Goal

To assess age differences in implicit learning of higher order non-spatial auditory sequences in the absence of spatio-motor response sequencing.

Abstract

The Serial Reaction Time (SRT) task has been used to investigate implicit learning and aging of both visual and auditory sequences. While both age groups demonstrate learning, deficits occur in the magnitude of learning for complex sequences (e.g., Dennis, Howard, & Howard, in press). Theories of sequence learning suggest that people may learn contingencies among perceptual stimuli, responses, or a combination thereof. However, because previous research has employed a one-to-one stimulus-to-response mapping, it is unclear what role motor sequencing plays in learning or age-related deficits. The present study examines implicit sequence learning and aging when the stimulus-to-response mapping changes on every trial. This technique was introduced by Goschke (2001) to investigate sequence learning in the absence of motor sequencing. Previous research has found age constancy in learning of first order sequences (Dennis, Howard, & Howard, 2002). However, the young adults gained explicit knowledge of the simple sequence structure, contaminating implicit learning measures. The current study examines a more purely implicit process by investigating sequence learning of more complex, lag 2 sequences (e.g., 1r2/3/4r, where r denotes a randomly selected event). Results indicate that both young and elderly adults show evidence of sequence learning under constant response mapping conditions, but demonstrate deficits with random response mapping. This suggests that the random response mapping interferes with other learning or performance on higher-order sequences.

Method

• Participants: 8 young and 8 elderly in each condition (Constant response mapping / Random response mapping)

• Sequence structure: each participant received one of two different lag 2 sequences:
  - Sequence 1: 1r2r3r
  - Sequence 2: 1r2r3r

• Practice: 1 block of 30 structured trials

• Task: 40 structured blocks (60 trials each) over 2 days

• Explicit assessment: recognition task & exit interviews

Are there age differences in the constant response mapping condition?

Age differences in recognition?

Conclusions

- Both young and elderly exhibit sequence knowledge under the constant response mapping condition. However, elderly exhibit an age deficit compared to young.
- There is some evidence that young are able to learn a lag 2 sequence in the absence of spatio-motor sequencing, but the elderly cannot.
- Evidence of learning in young adults under the random response mapping condition suggests that motor sequencing is not essential for learning.
- Neither group shows evidence of explicit knowledge on the recognition test or end-of-session questionnaires in either condition.

References


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