No Evidence for an Object Working Memory Capacity Benefit with Extended Viewing Time

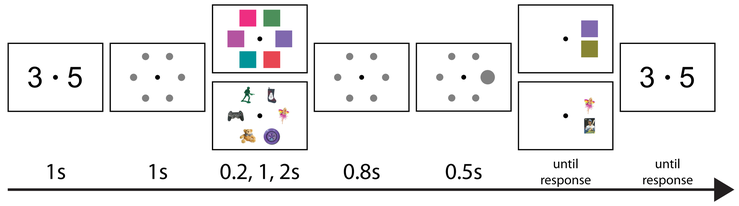
Colin Quirk[1,2] Edward Vogel[1,2]

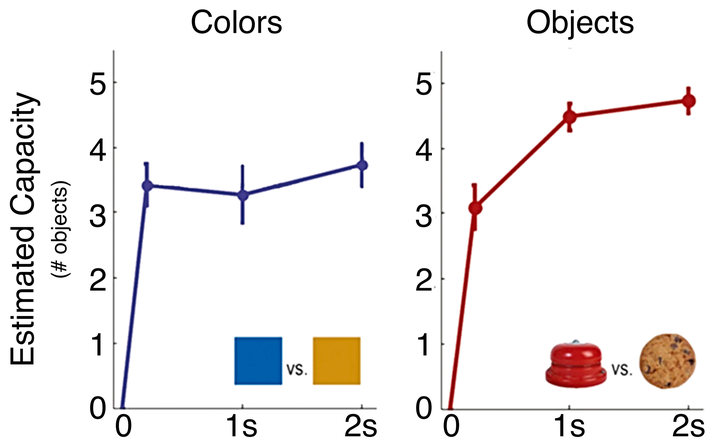
[1]Department of Psychology, University of Chicago [2]Institute for Mind and Biology, University of Chicago

Introduction

Does working memory have a higher capacity for real-world objects than colored squares?

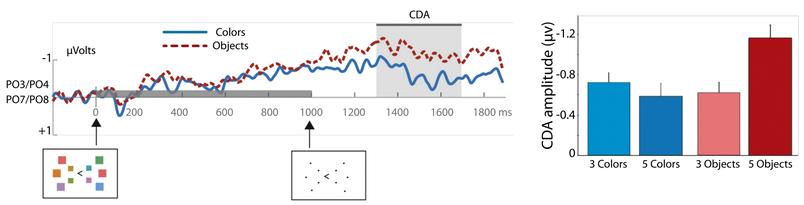
Brady et al. (2016) found evidence suggesting that, given sufficient encoding time, visual working memory has a larger capacity for real-world objects than simple colors.





Brady et al. (2016) Experiment 1 Results

n = 12



Brady et al. (2016) Experiment 3 Results

n = 18

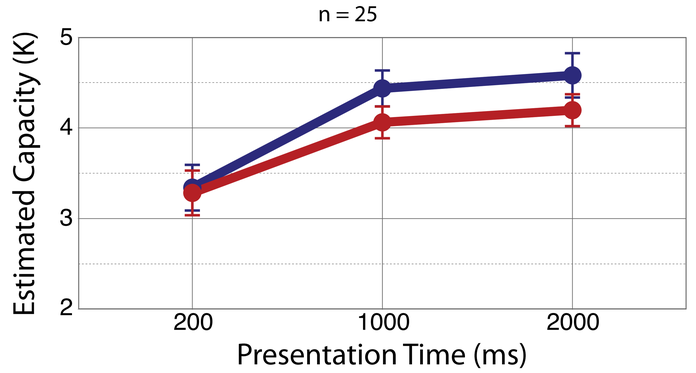
1. Performance benefit with extended viewing times
2. Performance benefit only for objects
3. Higher CDA asymptote for objects than colors

Behavioral Experiments

6 Colors 6 Objects

Experiment 1: Direct Replication

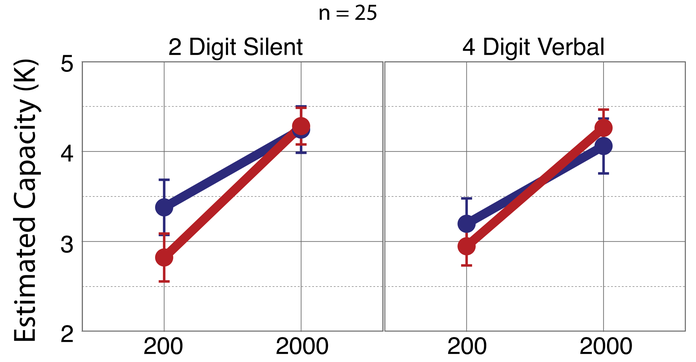
n = 25



✓ Time Benefit ✗ Object Advantage

Experiment 2: Increased Verbal Load

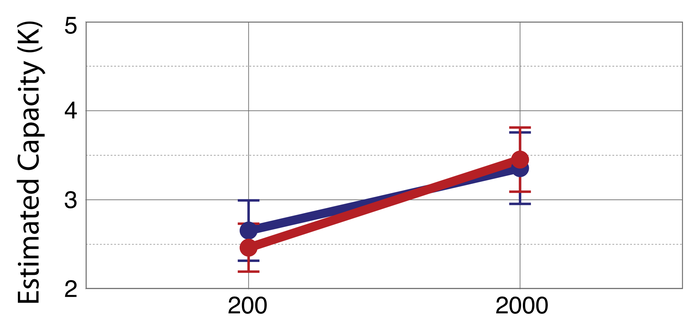
n = 25



✓ Time Benefit ✗ Object Advantage

Experiment 3: Intermixed Trials

n = 25

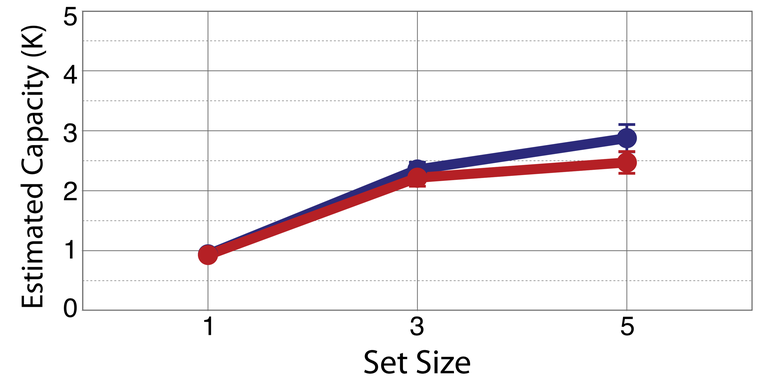


✓ Time Benefit ✗ Object Advantage

EEG Experiment

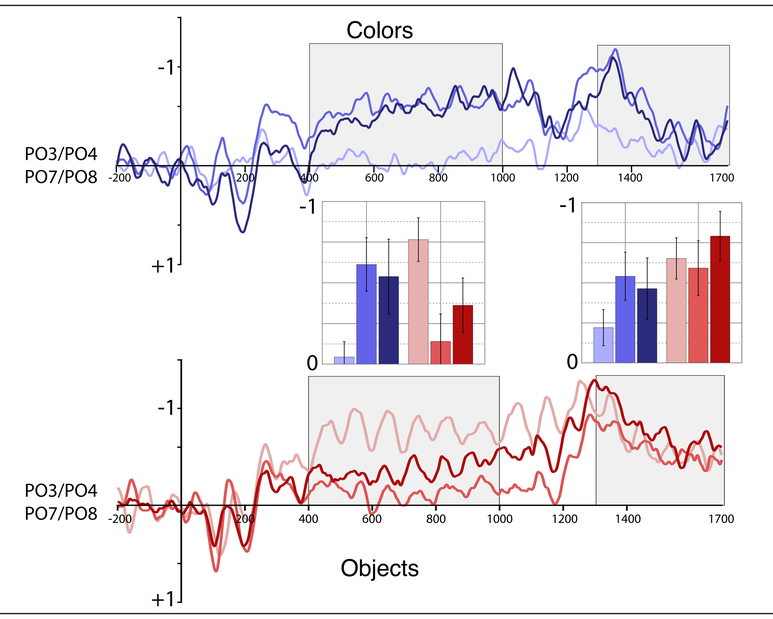
Experiment 4: CDA Replication

n = 25



Colors: Set Size 1 Set Size 3 Set Size 5

Objects: Set Size 1 Set Size 3 Set Size 5



Conclusions

Over 3 separate behavioral experiments (n=75), longer encoding times increased performance, but no object advantage was found.

The CDA experiment did not show an asymptote above 3 items, suggesting this increase was not due to an increase in working memory capacity.

References:

Brady, T.F., Störmer, V.S., & Alvarez, G.A. (2016). Working memory is not fixed-capacity: More active storage capacity for real-world objects than for simple stimuli. PNAS, 113(27), 7459-7464.

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