The Effect of Aging and Working Memory Capacity on Interference Susceptibility

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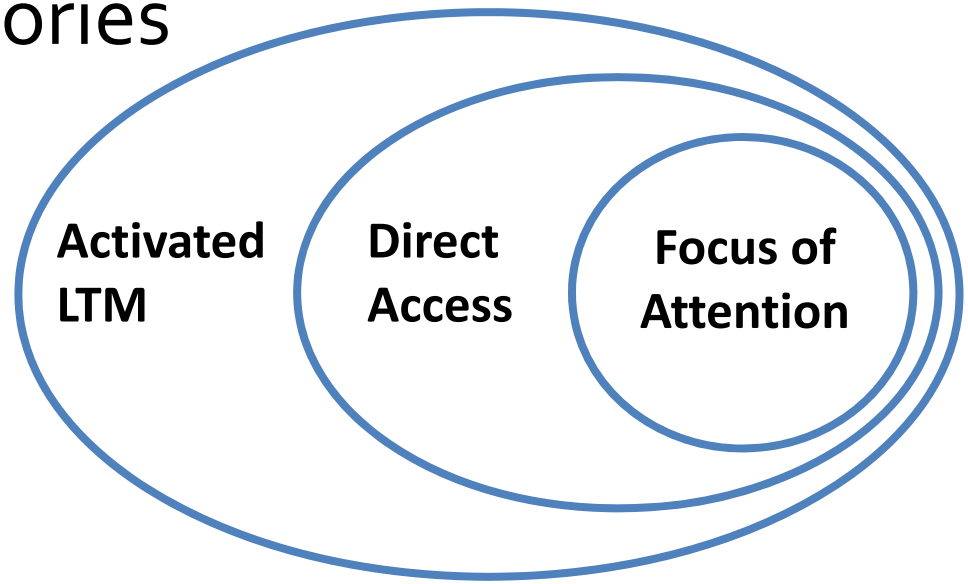
Background

- Working memory
  - Ability to simultaneously maintain and manipulate information

- Working memory theories
  - Oberauer (2002)



Background

- Working Memory Capacity (WMC)
  - Determined by automated operation span task
  - High WMC young adults
  - Low WMC young adults
  - Older adults (low WMC)

Repetition-Detection

- Instructions
  - Find repeated stimulus in EACH series
  - Hold onto repeat and identify at the end of the trial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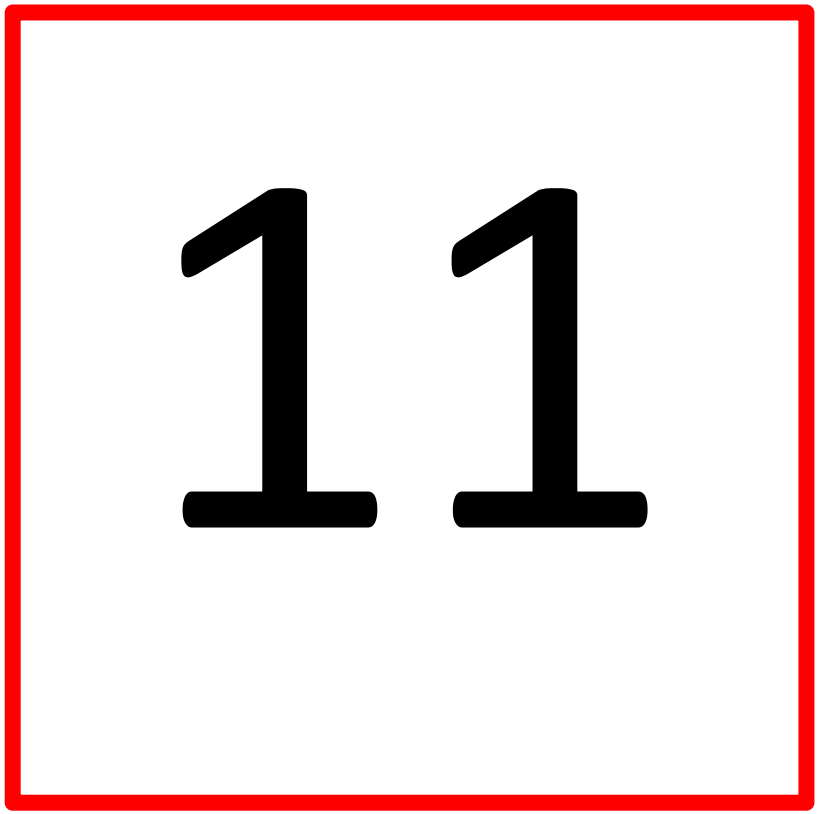
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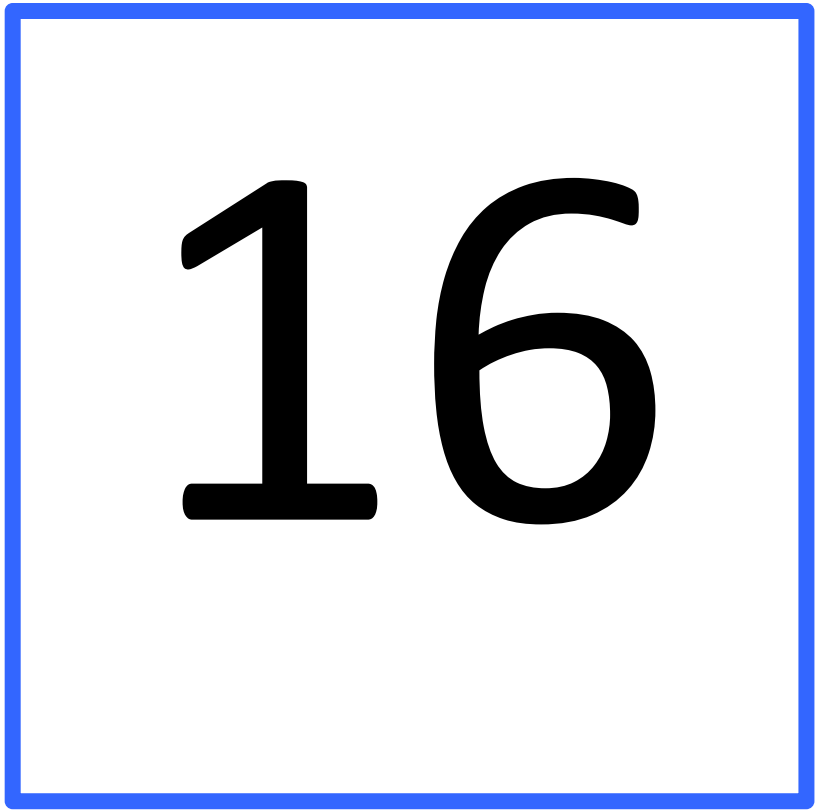
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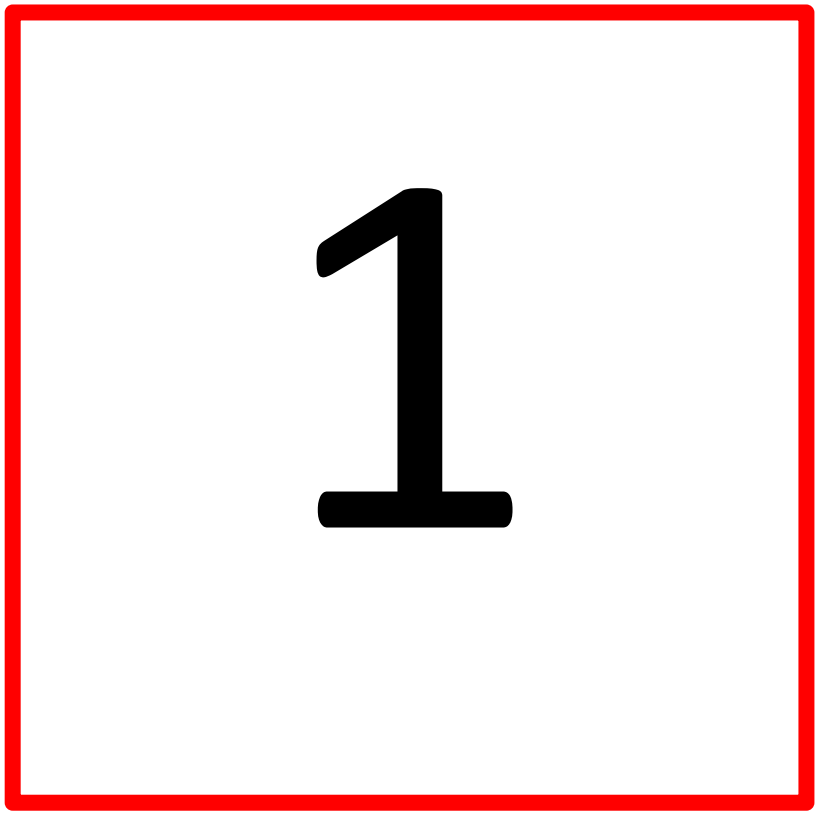
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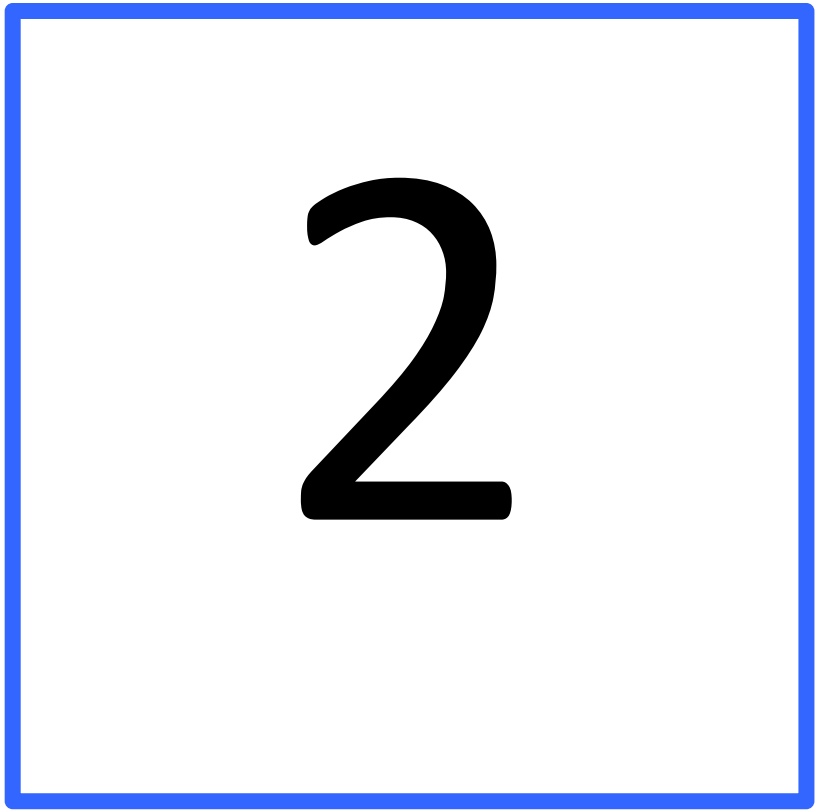
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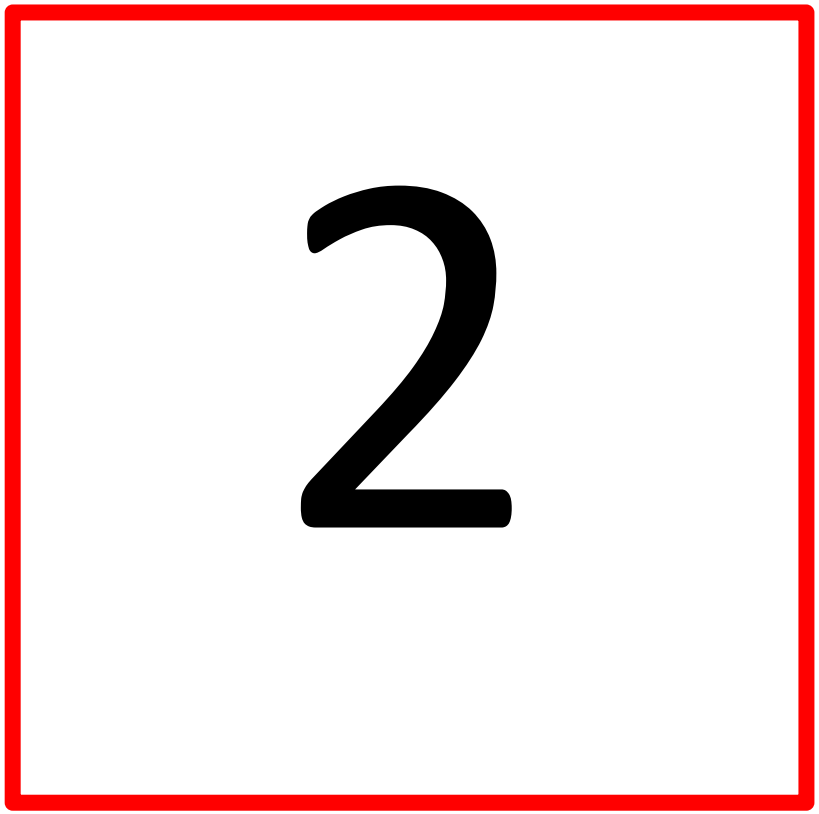
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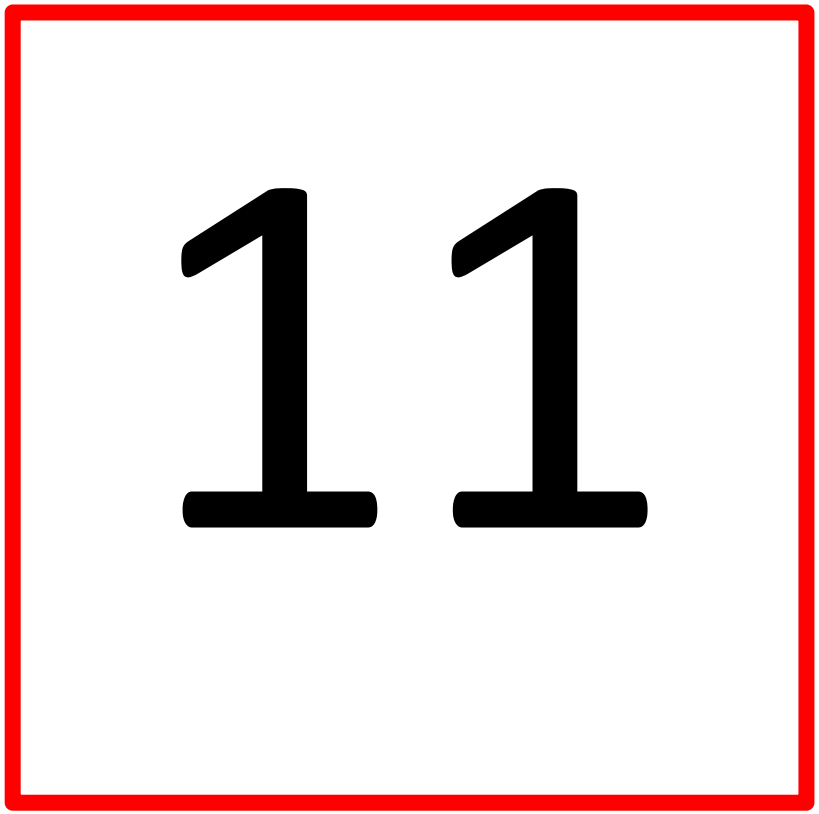
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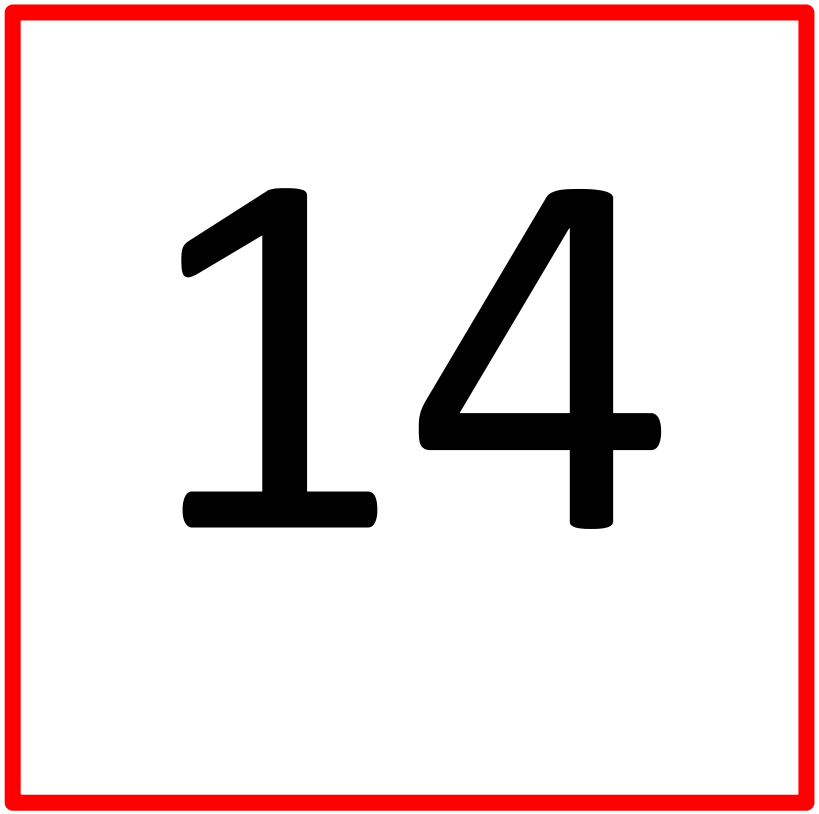
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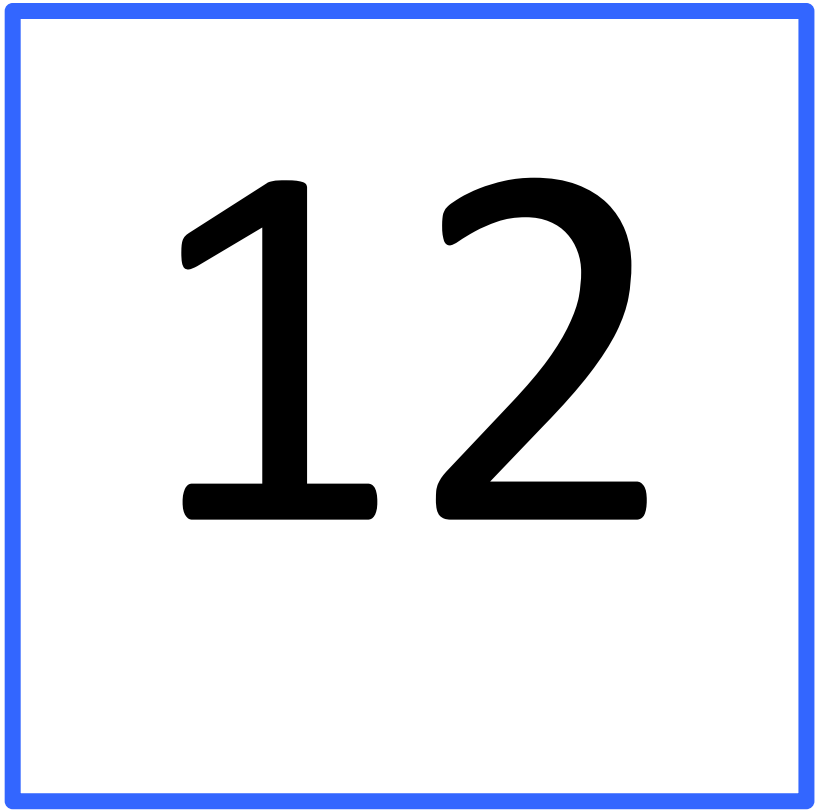
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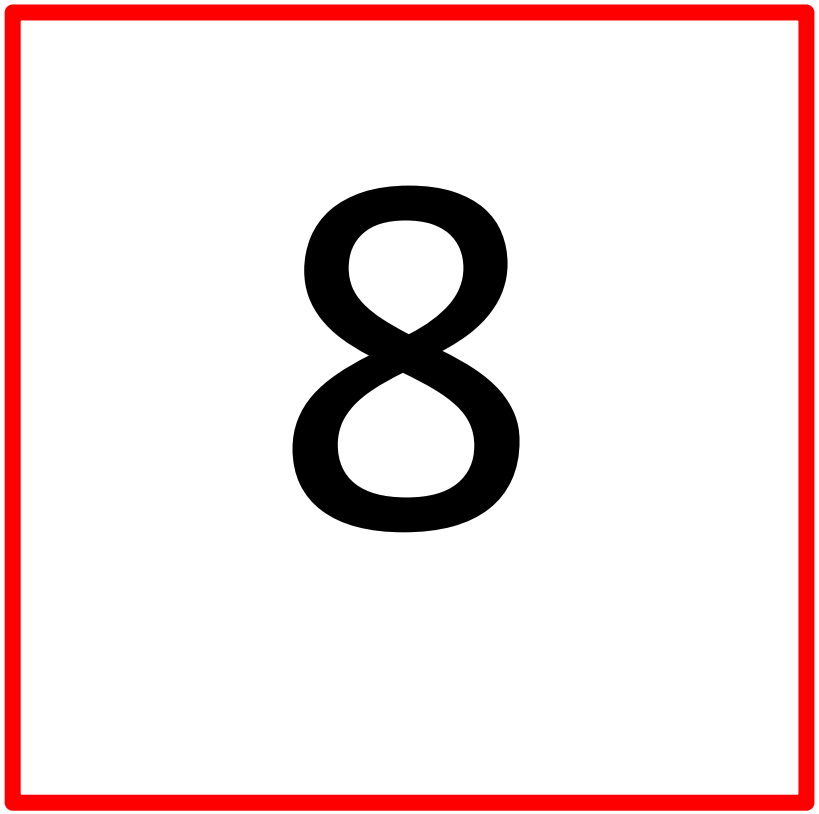
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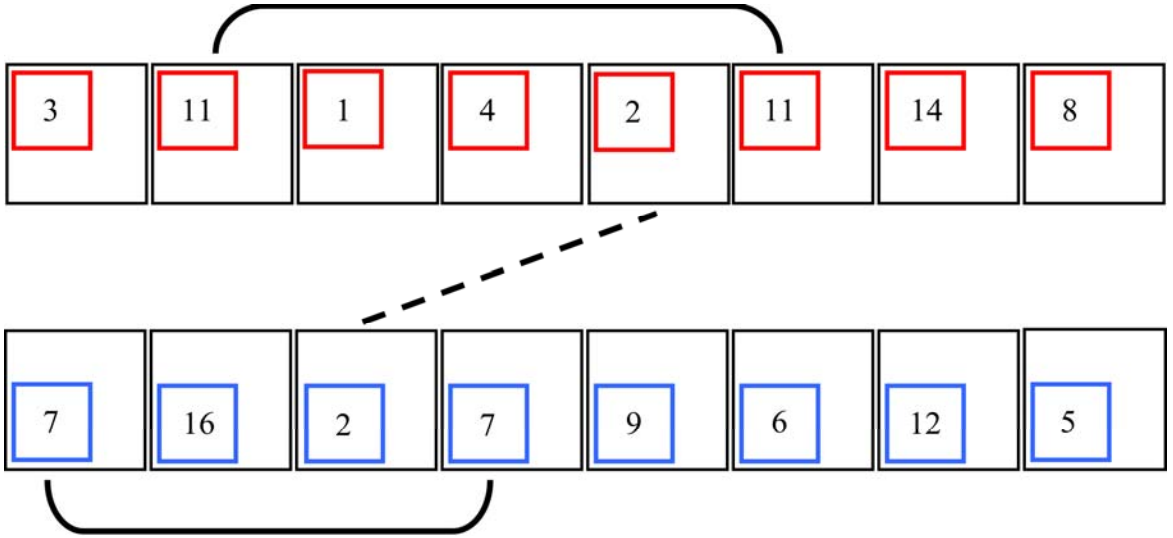
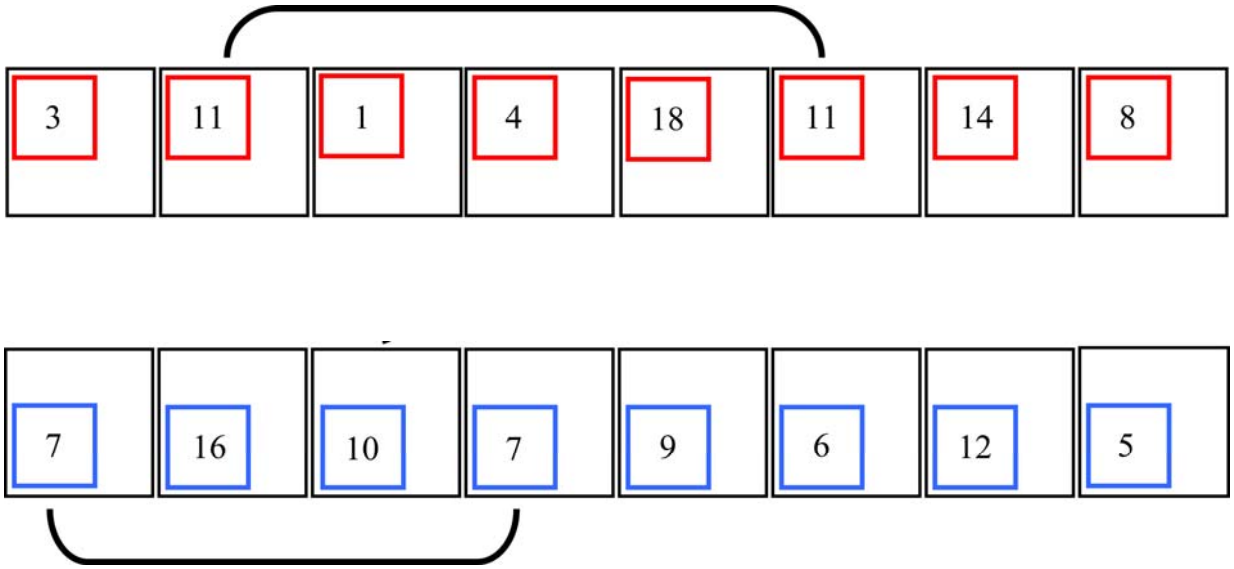
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

Repetition-Detection Experiment



Cross Repeat Condition



No Cross Repeat Condition

Current study

- *Hypothesis*: Working memory capacity (WMC) modulated by ability to hold items during interference
- Memory processes
  - Familiarity
  - Recollection
- Types of interference effects
  - Cross-repeat requires "binding"
  - Intervening items between repeat and end of trial
- Why repetition-detection?
  - To isolate interference effects
  - Familiarity versus recollection

Method

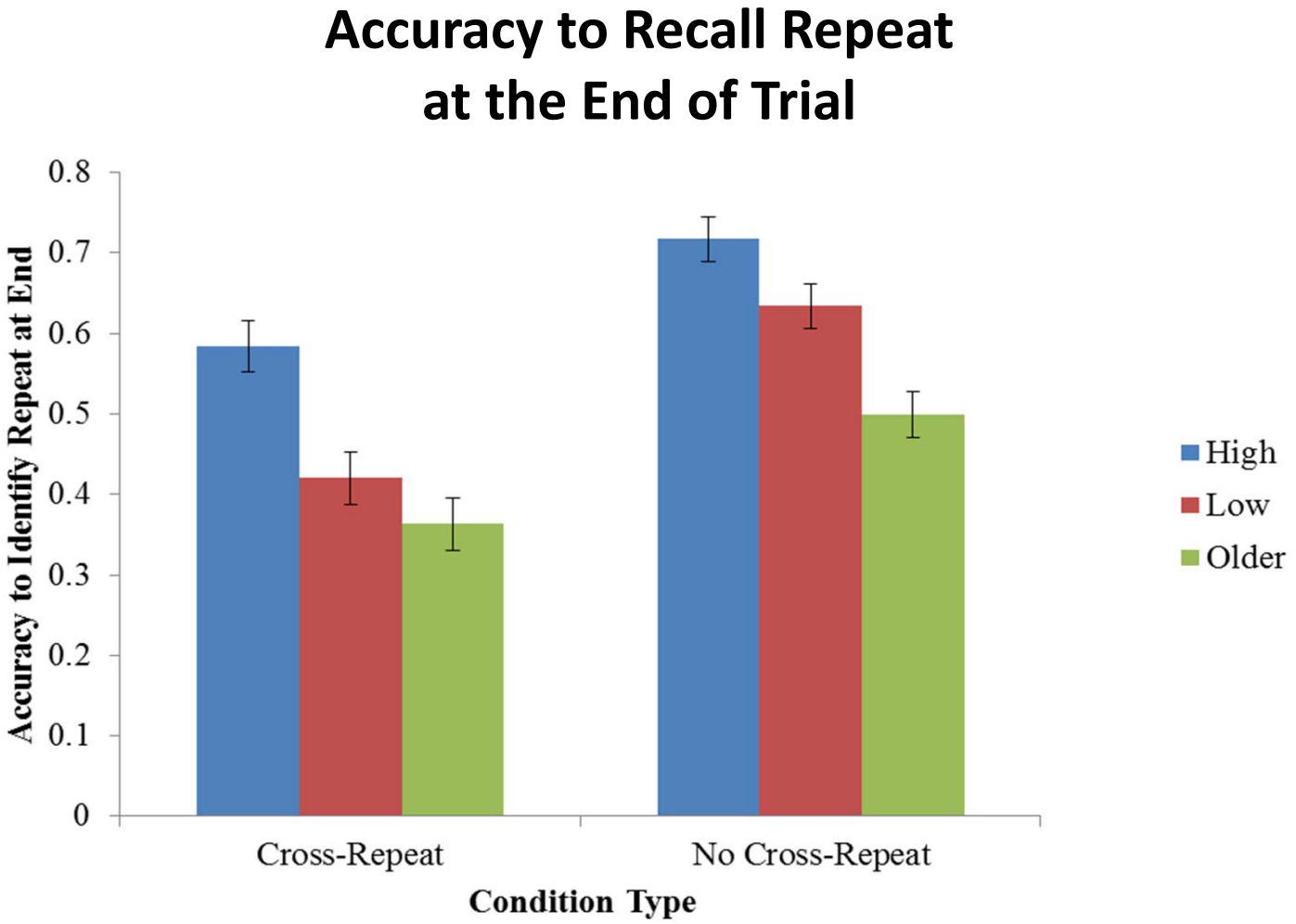
- Participants
  - N = 59 Younger adults (18-22 yrs old)
    - Median split by Automated Operation Span task
    - N = 30 High WMC
    - N = 29 Low WMC
  - N = 23 Older adults (OA) (60-75 yrs old)
- Task
  - Repetition-detection task
    - IV: No cross-repeat vs. cross repeat condition
    - DV: Accuracy and PT

Accuracy Types

Identify Repeat **During** Trial

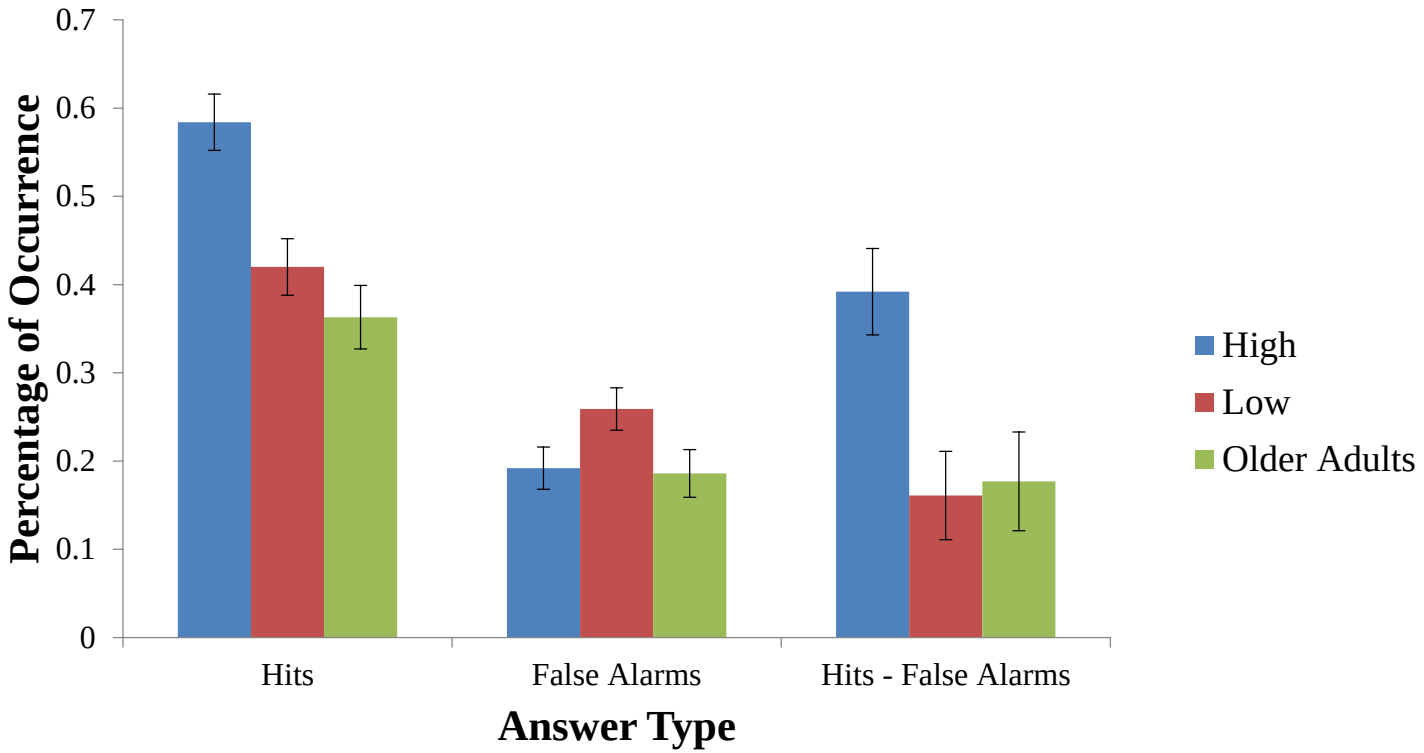
Accuracy to Recall Repeat at the **End**	**Yes**	**No**
Accurate	Yes and accurate at the end	No and accurate at the end
Inaccurate	Yes and inaccurate at the end	No and inaccurate at the end

Results

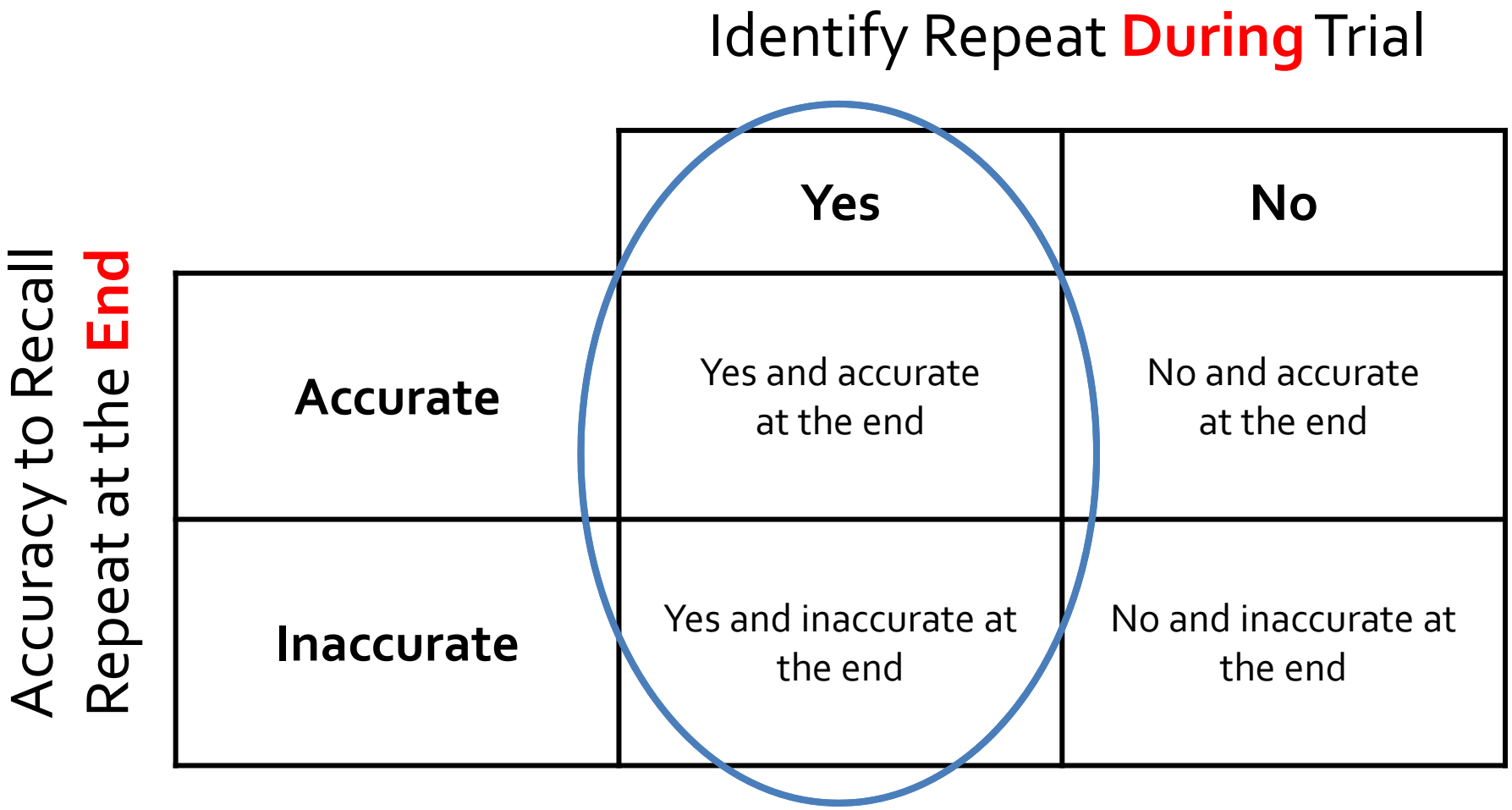

Accuracy to Recall Repeat
at the End of Trial
Accuracy to Identify Repeat at End
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Cross-Repeat
No Cross-Repeat
Condition Type
High
Low
Older

Results

False Alarm Rate at the End of Trial (only Cross-Repeat condition)

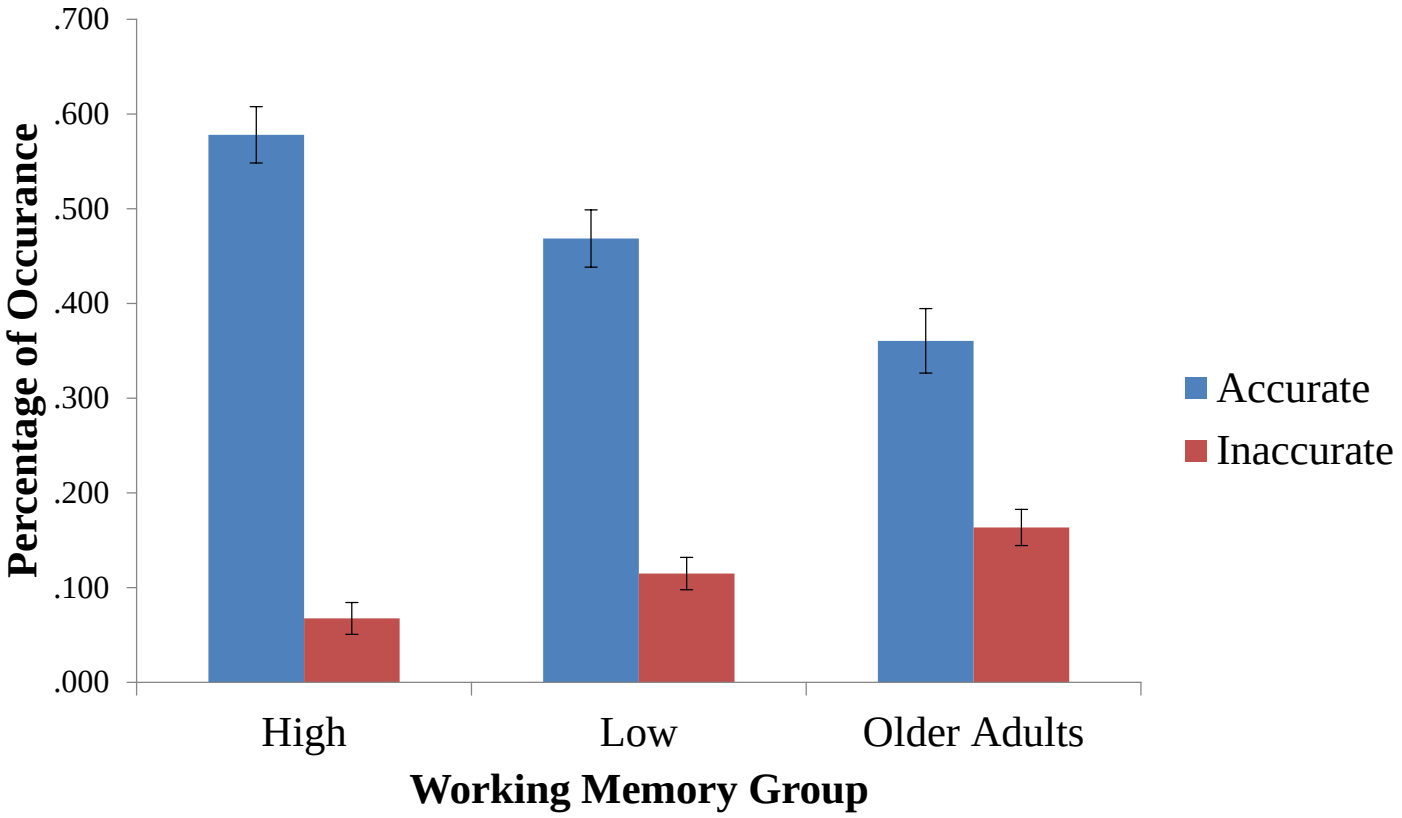


Accuracy Types

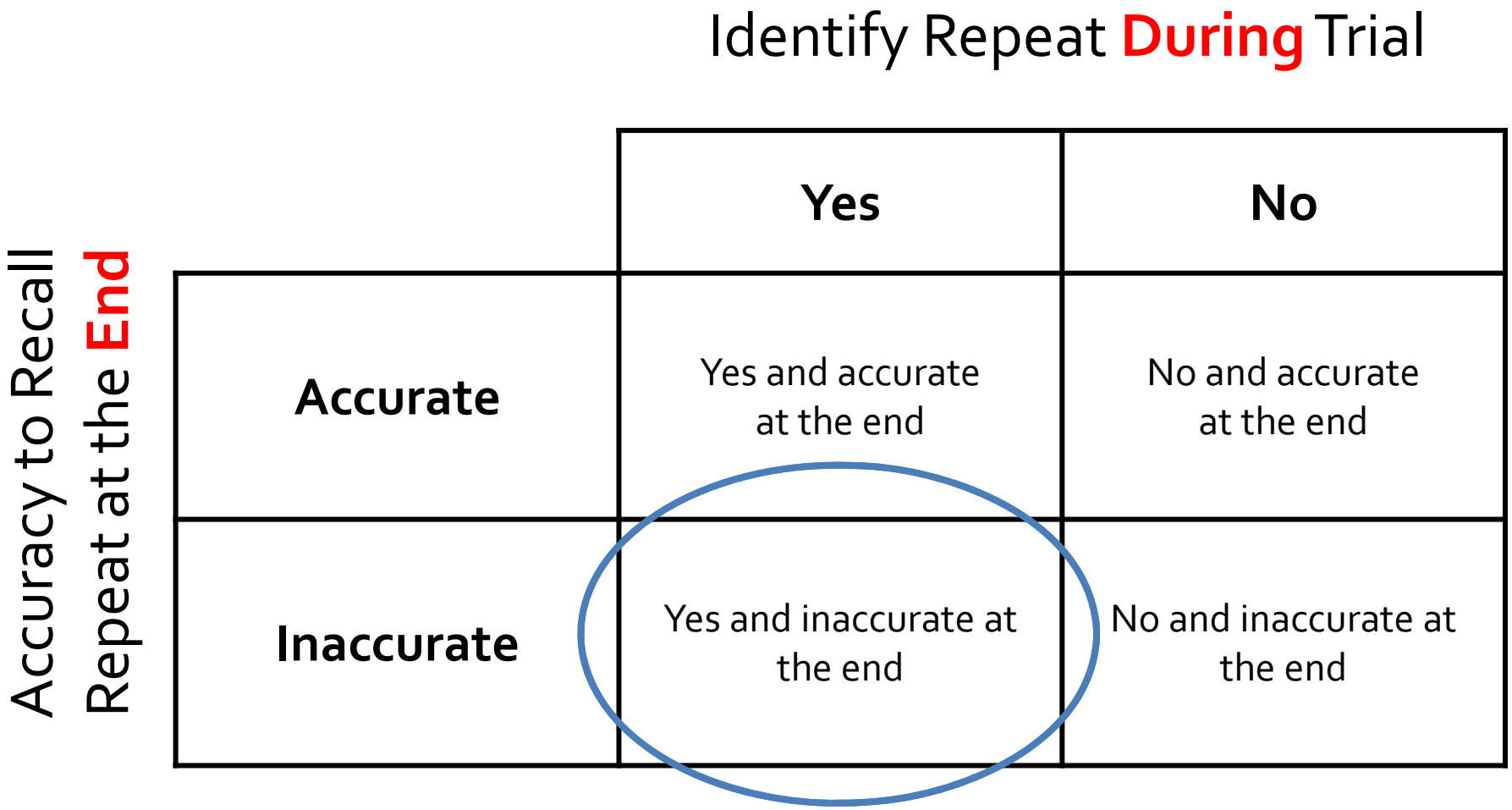


Results

Accuracy to Recall Repeat at the End When Repeat Correctly Identified ("Yes" to repeat) During Trial

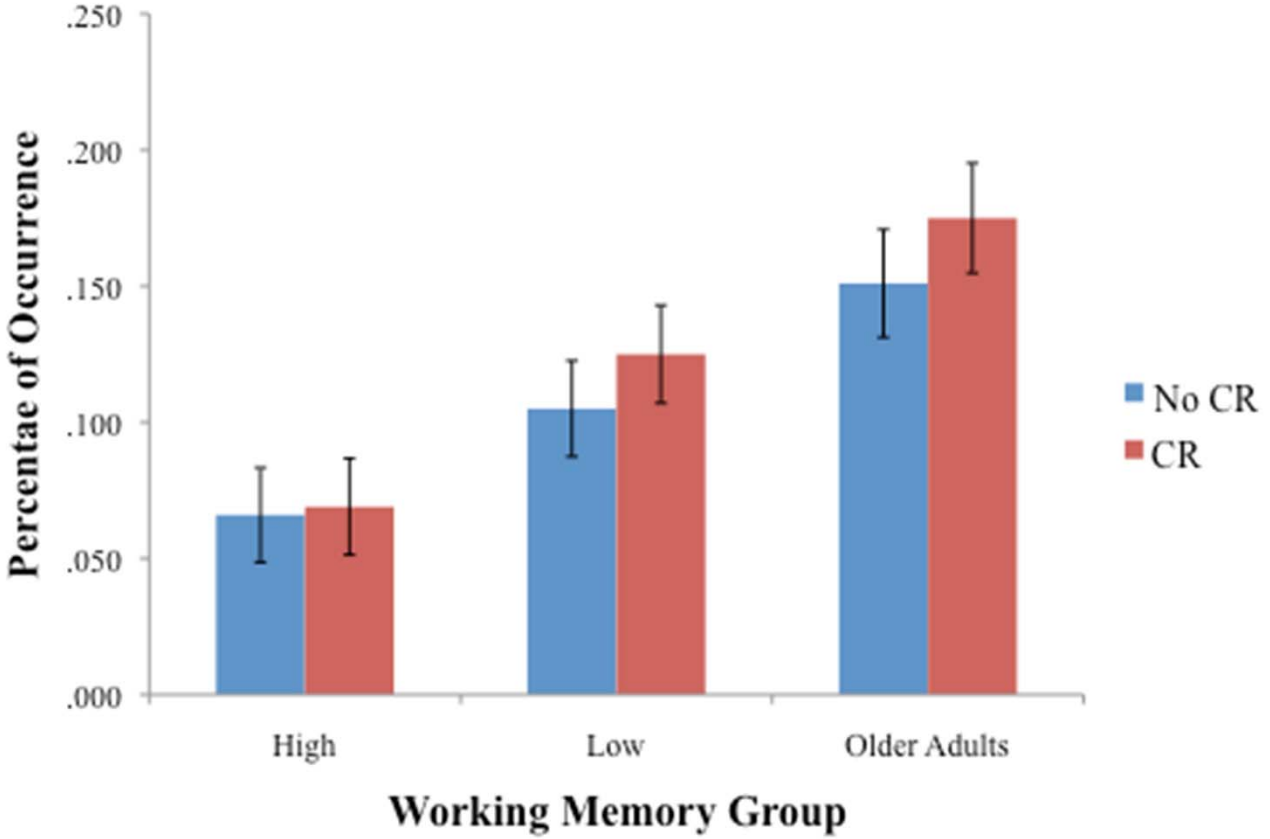


Accuracy Types



Results

Correctly Identified During Trial and Inaccurate Recall at the End of Trial



Accuracy Types

Only Cross-repeat condition

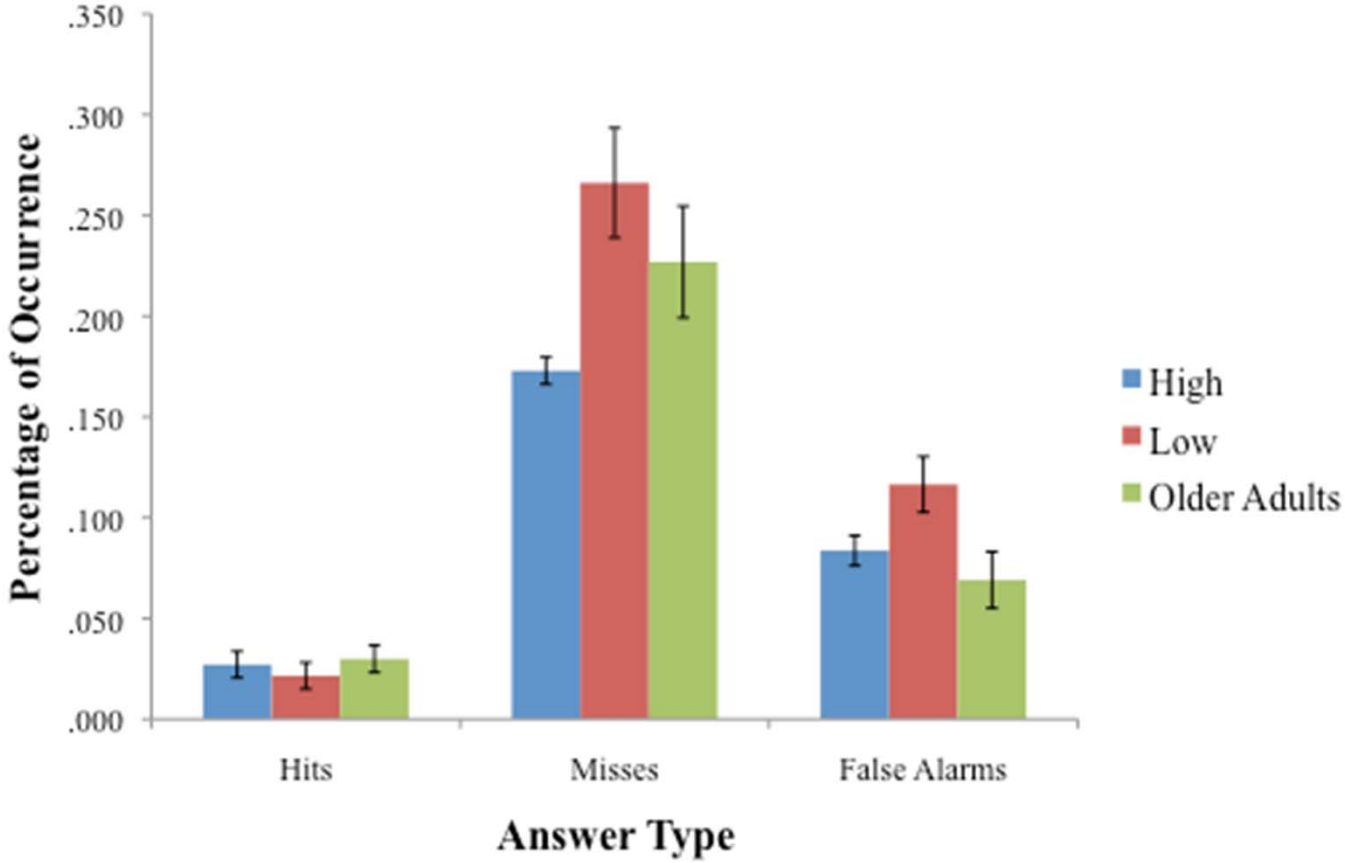
Cross-Repeat (CR)

Identify Repeat **During** Trial

Accuracy to Recall Repeat at the **End**	**Yes**	**No**
Accurate (Hit)	Yes to CR and accurate at the end	No to CR and accurate at the end
Inaccurate (Miss)	Yes to CR and inaccurate at the end	No to CR and inaccurate at the end
False alarm (FA)	Yes to CR and identify cross-repeat (FA) at the end	No to CR and identify CR at end

Results

Accuracy at the End
When Cross-Repeat Identified During Trial



Conclusions

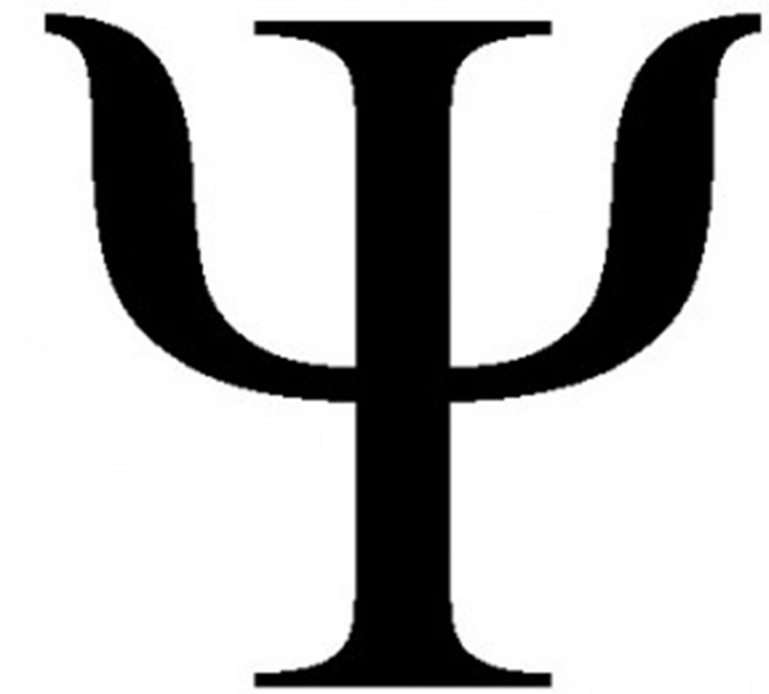
- Interference from cross-repeat
  - Binding on cross-repeat trials more difficult
    - Familiarity of cross-repeat
  - Mixed findings by WMC group
    - Low WMC and older adults false alarm rate higher
    - No interactions of condition and WMC group
- Interference from intervening items
  - Larger effect on lower WMC groups
- Working memory capacity differences are due to the ability to hold items in the face of interference

Future Directions

- Examine if the difference is due to interference of intervening items or decay
  - Decay = Loss due to time
  - Problem: decay vs. interference is difficult to separate
- Test more older adults and separate into high and low working memory capacity groups

Acknowledgements

- We would like to thank Dr. Bopp and the Psychology Department



Questions