

# Age-Related Effects in a Novel Dual-Task Stroop Paradigm

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## Background

General-purpose cognitive abilities tend to decline with age

- Older adults demonstrate exaggerated Stroop effects relative to younger adults [1-2]
- Multitasking abilities also decline over the lifespan [3-5]

Canonical measures of cognitive control (like Stroop) are subject to strategies that may challenge the validity of such tasks

- Subjects easily 'game' the Stroop task by circumventing the written material altogether

We created a modified Stroop task that introduces a secondary task to test:

- (1) The degree of overlap between age-related deficits in cognitive control and dual-tasking
- (2) The role of a secondary task that shifts subjects' attention to relevant (ink color) vs. irrelevant information (word)

## Methods

24 Older adults (61-81 years) and 34 Younger adults (18-24 years) completed 3 versions of the Stroop task:

### Single Task Stroop

GREEN  
XXX  
BLUE  
GREEN  
XXXX  
XXXXX  
RED

### Dual Task Stroop (Count Ink)

GREEN  
XXX  
BLUE  
GREEN  
XXXX  
XXX  
RED

Count blue? (3)

### Dual Task Stroop (Count Word)

GREEN  
XXX  
BLUE  
GREEN  
XXXX  
XXXXX  
RED

Count BLUE? (1)

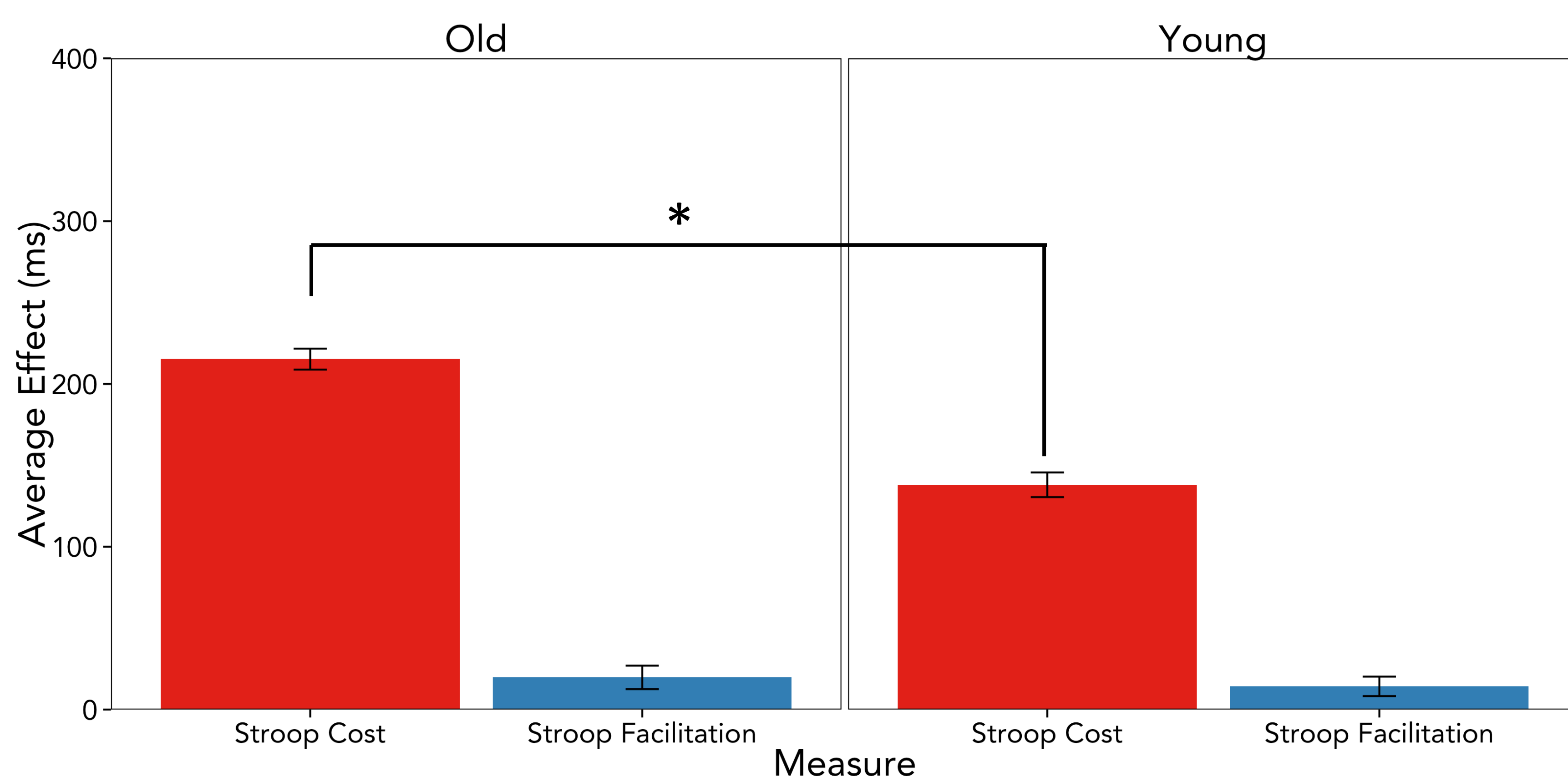
## Cognitive Control Effects

**Stroop Cost:** Incongruent RTs – Neutral RTs

- Older adults > Younger adults

**Stroop Facilitation:** Neutral RTs – Congruent RTs

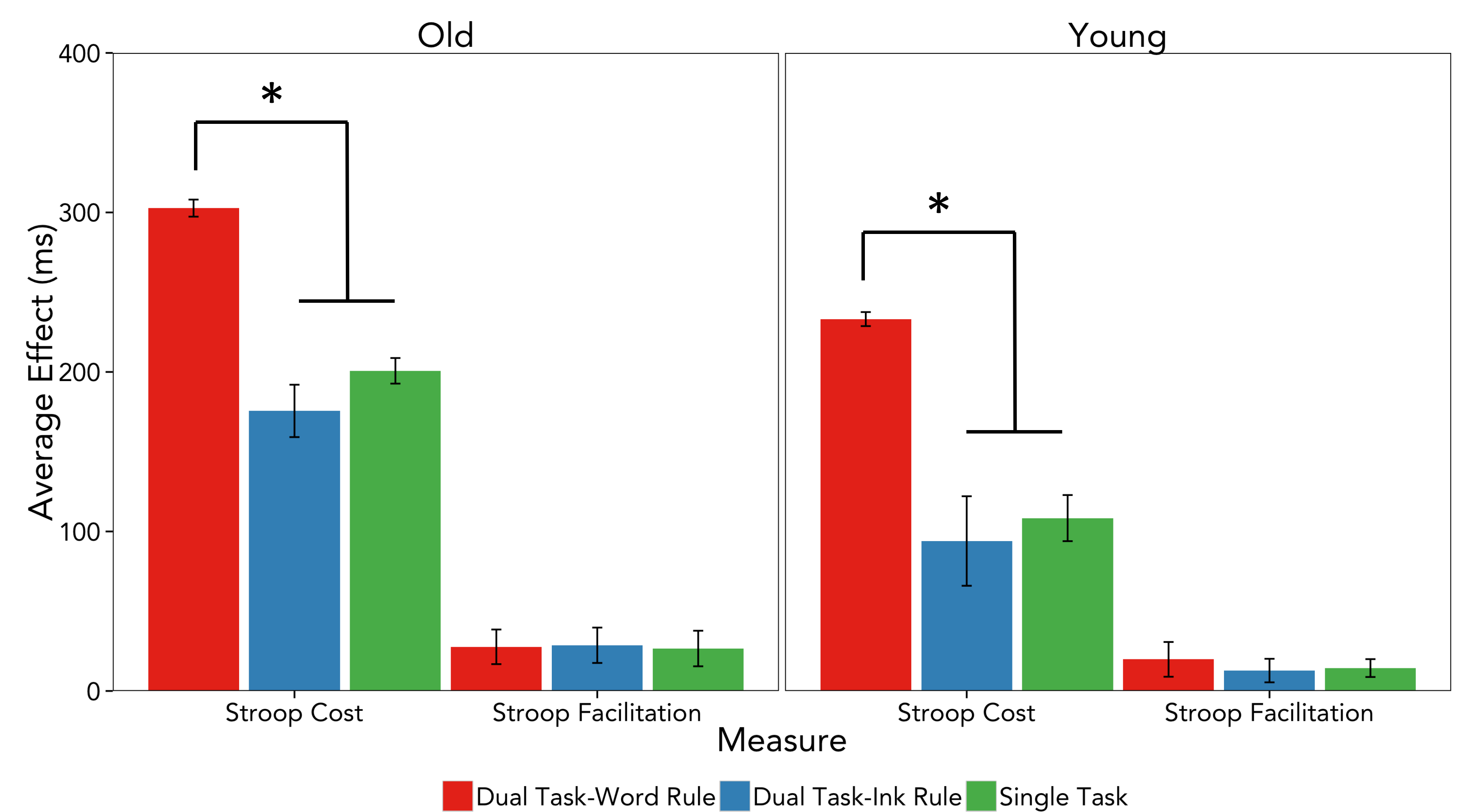
- Older adults = Younger adults



## Dual-Tasking Effects

Dual Task (Count Word) > (Dual Task (Count Ink) = Single Task)

Older adults = Younger adults, regardless of dual-tasking demand



## Conclusions

- (1) Age-related effects persist only for high cognitive control demands (Stroop costs), regardless of dual-tasking demands.
- (2) The nature of the secondary task influences Stroop performance, such that a task that is consistent with the goal of Stroop (count ink) leads to faster response times compared to a task that is inconsistent (count color), regardless of age.
- (3) We offer a novel measure of cognitive control that has been validated across age groups.

## Future Directions

- (1) Can modified Stroop performance help us to understand the general-purpose mechanisms involved in real-time situations of driving under distraction?
- (2) Verify validity of modified Stroop task measures using structural equation modeling



## References & Acknowledgments

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