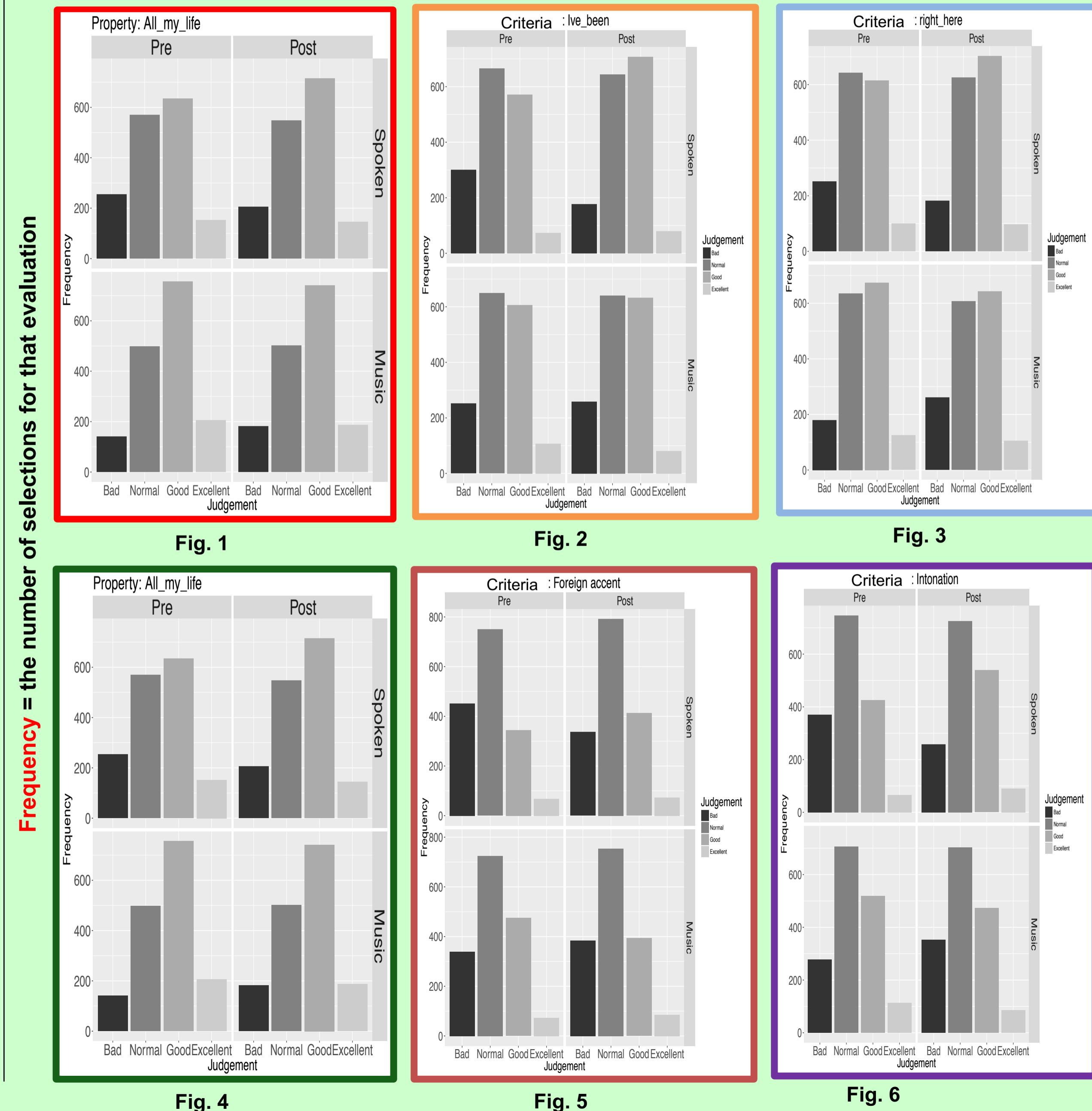
Discussion and Future Work

- 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 English learners 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