



Perceptual Learning of Abstract Musical Patterns: Recognizing Composer Style

Carolyn A. Bufford¹, Khanh-Phuong Thai¹, Joselyn Ho¹, Cindy Xiong¹, Carly A. Hines¹, & Philip J. Kellman¹

¹ Psychology Department, University of California, Los Angeles, United States

Background

Perceptual Learning refers to improvements in the ability to pick up abstract patterns with experience (Gibson, 1969).

Recent research suggests that perceptual learning can be systematically produced in vision via perceptual and adaptive learning module (PALM) technology involving brief classification trials (Mettler & Kellman, 2014). Although PALM technology was developed for visual stimuli, perhaps it can train for dynamic, temporal stimuli to support auditory pattern recognition.

Music, in particular, is a useful auditory domain in which to study pattern recognition because of its many patterns at many levels of complexity and abstraction which allows research into auditory perception across the spectrum from basic processing to high-level real-world tasks.

Identifying composers' styles is a complex and abstract auditory pattern recognition task which often has been described by musicologists, but seldom has been empirically studied by psychologists.

Research Questions

How can we improve abstract pattern recognition in the auditory domain?

Can principles that enhance visual learning be extended to auditory stimuli, such as music?

References

Gibson, E. J. (1969). *Principles of perceptual learning and development*. New York, NY: Appleton-Century-Crofts.
Mettler, E., & Kellman, P. J. (2014). Adaptive response-time-based category sequencing in perceptual learning. *Vision Research*, 99, 111-123.

Acknowledgements

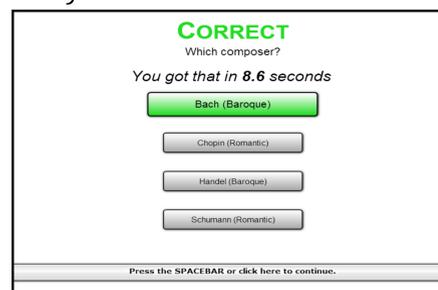
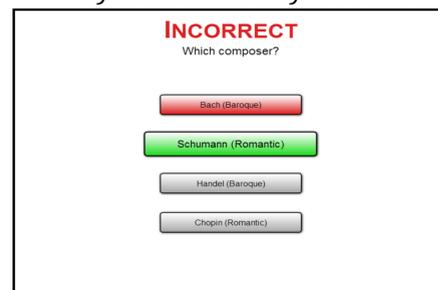
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Method

Procedure:
Pretest → PALM → Posttest

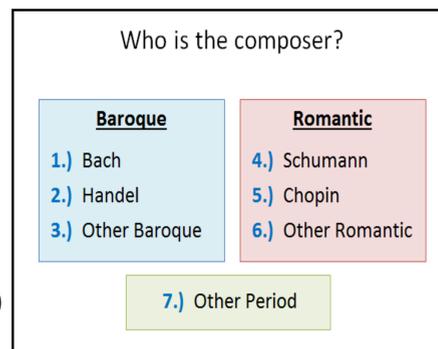
PALM

- Train undergraduate participants to classify classical piano music by style of 4 composers: 2 Baroque, 2 Romantic
- 100 clips per composer
- For each trial, participants
 - listened to a 15 second clip
 - identified the composer and received feedback
- Participants completed 45 minutes of the PALM for 7 days or until they reached mastery

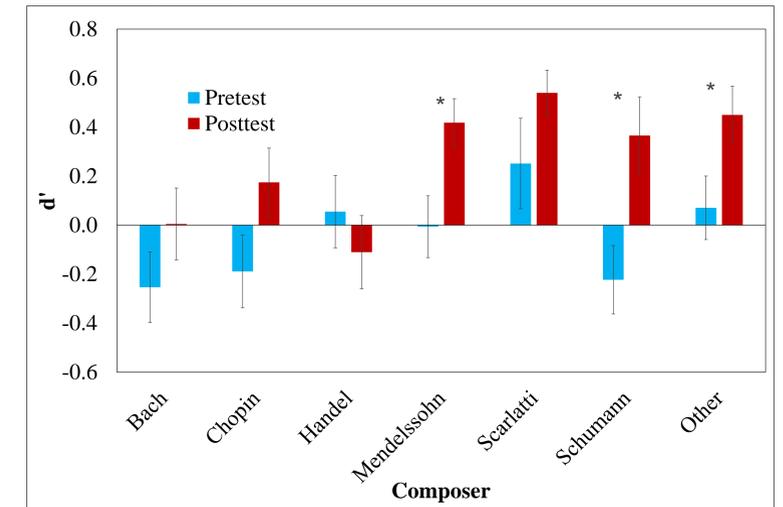


Pretest and Posttest

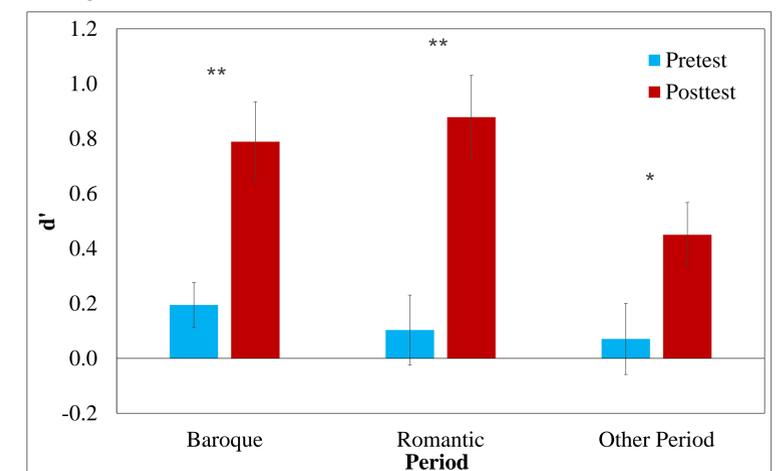
- 24 clips from 8 composers
- 4 PALM-trained composers:
 - 2 Baroque (Bach, Handel)
 - 2 Romantic (Chopin, Schumann)
- familiar clips (included in PALM) & novel clips by each
- 4 untrained composers:
 - 2 from trained periods (Baroque: Scarlatti; Romantic: Mendelssohn)
 - 2 from untrained periods (Renaissance: Byrd; Post-Romantic: Debussy)



Results (n=41)



*p<.05



*p<.05 **p<.001

Discussion

After PALM training, participants improved in recognition of both composer styles and period styles.

Results suggest that PALM technology can train the recognition of relevant abstract patterns in music.

Thus, perceptual learning interventions may also be effective in improving information pickup in other auditory domains, including verbal language.