Visual long-term memory guides attentional selection during serial reaction time task

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Introduction

People store the sequence of items in their long-term memory when they need to respond to their spatial locations in serial reaction time task.

Serial reaction time task started with several blocks of repetitive visuo-motor sequence for people to learn the visuo-motor pairings. Later, a block of repetitive new sequences was presented. People showed longer RT when memory retrieval was disrupted by a new pattern.

We’re interested in if people’s eye prediction mirrored the formation, disruption and reactivation of the long-term memory effect we’ve seen from RT data.

Method

12 locations per sequence x 9 repetitions per block

500 ms ITI

Sequence A: (blocks 1-6 and 8)

Sequence B: (block 7, different from A)

Serial reaction time task: participants responded to the spatial location of the diamond using arrow keys (up/down/left/right). We recorded both reaction time and eye tracking data.

Response Time in SRT

Learning: In the first 6 repetitive blocks, participants responded faster.

Cost: Participants slowed down as the new sequence block appeared (block 7).

Recovery: As the repetitive pattern reappeared, participants got back to their faster RTs.

Eye Anticipation in SRT

Learning: In the first 6 blocks, subjects more accurately anticipated the target.

Cost: Less correct anticipation as the new sequence block appeared.

Recovery: As the repetitive pattern reappeared, recovered eye anticipation accuracy.

Conclusions

Qualitatively, an increase in eye prediction during learning and decrease in eye prediction during the random block mirrored the patterns we observed in RT changes.

Learning, cost and recovery in eye or RT patterns were associated with each other, suggesting a coherent learning mechanism underlying serial reaction time task.