5205

Working Memory Consolidation Improves Long-Term Memory Recognition in Words and Non-Words

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Introduction

Working memory influences long-term memory.

- Covert retrieval effects demonstrate how working memory can improve subsequent long-term memory (McCabe, 2008).

Attention is insufficient to create memory traces.

- Recent findings suggest that attention is insufficient to form stable memory traces (Chen & Wyble 2015).
- Working memory consolidation is necessary to form durable working memory representations (Chen & Wyble 2016).
- It remains unclear how working memory consolidation influences long-term memory performance.

Predictions

- Inducing working memory consolidation should lead to improved long-term memory.
- This effect should be stronger when prior representations exist for stimuli in long-term memory.

Results

Stimulus identification.

- Very high accuracy for both cue types across experiments

Delayed recognition,

- Clear effect of cue type in all experiments
- No effect of stimuli type in Experiment 3

Experiment	SI Difference	SI BF_{10}	DR Difference	DR BF_{10}
1	-0.5%	2.8	3.8%	3.7
2	-0.3%	.18	7.6%	3214
3 (Cue)	-1.2%	9	7.5%	2174
3 (Stimuli)	0%	.13	1.9%	.20
3 (Interaction)	N/A	.33	N/A	.25

Table 1. *Summary of results. Differences are Before-During, except for Experiment 3 Stimuli, which is Nonword-Word. SI = Stimulus Identification, DR = Delayed Recognition, BF_{10} = Bayes factor alternative hypothesis/null hypothesis.*

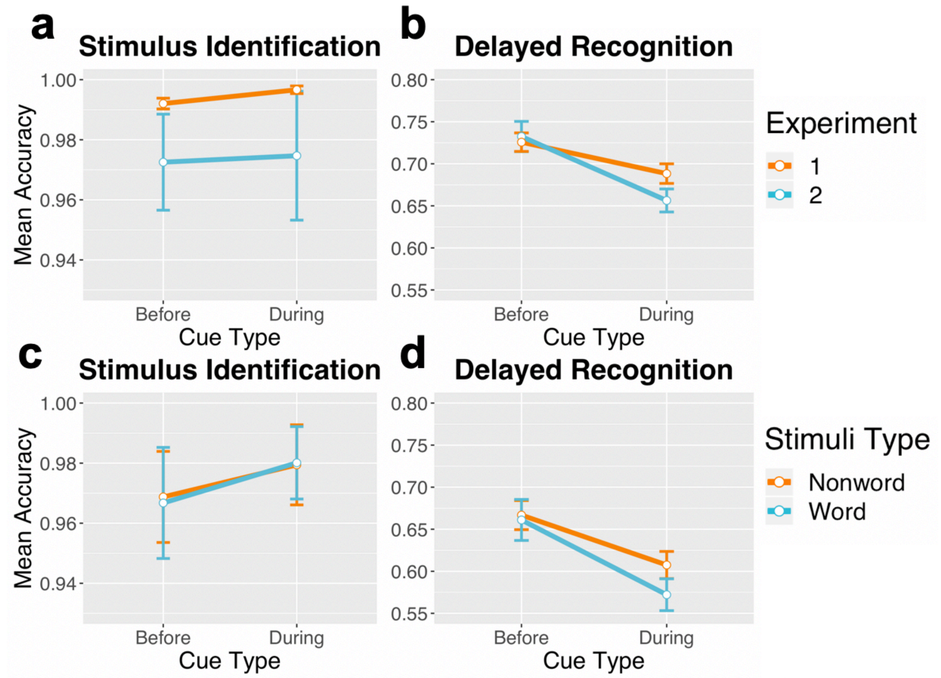

Figure 2. *A) Experiments 1 and 2 B) Experiments 1 and 2 C) Experiment 3 D) Experiment 3*

Method

Participants. Experiment 1 *N* = 46, Experiment 2 *N* = 44, Experiment 3 *N* = 40

Procedure.

- Stimulus identification, two possible conditions:
  - **During-cue**: blank screen preceded response set and target item
  - **Before-cue**: target item briefly presented and removed, followed immediately by response set
- Delayed recognition: one item from previous task and novel item
- Participants indicated level of confidence that they had seen item during stimulus identification
- **Changes in Experiment 2**
  - Brief blank screen inserted between target presentation and response set during stimulus identification
- **Changes in Experiment 3**
  - Same procedure as Experiment 2
  - Included both words and nonwords as stimuli

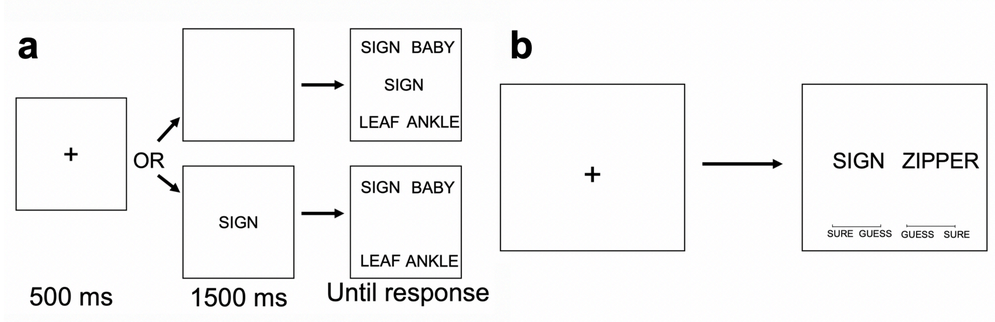

Figure 1. *General procedure used for Experiment 1. Experiments 2 and 3 included an additional 2000 ms blank screen between the target and response set presentation. Experiment 3 included both words and nonwords as stimuli.*

Conclusion

Working memory consolidation improves delayed recognition.

- Better performance on delayed recognition for words originally presented in Before-cue condition compared to During-Cue condition in all experiments
  - Only before-cue conditions required working memory consolidation
- Experiments 2 and 3 used a brief delay between cue and search
  - Ensures that working memory consolidation occurs

Words and non-words show similar effects.

- No effect of stimuli type (Words/Nonwords) in Experiment 3
- No interaction between Cue and Stimulus Type in Experiment 3
  - Suggests that the existence of pre-existing representations are not needed for the cue effect