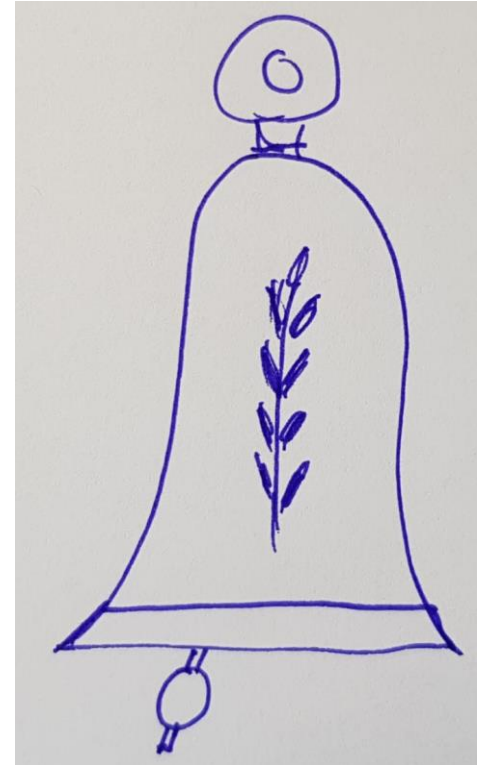


Drawing as an encoding tool to enhance item and associative memory: distinctive benefits in younger and older adults

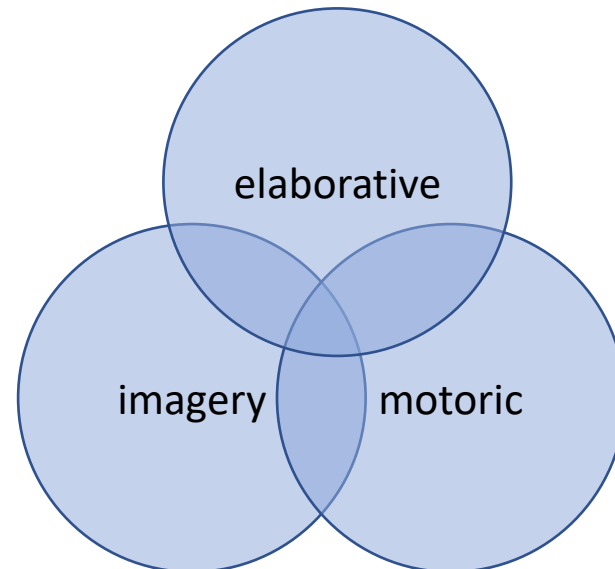
Rebecca Ovalle-Fresa and Corinna S. Martarelli

Swiss Distance University Institute



Background: Drawing

- **Definition:** drawing as encoding strategy:
“involves the **construction of an internal, nonverbal representation** that is mapped onto elements of the alternative, provided representation” (Van Meter & Garner, 2005)
- **Mechanisms:** combination of processes (Fernandes, Wammes & Meade, 2018)



Background: Drawing

- Drawing during encoding benefits **item memory** (vs. writing, mental imaging, etc.)
 - in younger adults (Wammes, Meade & Fernandes, 2016)
 - in older adults (Meade, Ahmad & Fernandes, 2020, Meade, Wammes & Fernandes, 2018)
- No study investigated drawing in **associative memory**



Background: Associative Memory & Age

- **Associative memory:** ability to build and remember associations
- Disproportional large **age-related decline**
- Spontaneous use of appropriate strategies to build and remember associations



Research Questions

Can **drawing** be used as an encoding tool to enhance **associative memory**?

Would **drawing** be effective to enhance **associative memory** of **older adults**?



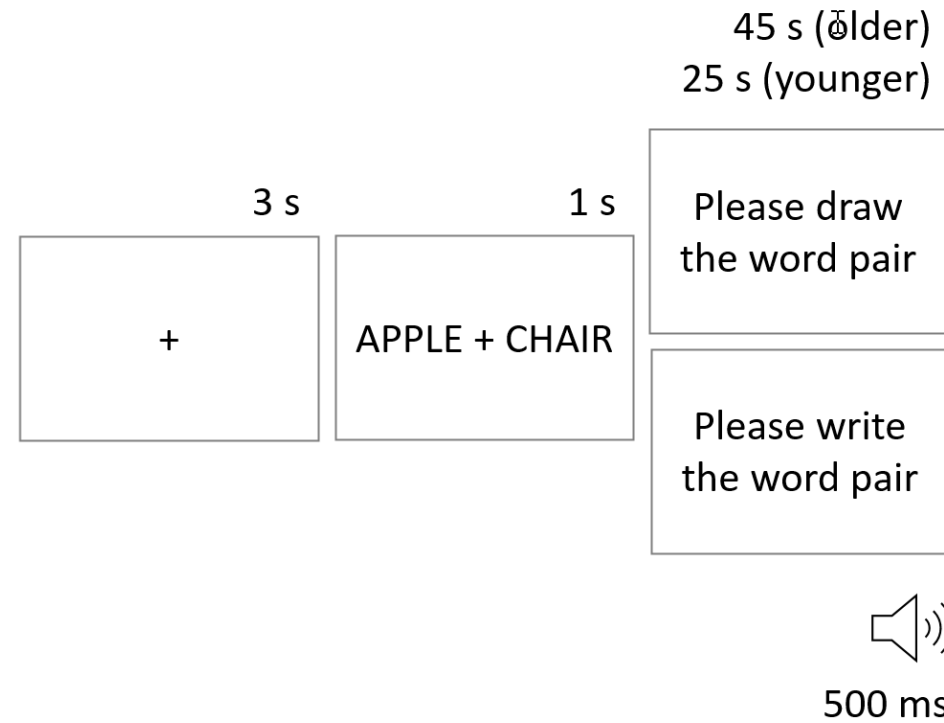
Methods: Participants

	Older	Younger	<i>t</i> (56) or	
Demographic Parameter	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	$\chi^2(1)$	<i>p</i>
<i>n</i>	29	29		
age	70 (4)	27 (5)		
gender distribution m/f/d	16 / 13 / 0	9 / 20 / 0	2.53	.112
educational level	4.38 (2.18)	4.69 (1.93)	0.57	.568



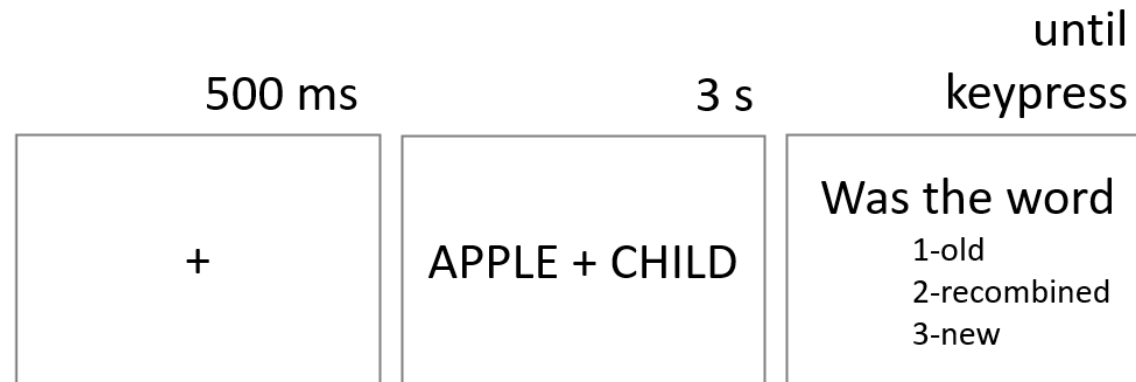
Methods: Recognition Memory Task

Encoding phase:



Methods: Recognition Memory Task

Recognition phase:



Methods: Recognition Memory Task

- Two blocks: drawing, writing (within participant)
- Counterbalanced order
- Procedure of one block:



Methods: Recognition Memory Task

- Two blocks: drawing, writing
- Counterbalanced order
- Procedure of one block:

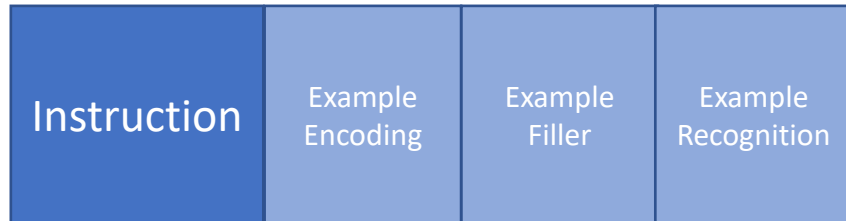


Instruction



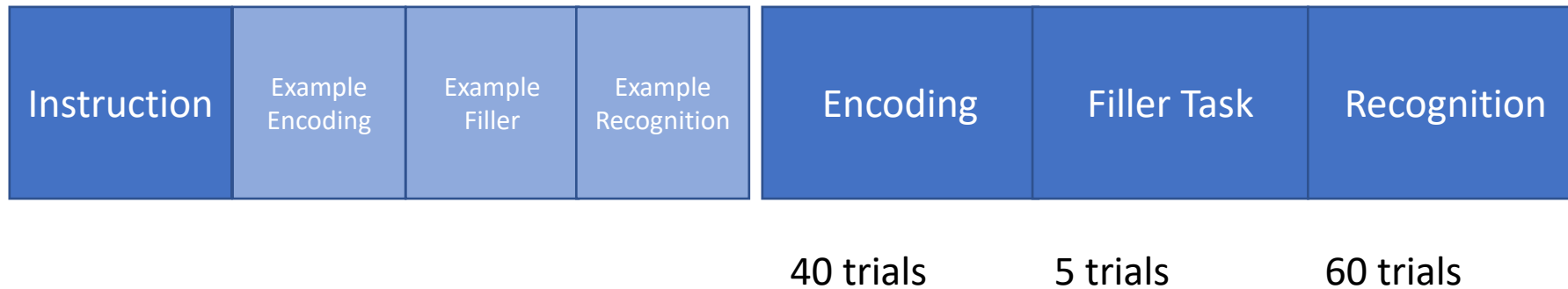
Methods: Recognition Memory Task

- Two blocks: drawing, writing
- Counterbalanced order
- Procedure of one block:



Methods: Recognition Memory Task

- Two blocks: drawing, writing
- Counterbalanced order
- Procedure of one block:

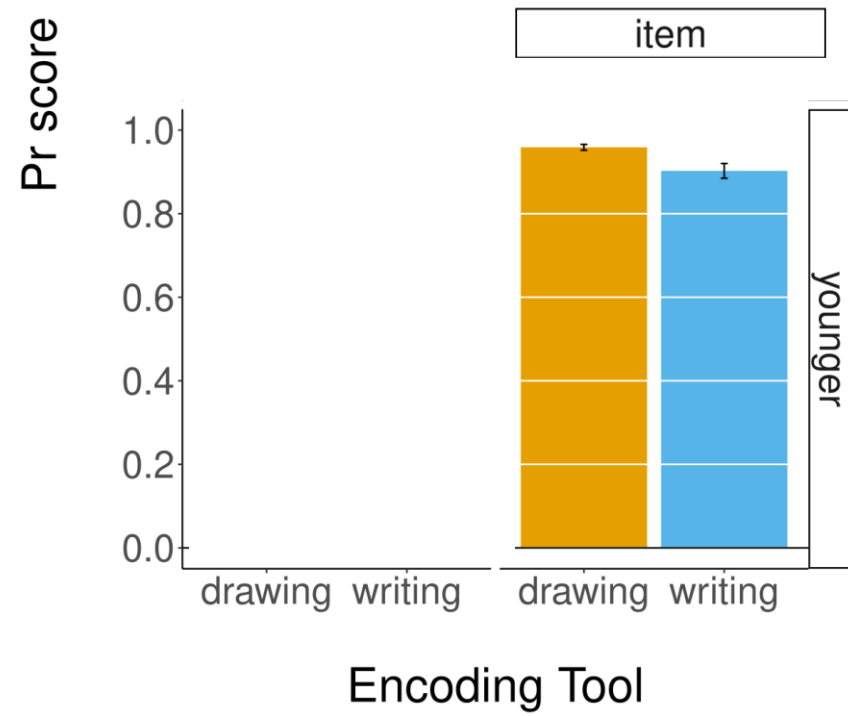


Methods: Pr Scores

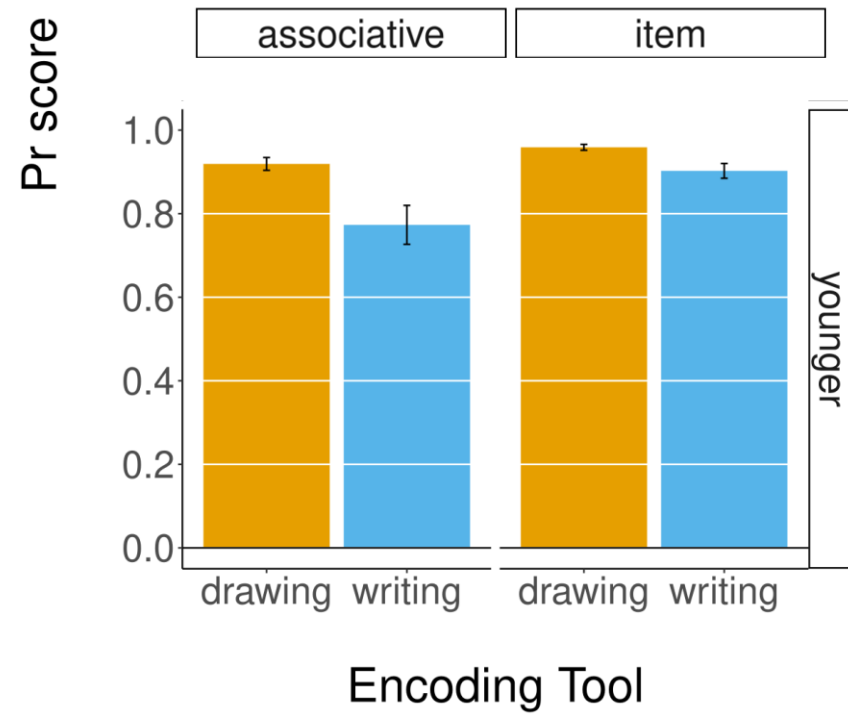
- Proportion of Hits – False Alarms (Kamp & Zimmer, 2015):
- **Item memory:**
 - no differentiation between old and recombined
- **Associative memory:**
 - Hits = correct responses to recombined word pairs
 - False alarms = recombined word pairs incorrectly considered as old



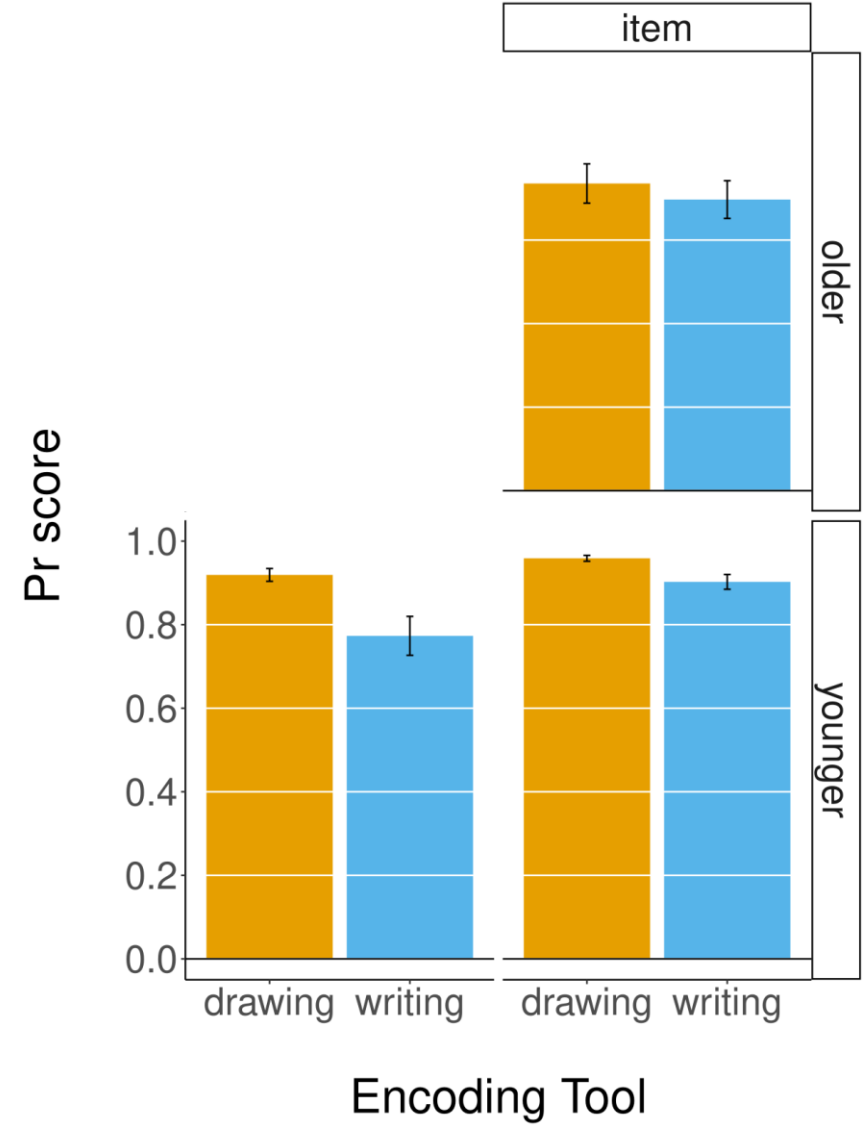
Results



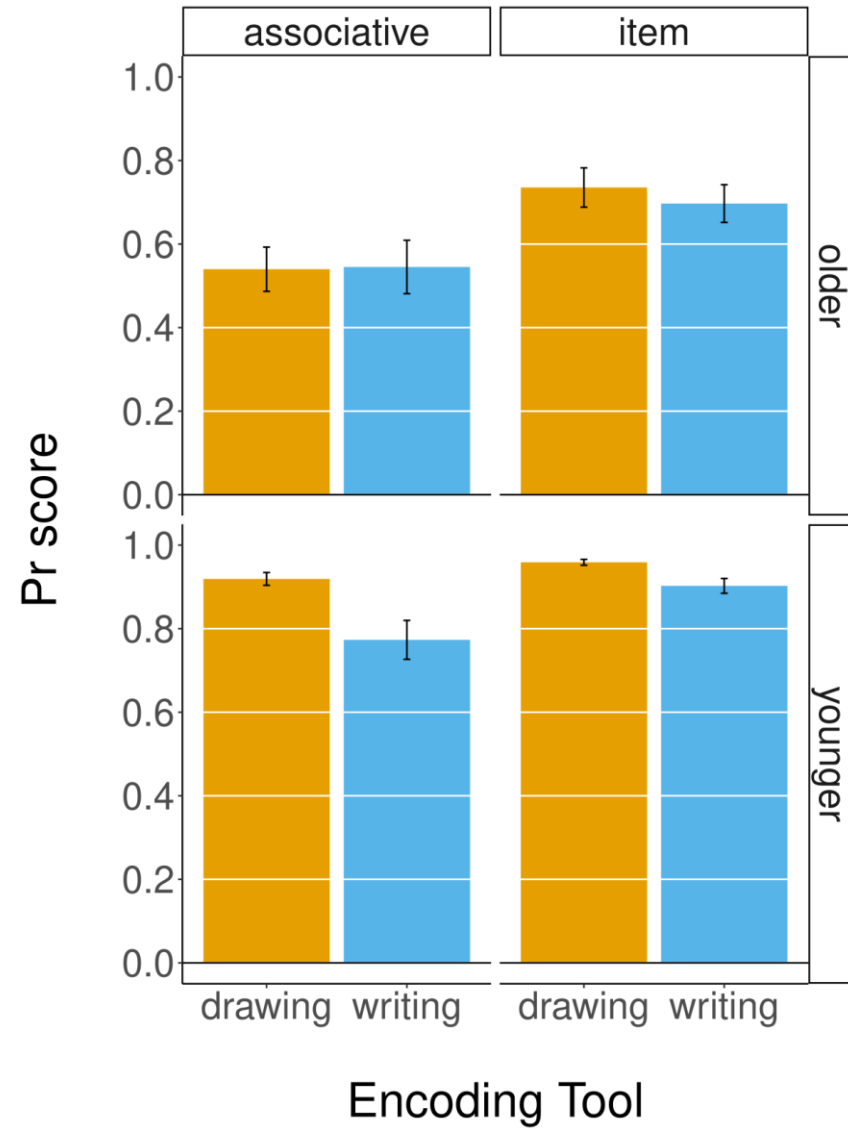
Results



Results



Results



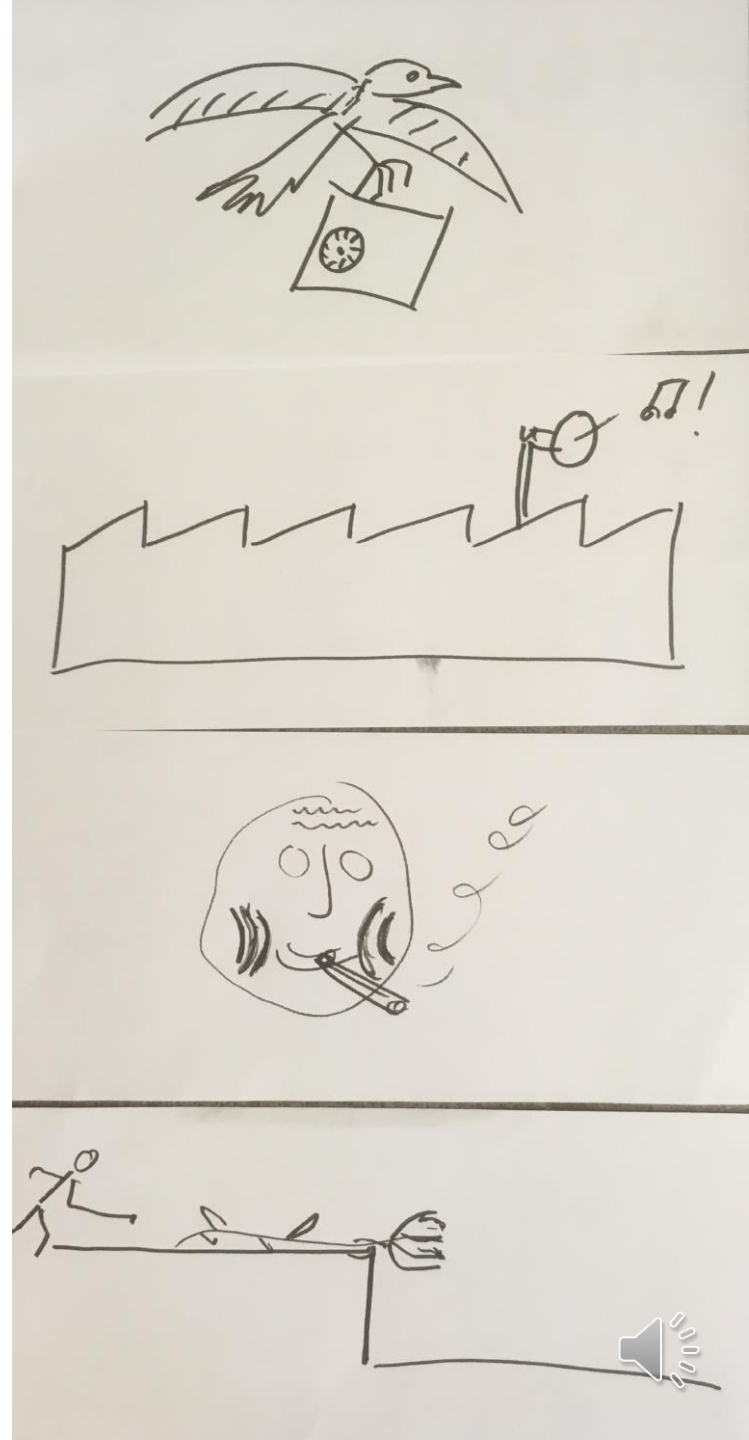
Summary

- **Item memory:**
 - **replication** of previous results, drawing enhances memory
 - in younger adults (and older adults)
- **Associative memory:**
 - **extension** of previous results in younger adults
 - but not in older adults



Conclusions

- First evidence that drawing is an **efficient encoding tool for associative memory** in younger adults
- Drawing of associations seems to initiate **distinctive cognitive processes** in older than younger adults



Thank You