# Examining the effects of memory compression with contralateral delay activity

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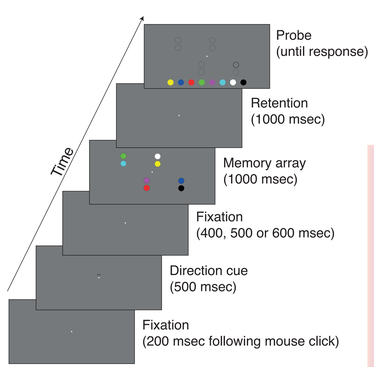
## Introduction

- The inclusion of statistical regularities in displays improves recall performance (Brady et al., 2009). One interpretation of this finding is that **a larger number of individuated objects are concurrently stored in VWM**.
- This effect appears to be contigent on explicit awareness of the regularities and the **slow recruitment of LTM representations** to elicit the improved performance (Huang and Awh, 2018).
- The CDA appears to be sensitive to perceptual grouping cues, which suggests the CDA indexes the **number of representations** (Luria and Vogel, 2014; Peterson et al., 2015).

**How does the CDA react to explicit chunking of stimuli?**

## Method



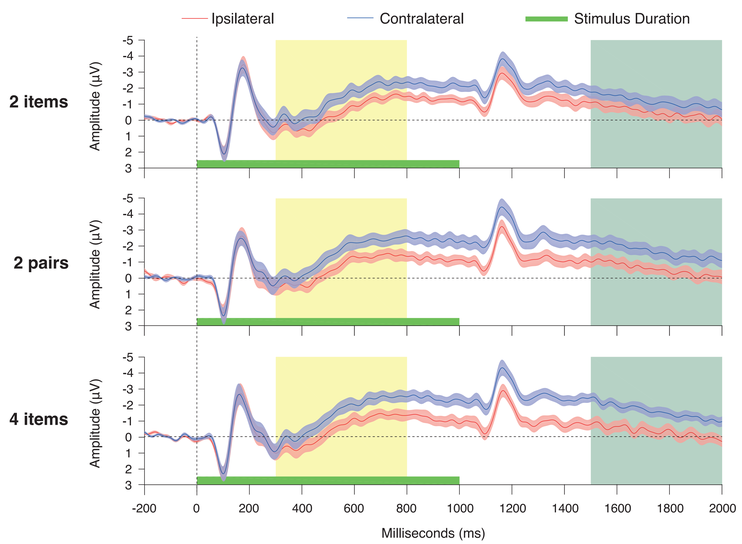

Eighteen subjects completed these three conditions (blocked):

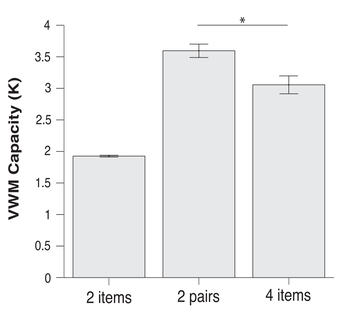
- **2 items** with no regularities
- **4 items** with no regularities
- **2 pairs** with consistent pairings and participants **explicitly informed of pairs**

Participants were explicitly tested for their knowledge of colour pairs at the end of the experiment

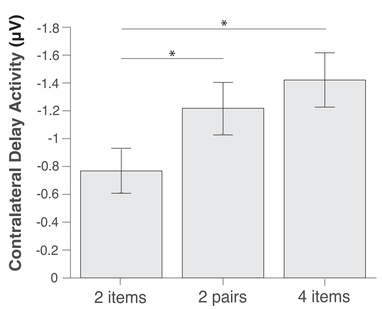
## Results

**Grand average waveforms across P3/P4, P5/6, P7/P8, PO3/PO4, PO7/PO8**



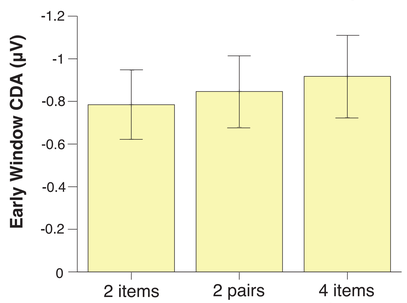




It appears participants were using explicit chunking to improve recall.

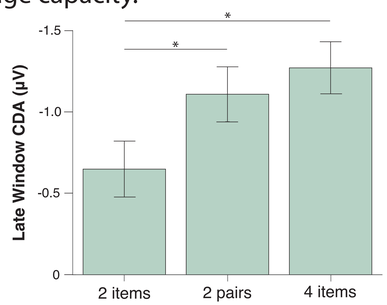



The CDA (1000 - 1900ms) in the 2 pairs condition does not drop to that of 2 items.

We also replicated the analyses of Xie and Zhang (2018) comparing familiar and unfamiliar stimuli. They found a larger CDA in an early window for familiar stimuli suggesting faster consolidation but no difference at a late window in line with equal storage capacity.




There appears to be no difference in rate of consolidation.




Storage capacity of 2 pairs does not appear to reduce to 2 items.

## Summary

- We replicate improved recall performance with statistical regularities but this appears **not** to be reflected in the CDA here
- Memory compression **does not** appear to rely on faster encoding or on an increase in the number of representations
- This data is consistent with **either** an information theoretic account or an "unpacking" account
- Extensive stimulus training may be required to produce observable changes to the CDA

## References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