Effects of Extended Training on an Incidental Auditory Category Learning Task

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Introduction

- Speech perception is a categorization task (Lim, Fiez, & Holt, 2014)
- Acquiring second-language speech categories is difficult; how to optimize training?
- Dual systems of category learning
  - Acquiring second-language speech categories is difficult.

- Incidental training task
  - Other paradigms have mostly used explicit training.
  - In speech category learning, this is not very effective (Lively, Logan, & Pisoni, 1993; Logan, Lively, & Pisoni, 1991).
- Speech categories are integral and overlapping (more like II categories)
- Examine learning during an incidental task to engage procedural learning system engaged during II category learning
- Spaced training and consolidation
  - Impacts speech category learning (Earle & Myers, 2014, 2015)
  - Could this change the way that II (distributed like speech categories) or RB categories are learned?

Questions

- How does spaced training (allowing consolidation to occur) change the way that II and RB categories are learned?
- What are the effects of spaced training in an incidental category learning task?

Methods

Conditions (Stimulus Distribution x Task)

Stimulus Distributions:
1. Rule-based
2. Information-Integration

Task: Systematic Multimodal Associations Reaction Time (SMART) task:
1. One Day Training
2. Two Day Training

Procedure

One Day Training

- RB, n = 11
- II, n = 10

Two Day Training

- RB, n = 18
- II, n = 14

Generalization—Explicit Measure of Learning

- Single day, massed training: RB > II, but in spaced, two day training with the same number of trials, there is no significant difference between RB and II

Results

Reaction Times—Incidental Measure of Learning

1 Day Reaction Times

2 Day Reaction Times

Post-Test Accuracy

Conclusions

- In incidental task, replicate RB > II (1 day), but this advantage was reduced with the same number of trials spread across 2 days
- Role of consolidation in speech category learning
  - Inability to explicitly reason
  - Due to spaced training?
- Due to incidental task?
- Generalization of incidental learning to novel stimuli
- Other aspects of experimental design are important in determining how categories will be learned best: not just stimulus distributions.
- Support for consolidation’s role in auditory category learning for certain types of problems

Participants

53 Carnegie Mellon University undergraduates (n = 21 One Day, n = 32 Two Day)