

Does high talker variability improve the learning of non-native phoneme contrasts? A replication

Gwen Brekelmans, Nadine Lavan, Meghan Clayards, Elizabeth Wonnacott

Background

- Acquiring non-native speech contrasts can be difficult when learning a new language.
- This can be improved through phonetic training.
- Two seminal studies report high-variability phonetic training (HVPT) beneficial over low-variability training.
 - Japanese learners of English /r/-/l/
 - HV and LV training in separate studies
- **Key finding:** Including *multiple talkers* during phonetic training is suggested to be advantageous over training including a *single talker*.
- As a result, HVPT is now a standard methodology. However, effect is less established than often thought.

Research question

Is high variability (HV) over low variability (LV) input in phonetic training beneficial for the amount of improvement in generalisation?

Key hypotheses

1. Greater improvement for HV than LV when tested on generalisation to novel talkers and novel items.
2. Higher performance for LV when tested on trained talkers than on untrained talkers. No or weaker difference for HV.

Participants

- 160 Japanese learners of English (maximal sample based on Bayesian sample estimation)
- Groups matched for pre-test performance across the high- and low-variability conditions

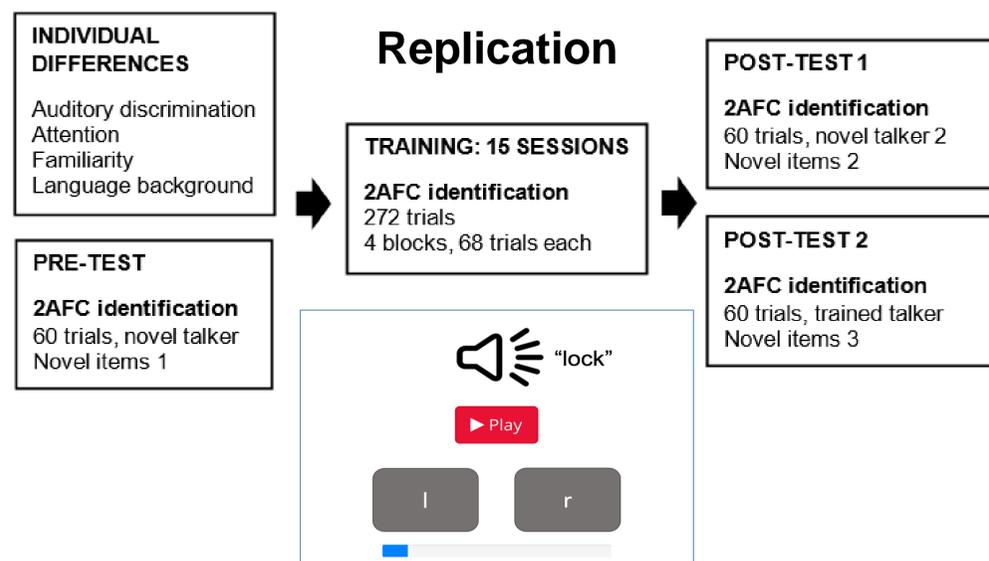
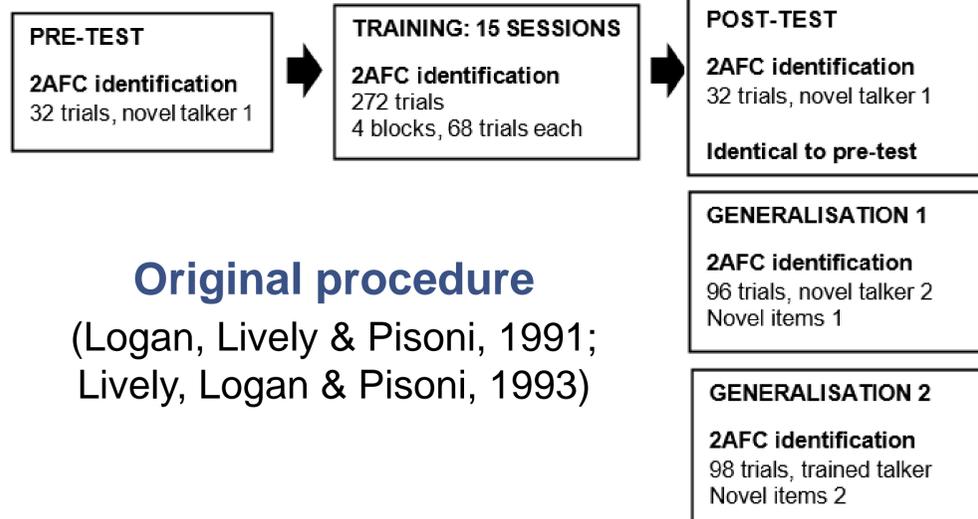
Stimuli

- Minimal pairs contrasting /l/-/r/ (e.g. rock vs lock)
- Mostly original items
- 5 talkers in HV training
- 1 talker in LV training

References

Lively, S. E., Logan, J. S., & Pisoni, D. B. (1993). Training Japanese listeners to identify English /r/ and /l/. II: The role of phonetic environment and talker variability in learning new perceptual categories. *The Journal of the Acoustical Society of America*, 94(3 Pt 1), 1242–1255.

Logan, J. S., Lively, S. E., & Pisoni, D. B. (1991). Training Japanese listeners to identify English /r/ and /l/: A first report. *The Journal of the Acoustical Society of America*, 89(2), 874–886.



Reasons to replicate

- Small original sample (N = 6 for each of the experiments).
- Statistical analysis cannot address the research question.
- Few conceptual replications of the high vs low variability training contrast, with mixed results.

Design

- 15 sessions of HV or LV training
- Pre/post-test design
- All tests measure generalisation of learning: novel talker and/or novel items

Analyses

- Mixed effects models
- Bayes Factors for H0 and H1 evidence
- Exploratory individual differences (e.g. attention)