KNOWLEDGE ABOUT REAL-WORLD OBJECTS INFLUENCES VISUAL WORKING MEMORY CAPACITY

Ariel Starr, Mahesh Srinivasan, & Silvia Bunge   UC Berkeley

Building Blocks of Cognition

Language & Cognitive Development Lab

INTRODUCTION

How does our knowledge about the world influence what we remember?

Recent work suggests that VWM capacity in adults is greater for real-world objects than for colors or abstract shapes[1,2]

This benefit is hypothesized to stem from the presence of representations in LTM for real-world objects

If LTM representations are needed to produce this benefit, VWM capacity should vary for familiar vs. unfamiliar objects

METHODS

Change detection paradigm with familiar and unfamiliar objects

Adults

5 items per array, 3 encoding durations (300/1000/2000ms)

- Familiar vs. unfamiliar objects (N = 20)
- Familiar vs. unfamiliar objects w/ verbal interference (N = 21)
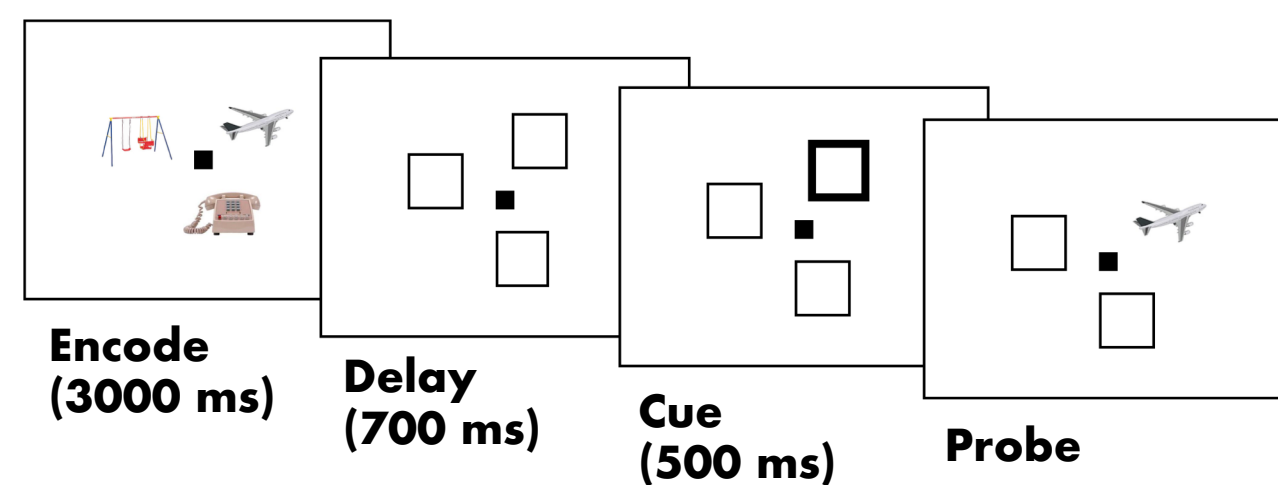
Older Children (6-9 years)

4 items per array, 2000ms encoding duration

- Familiar vs. unfamiliar objects (N = 18)

Younger Children (4-5 years)
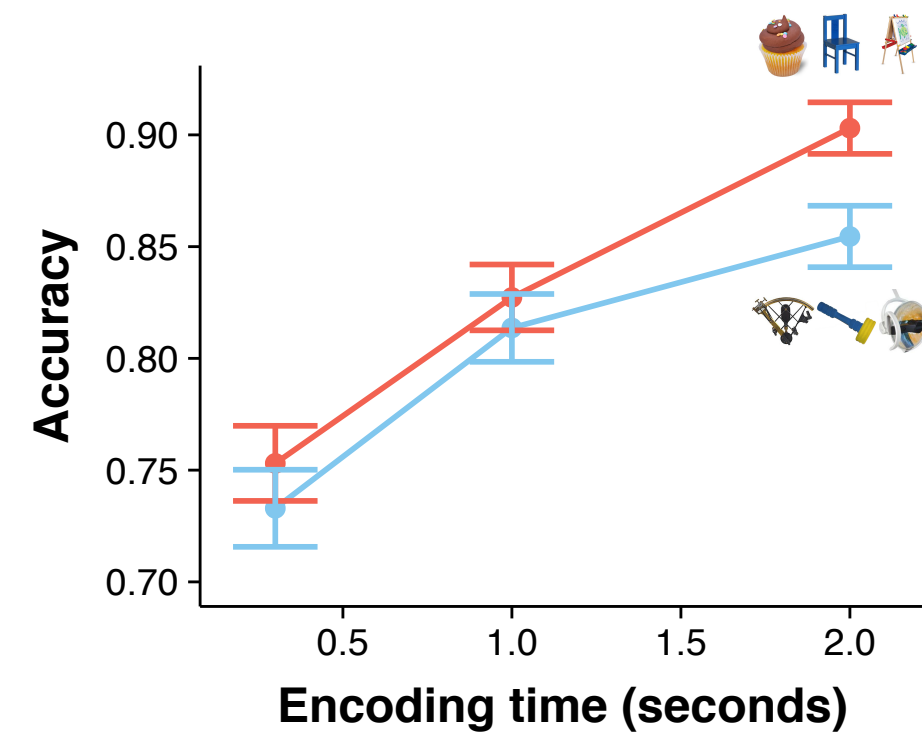
3 items per array, 3000ms encoding duration

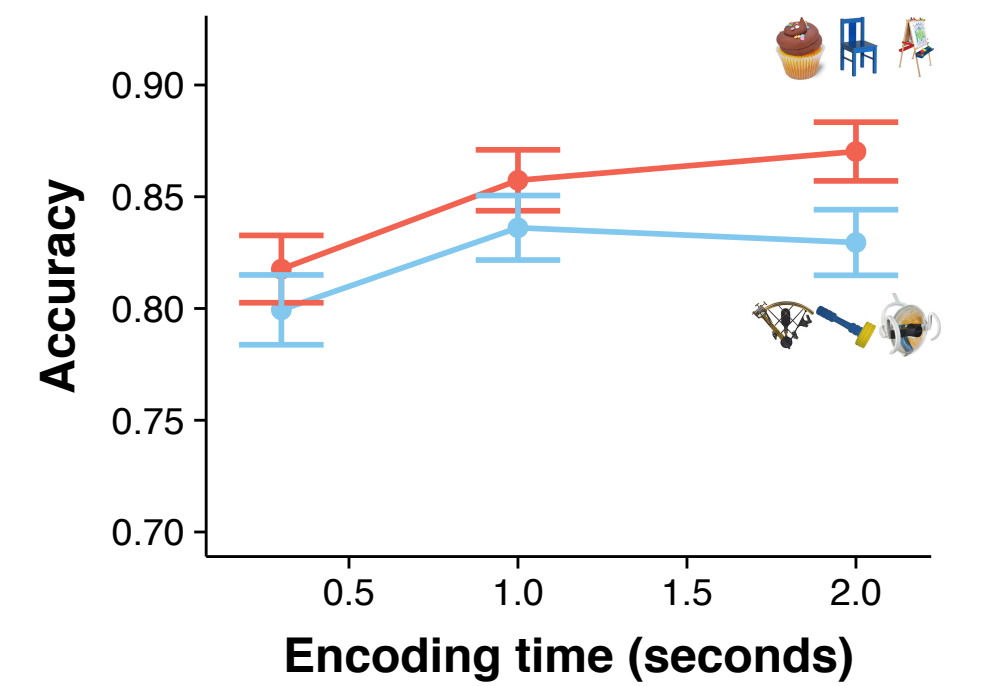- Familiar vs. unfamiliar objects (N = 19)

Encode (3000 ms) **Delay (700 ms)** **Cue (500 ms)** **Probe**

Task schematic (Younger child version)

RESULTS

Adults

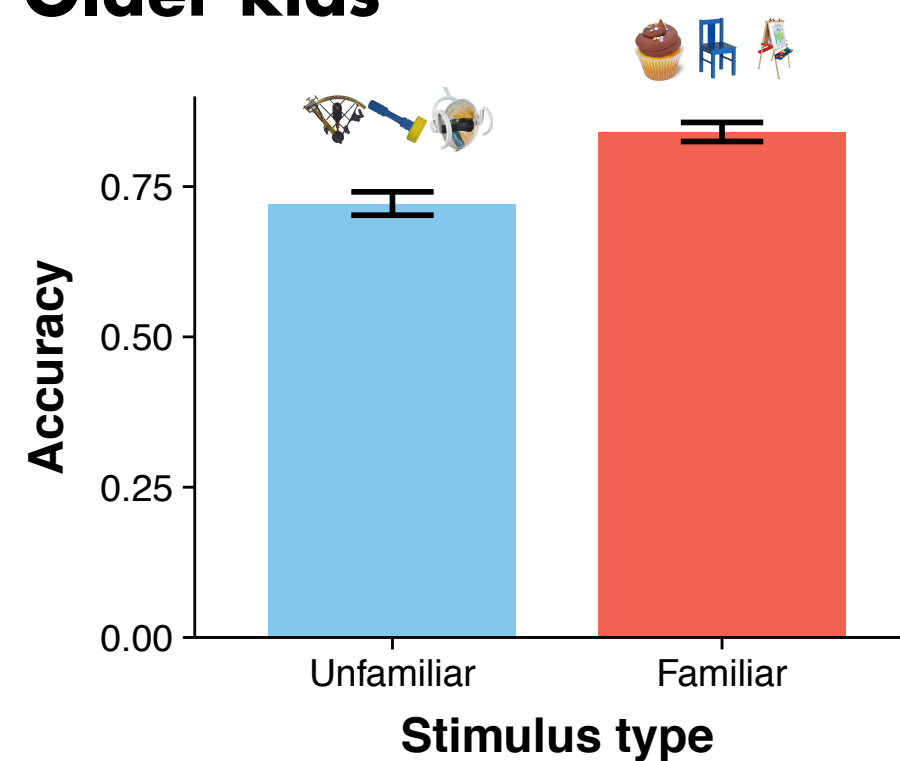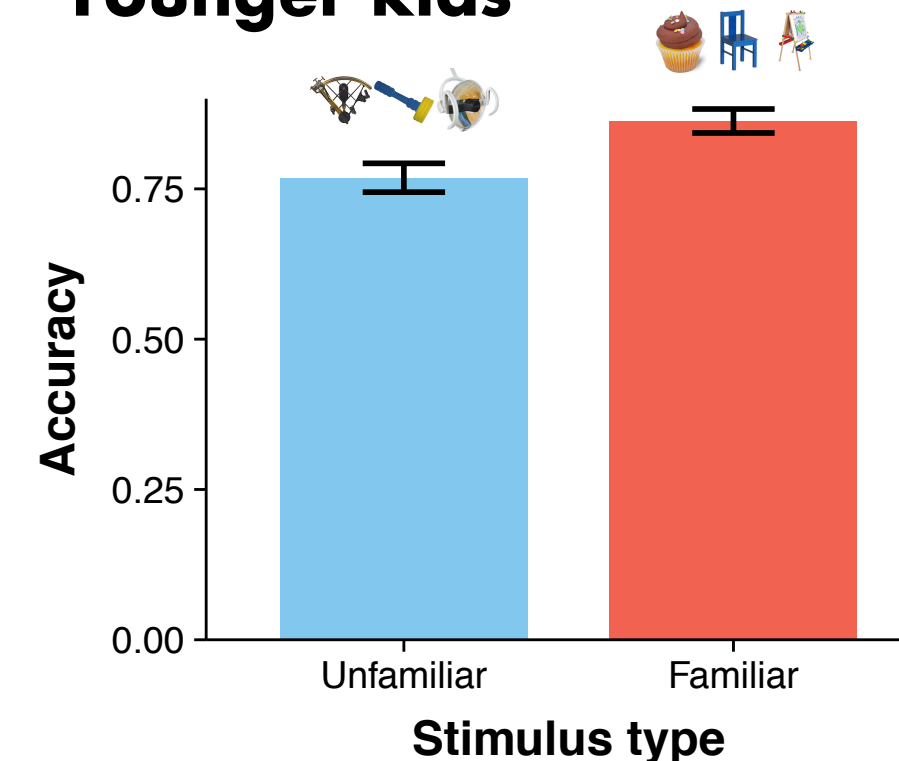**Adults (with verbal interference)**

Benefit for familiar objects emerges at 2 seconds of encoding

Verbal interference does not minimize the effect

Older kids

Younger kids

Older and younger children exhibit a similar benefit for familiar objects

Response biases change with age

- Unfamiliar
- Familiar

Older children & adults more likely to say that new unfamiliar objects are old

Younger children more likely to say that old unfamiliar objects are new
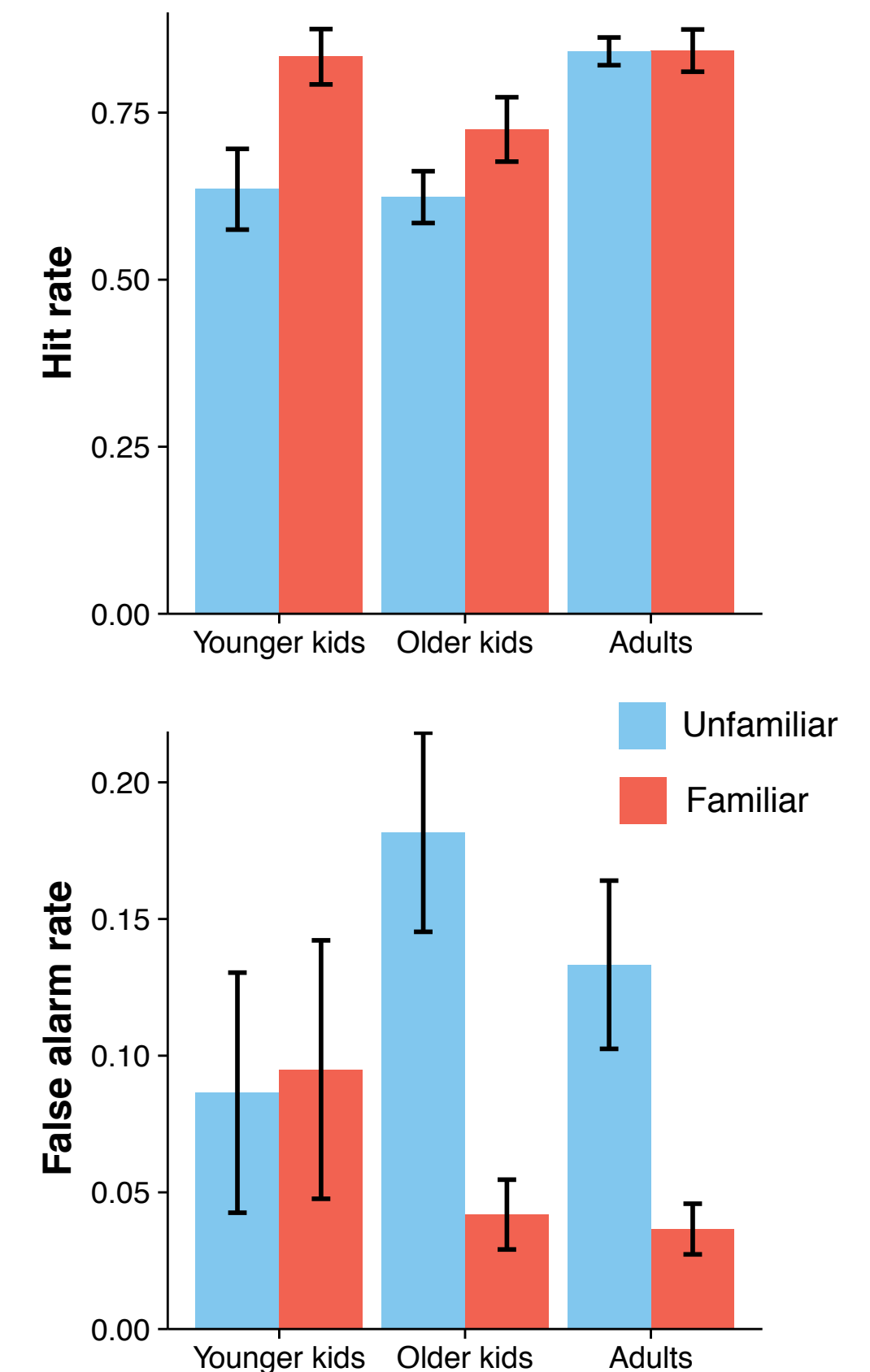
SUMMARY

VWM capacity is higher for familiar objects compared to unfamiliar objects

The benefit for familiar objects is already present in preschool-aged children

Knowledge about objects makes them easier to maintain in working memory

References:
1. Brady et al., (2014). *Commun Integr Biol.*
2. Brady et al., (2016). *PNAS.*

Questions? Contact arielstarr@berkeley.edu