Age-related deficits in working memory: The role of additional cues in content to context binding

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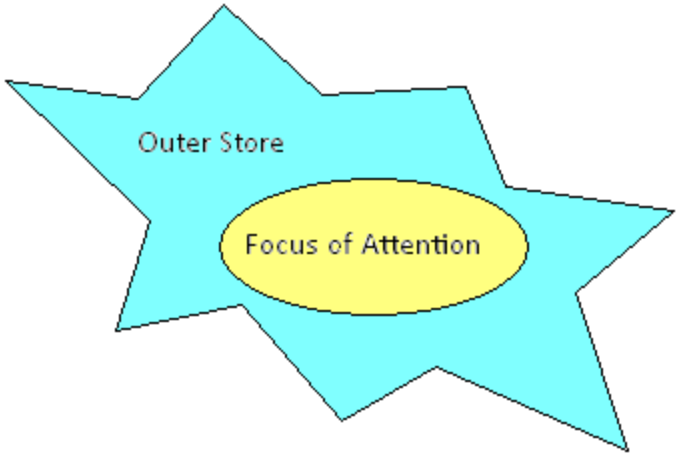
Working Memory

- Storage with concurrent processing
- 2 components:
  - Focus of Attention – what you are paying attention to
  - Outer Store – not attended to but easily accessible
- Focus switching – shifting information in between focus of attention and outer store

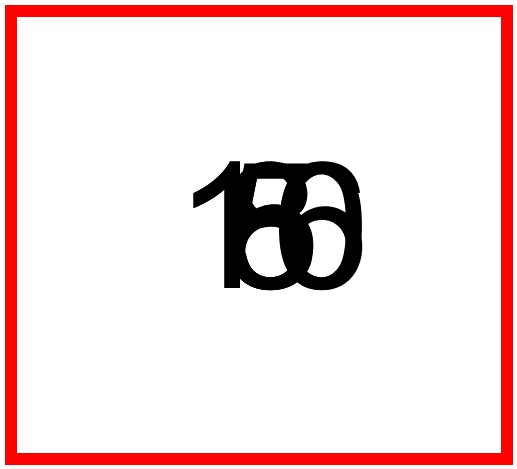


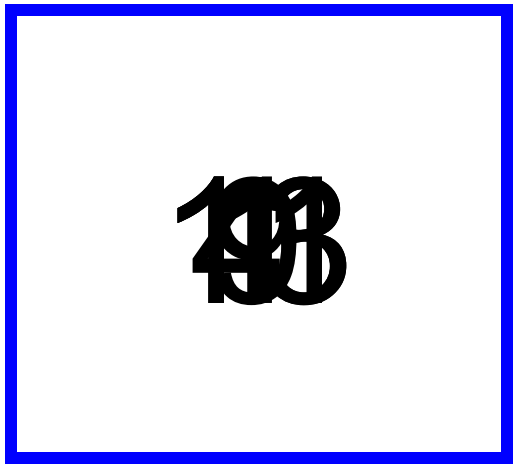
Working Memory

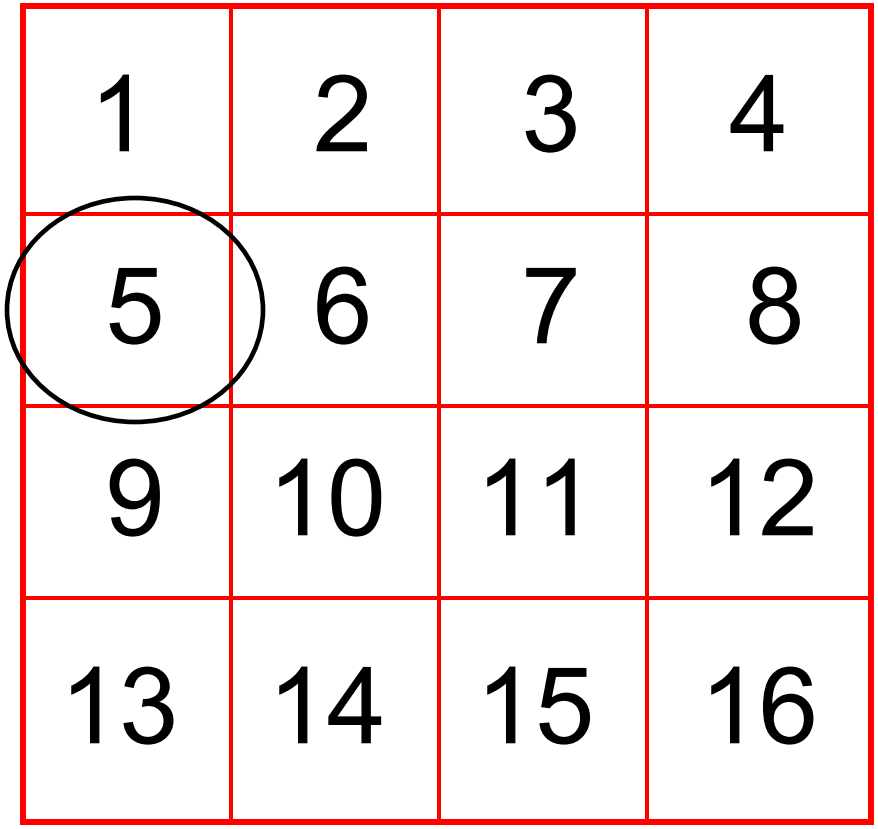
- Storage with concurrent processing
- 2 components:
  - Focus of Attention – what you are paying attention to
  - Outer Store – not attended to but easily accessible
- Focus switching – shifting information in between focus of attention and outer store
- Working memory diminishes with age – WHY?

Repetition Detection Task

- View a series of numbers
- One number is repeated in the series
- Identify repeated number
- May view 1 series, 2 series, or 3 series simultaneously







Repeat = 5

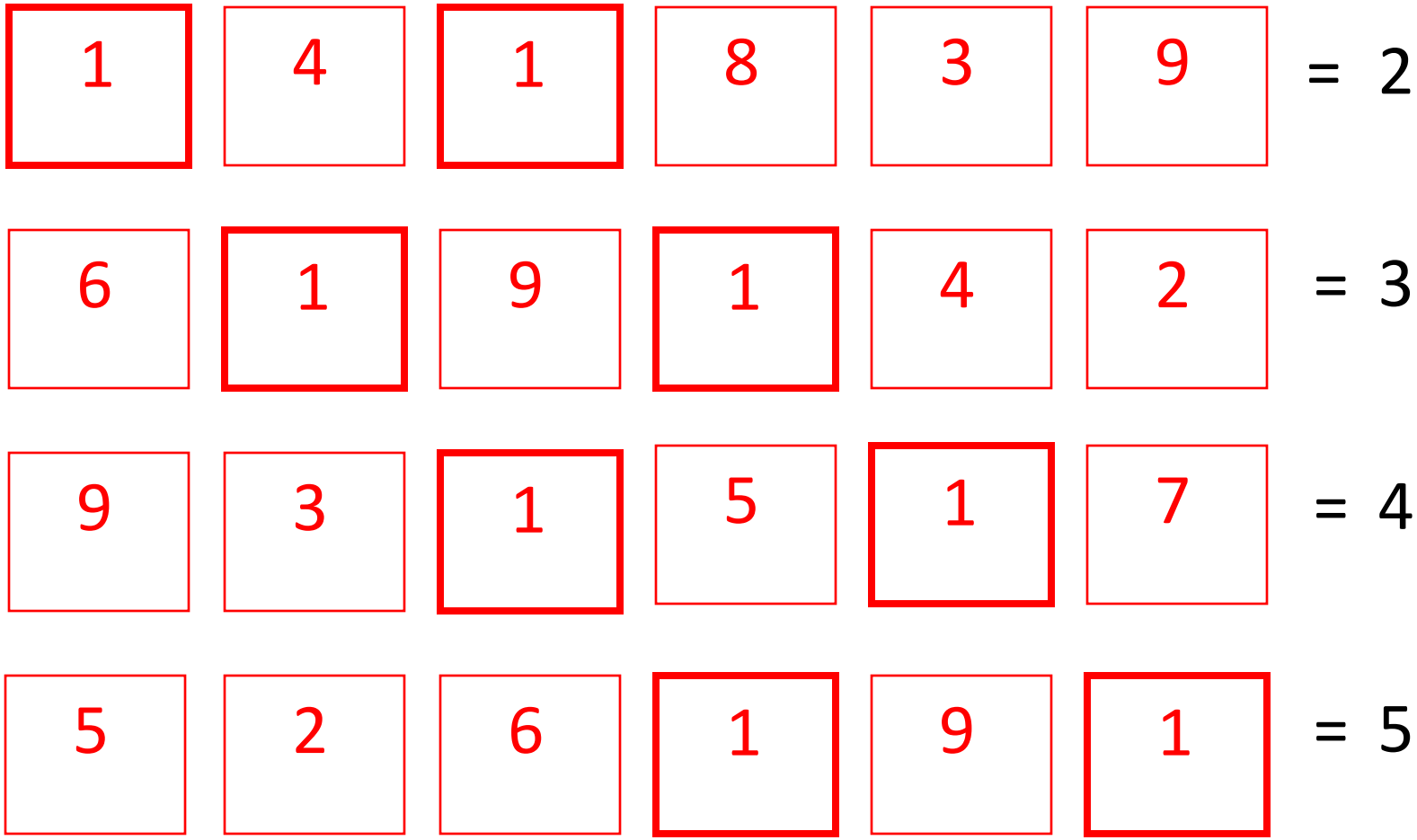
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Repeat = 13

Method

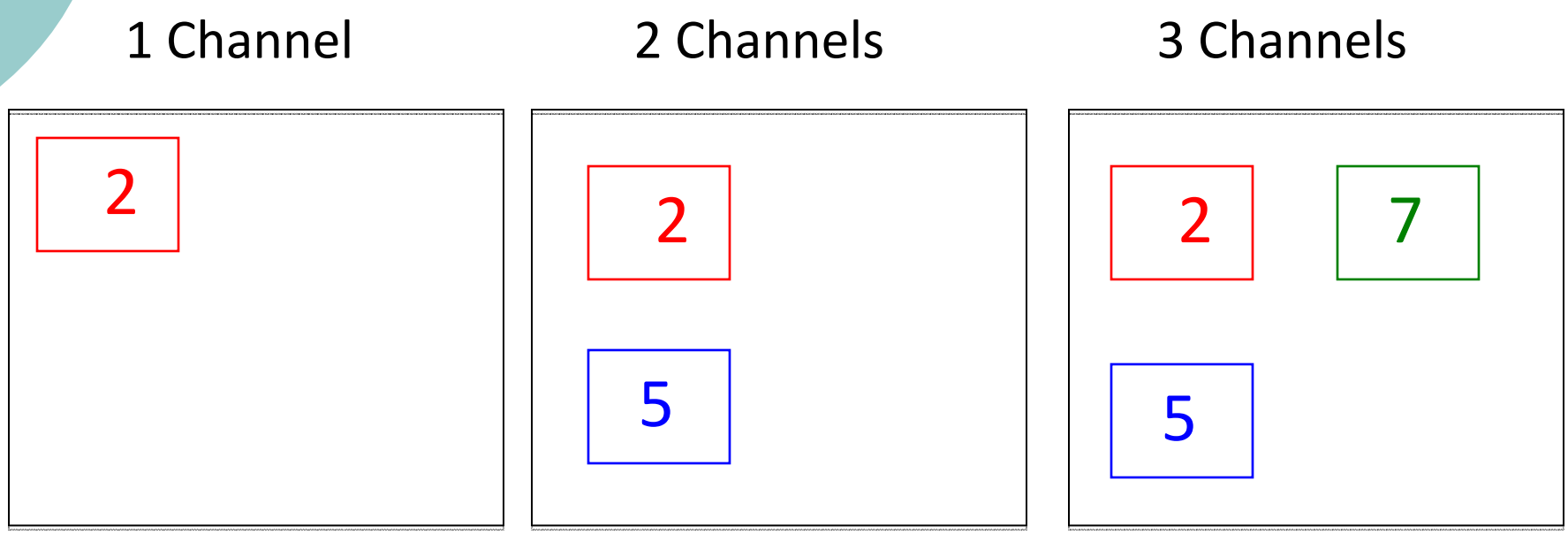
- 19 younger adults and 16 older adults
- Counterbalanced
- Variables:
  - Age
  - Task version
  - Memory load
  - Series
  - Channel

Memory Load



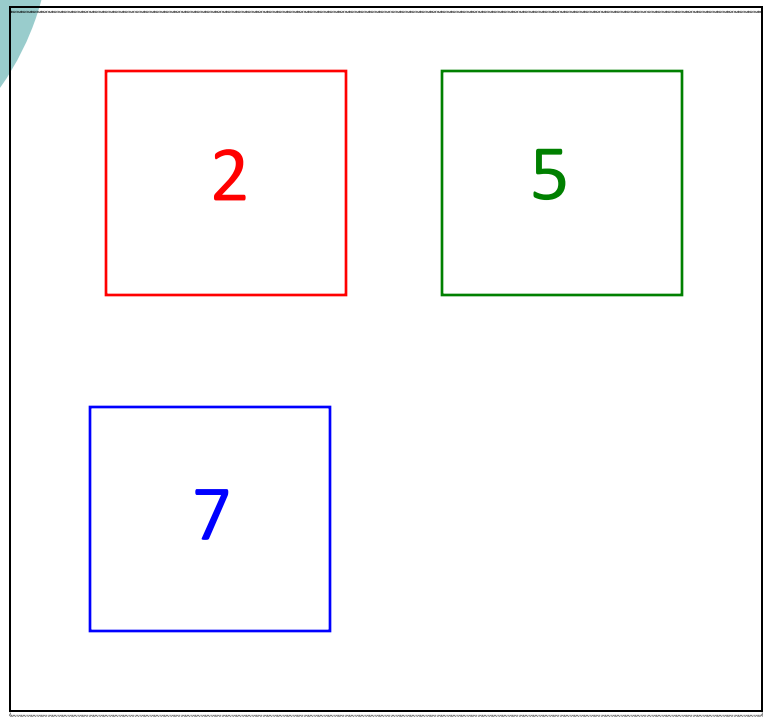
Lag always equals 1

Channel and Series

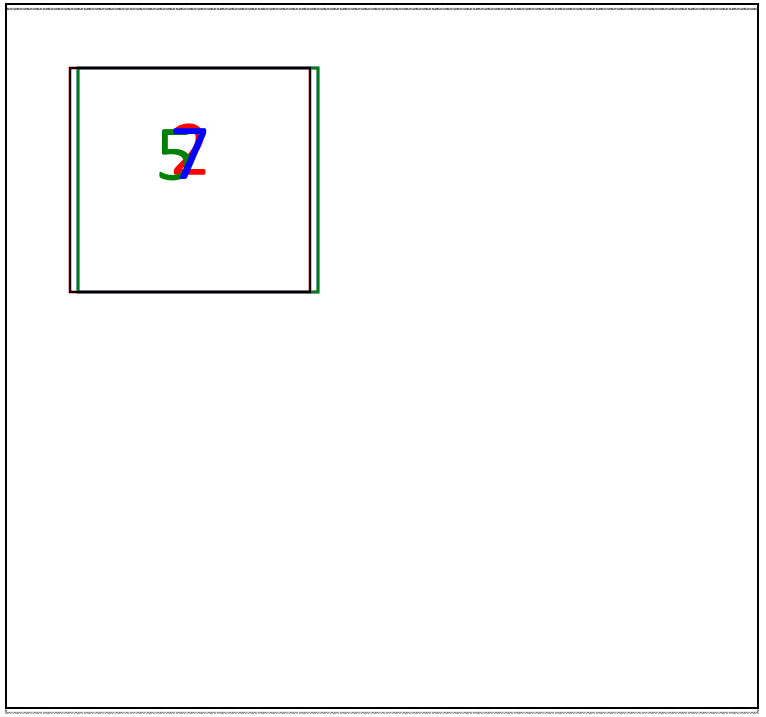


Task Version

Color with location



Color without location



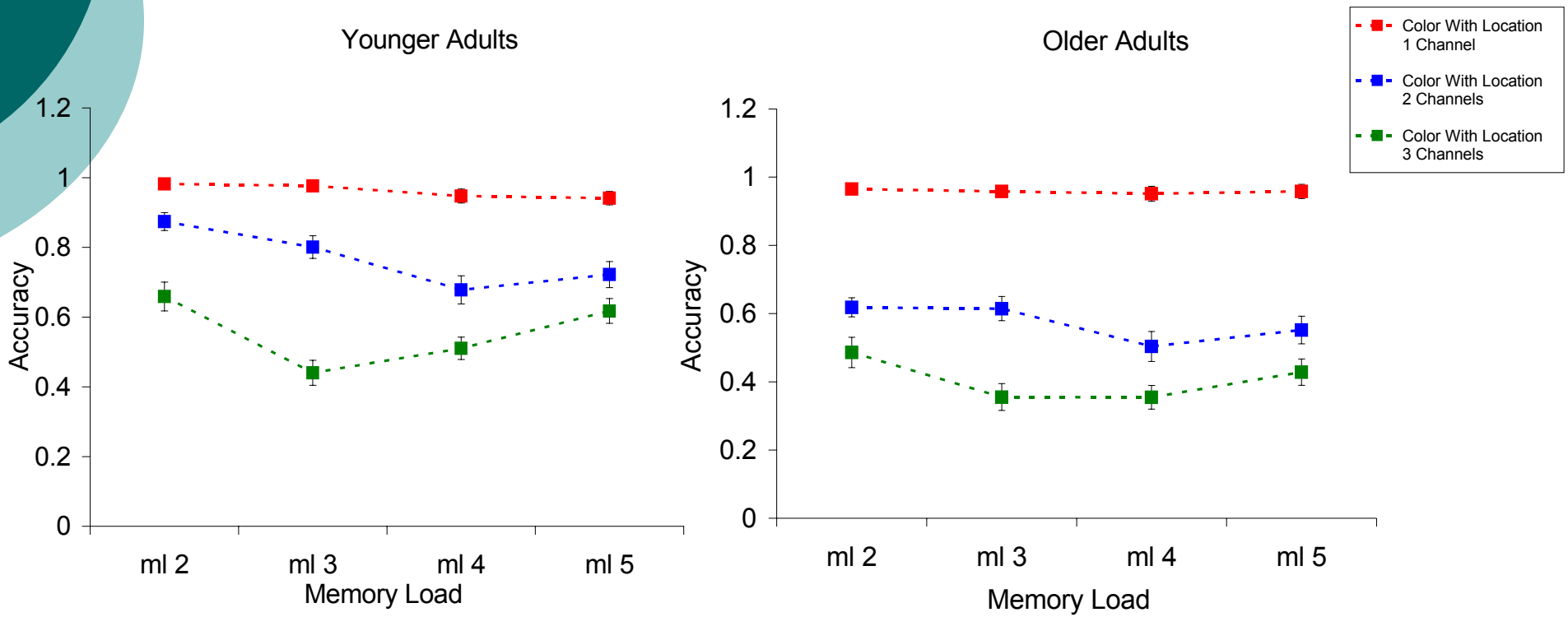
Content to Context Binding

- Bind content to context while learning
- Possible source of deficits in older adults
- Do additional cues affect older adults' ability to bind information that they learned to the context in which it was learned?

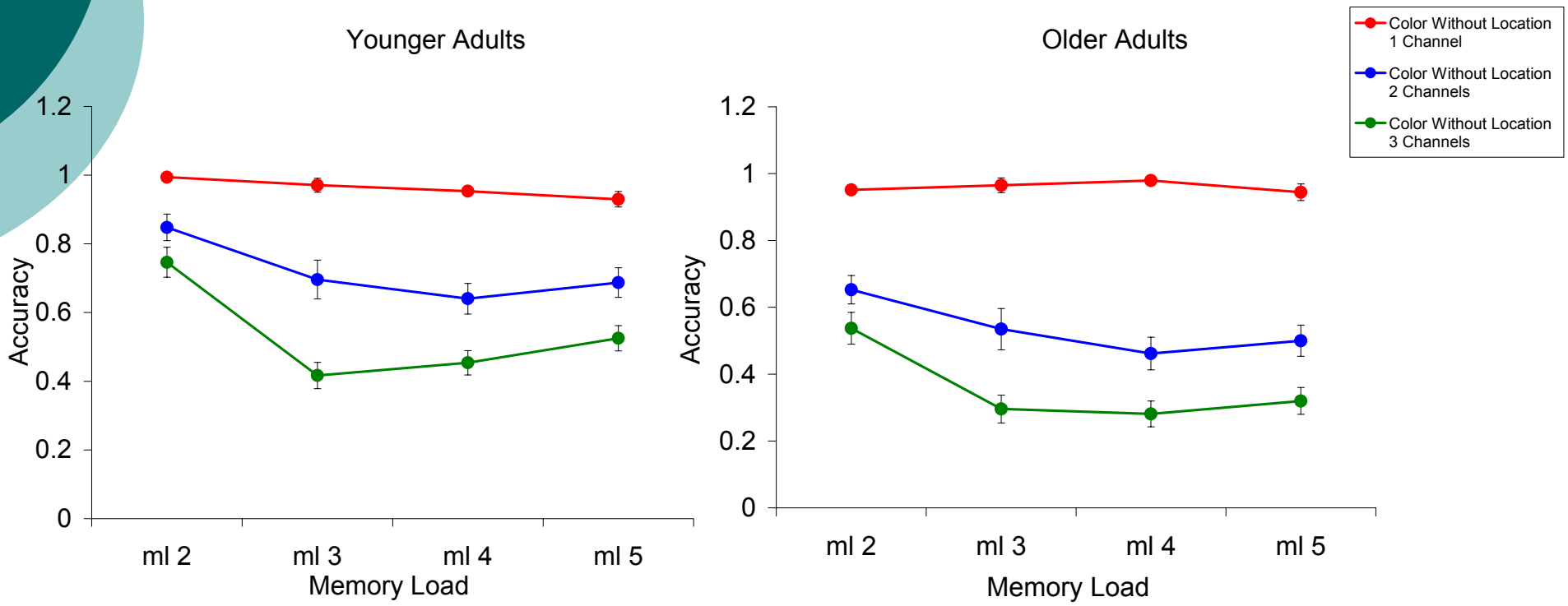
Dependent Variables

- Accuracy
  - Overall: average of accuracies across all series
  - Within-series: accuracy for each individual series
- Processing time (PT)
  - Time to view each stimulus
  - Before PT: average PT for each stimulus before repeat presented on accurate trials

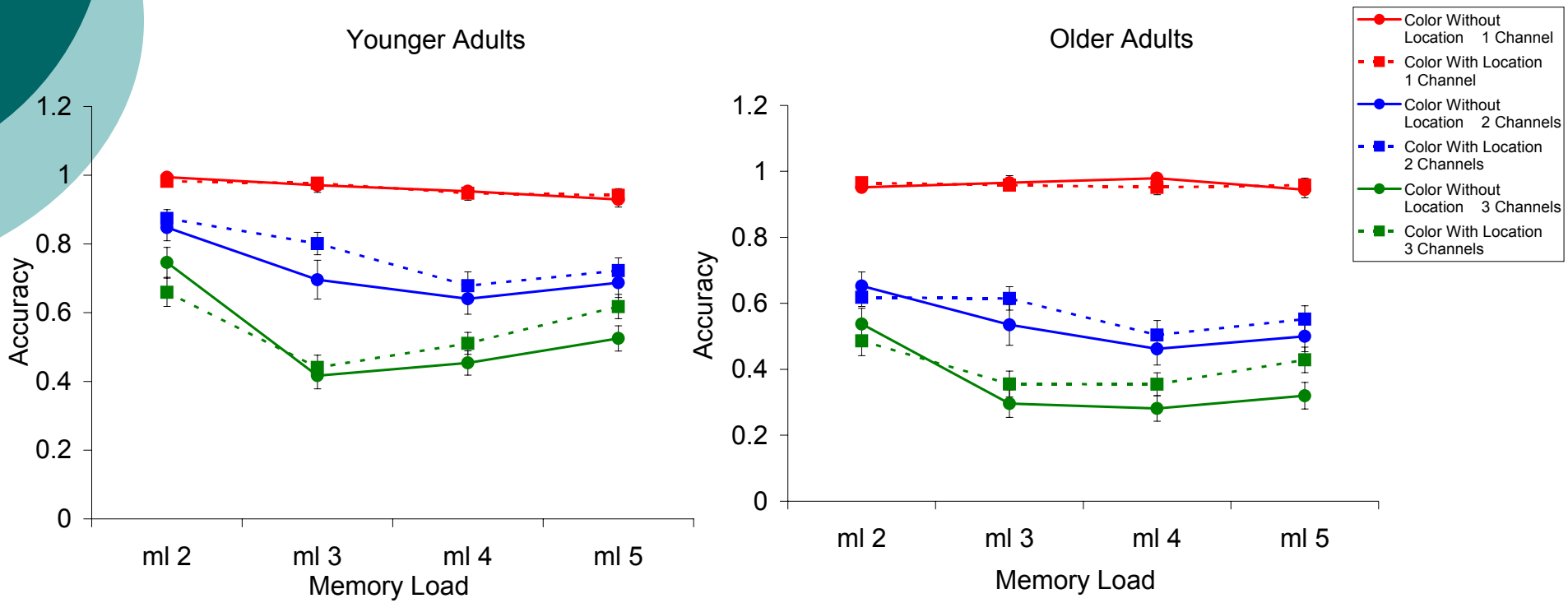
Accuracy – Color With Location



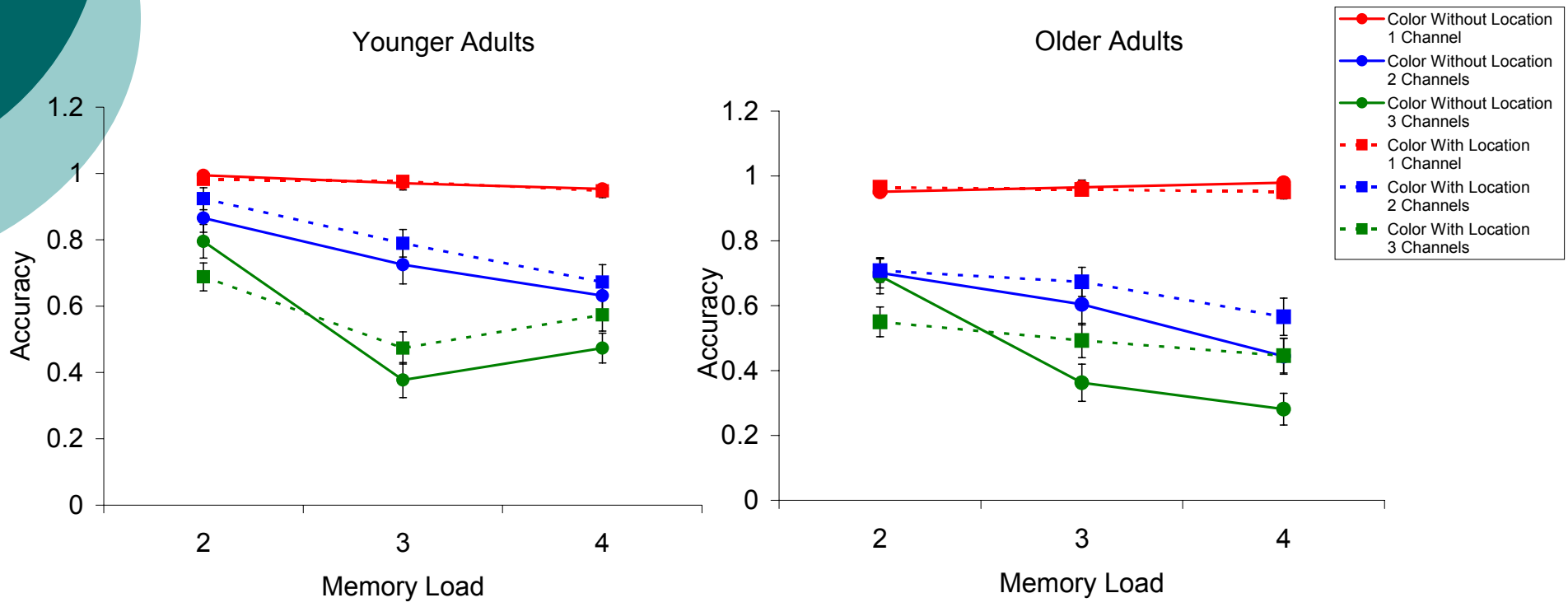
Accuracy – Color Without Location



Accuracy – Both Task Versions



Red Series Only – Both Task Versions



Conclusions

- Main Effects of Age, Memory Load, Channel
- No age-related differences were found between task versions
  - Additional cues do not differentially aid older adults
  - Age-related deficits are not a binding problem
- Age differences in WM due to focus switching problem instead?
  - Switching attention between multiple channels leads to a significant drop in accuracy for older adults

Acknowledgements

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