Assessing the Impact of “Brain Training” on Driving Performance, Visual Behavior, and Neuropsychological Measures

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Driving Assessment 2013
June 18

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Age-Related Decline of Function

Use It or Lose It

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There’s an App for That

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lumosity
reclaim your brain™

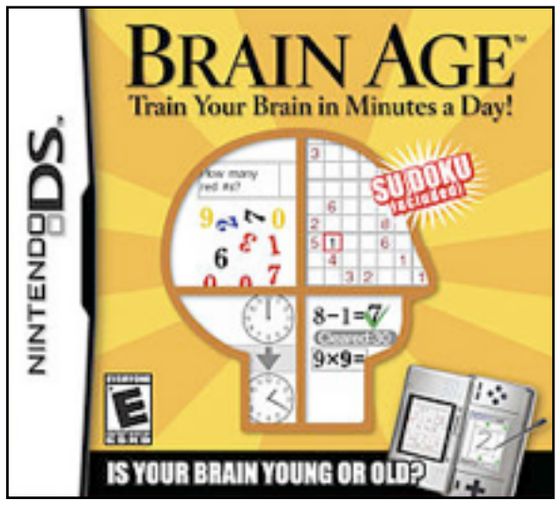
brainHQ
from Posit Science

CogniFit®

ULTIMEYES™

neuroactive Program

LearningRx™
train the brain. get smarter. guaranteed.



mindsparke
think. work. test. better.

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Rationale

- Studies of brain training packages have focused on transfer of learning to neuropsychological metrics. (Smith et al., 2009; Wolinsky et al., 2011)
- Does the use of brain training software lead to quantifiable differences in real-world perception and action?

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Enter *Drivesharp*

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What is *Drivesharp*?

- A suite of tasks designed to improve visual detection.
- Specifically marketed as a way to improve peripheral vision and become a better driver.
- Now part of Posit Science's *BrainHQ* online portal.

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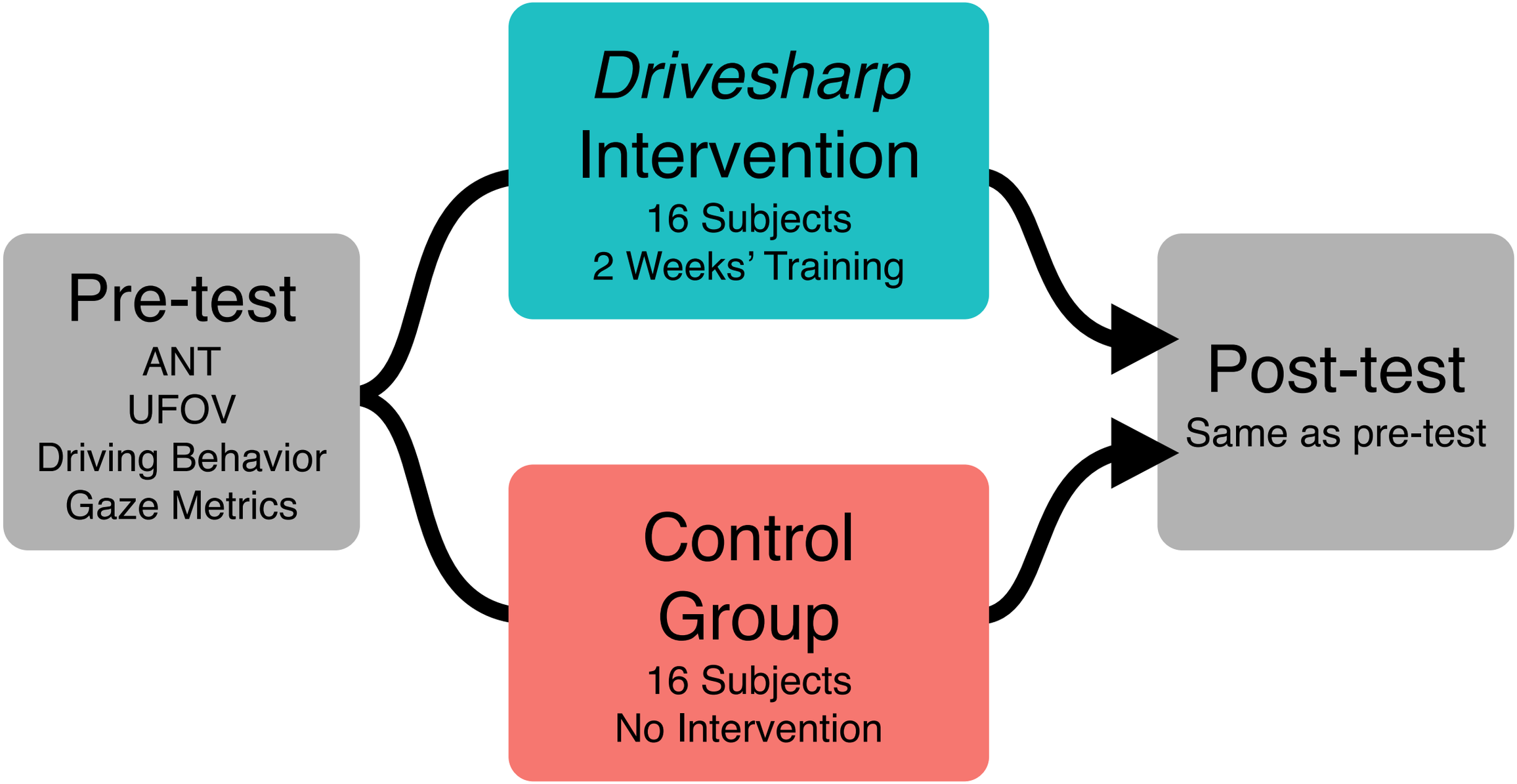
Study Design



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Pre-Test & Post-Test

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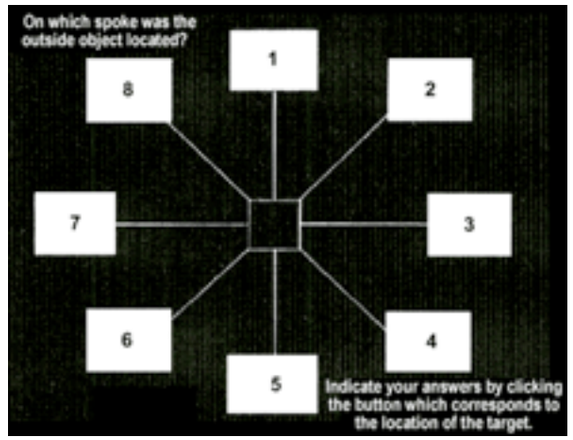
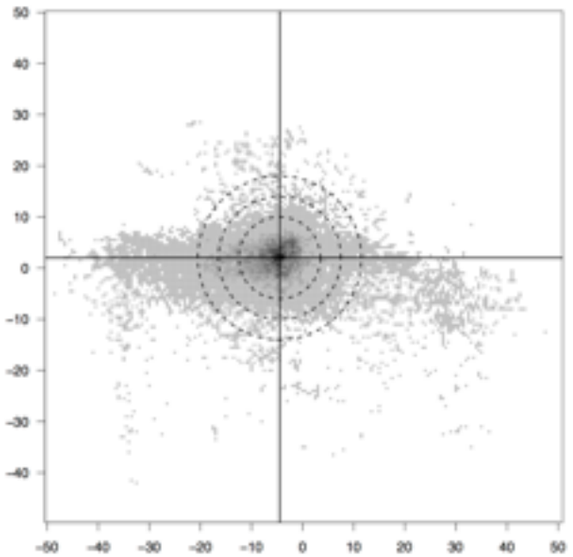
Neuropsychological Testing

- Attention Network Test (ANT)
- Useful Field of View (UFOV)



Gaze Behavior

- Subjects performed a memory task and a visualization task
- Gaze concentration (SD of gaze position) computed before, during, and after task periods.



Driving Behavior

- On-road assessment in an instrumented vehicle
- Mean vehicle velocity
- Micro-accelerations
- Wheel reversal rate

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Cognitive Intervention

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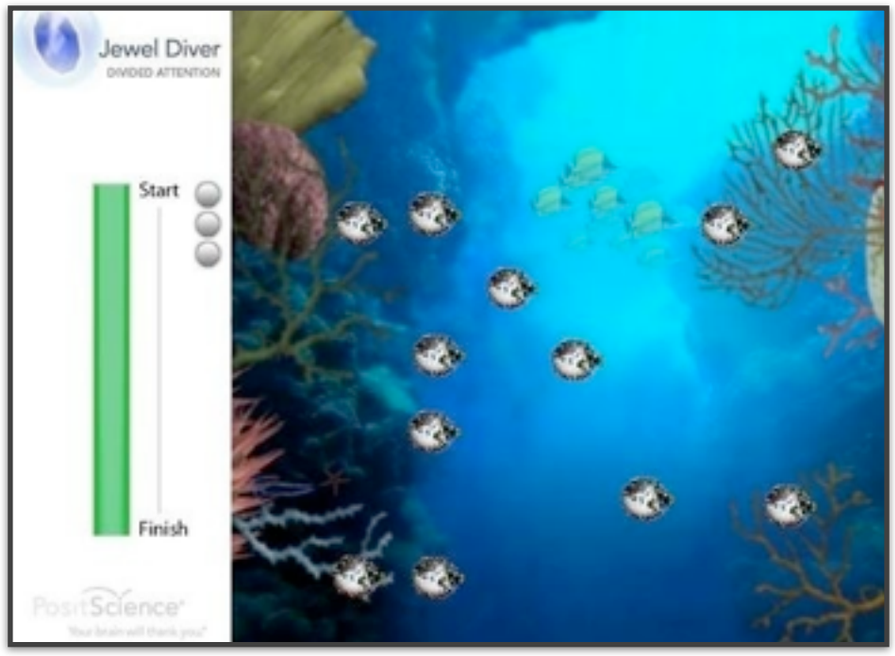
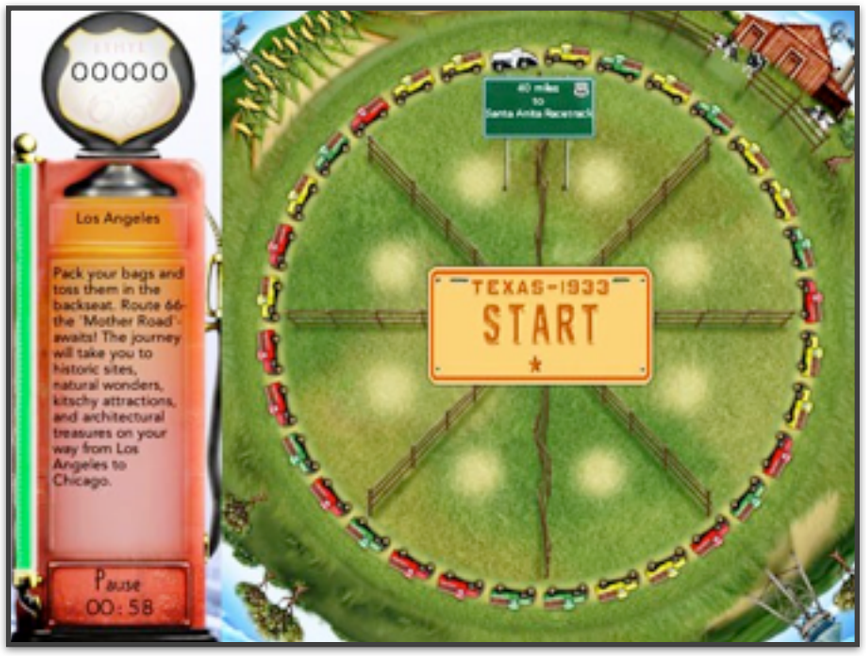
Intervention Group trained for two weeks with *Drivesharp*.

(8 hours of training recommended)



Jewel Diver



Road Tour

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Results: Sample Characteristics

	N	Age (SD)	Training Time, mins (SD)
Intervention	16 (8 male)	66.8 (4.5)	500.8 (72.9)
Control	16 (9 male)	66.3 (5.3)	N/A

10 subjects completed the recommended minimum training time

Subjects spent **39** minutes more on Road Tour compared to Jewel Diver ($p < .01$)

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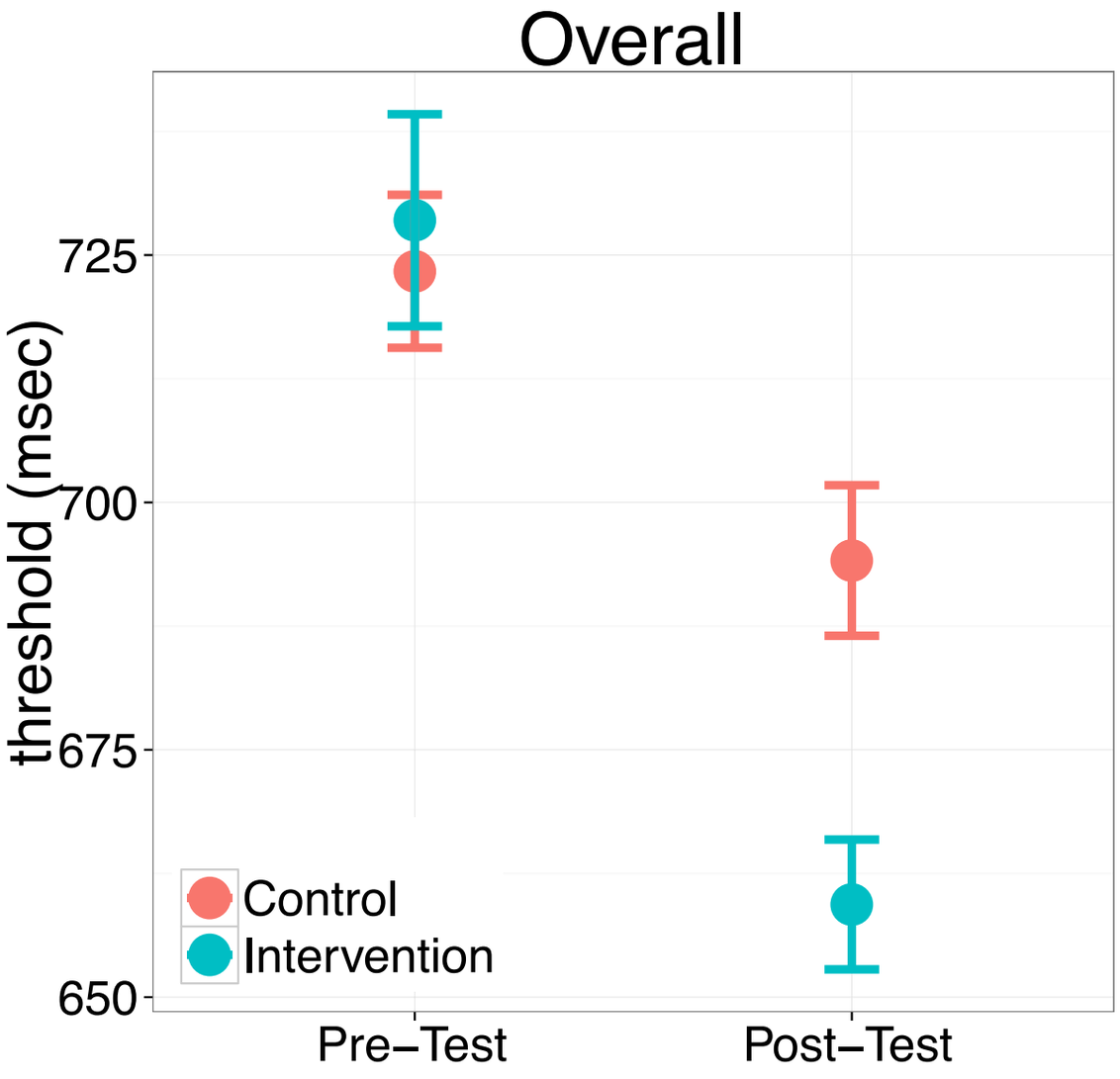
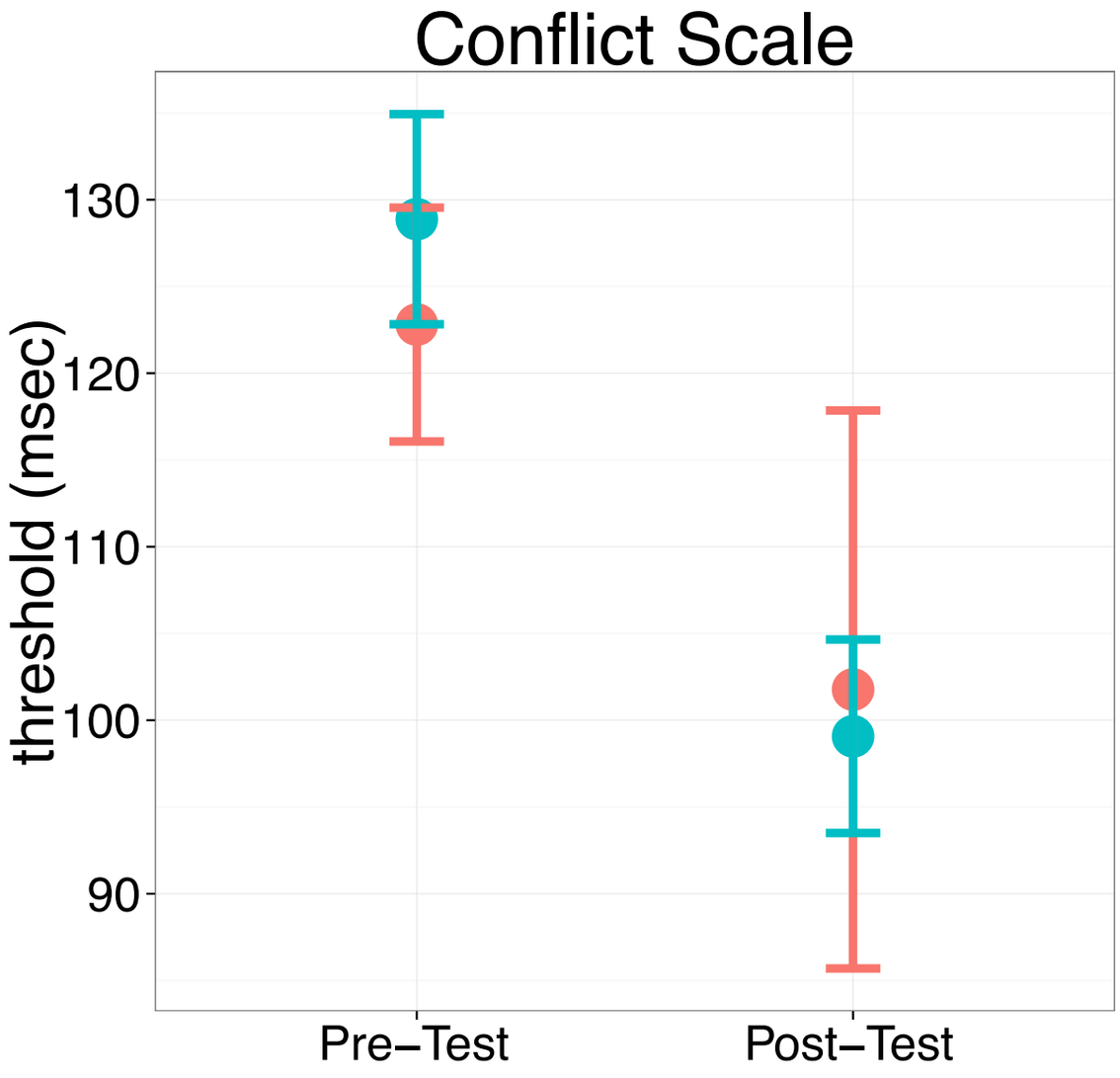
Results: Neuropsychological Measures

ANT Scores





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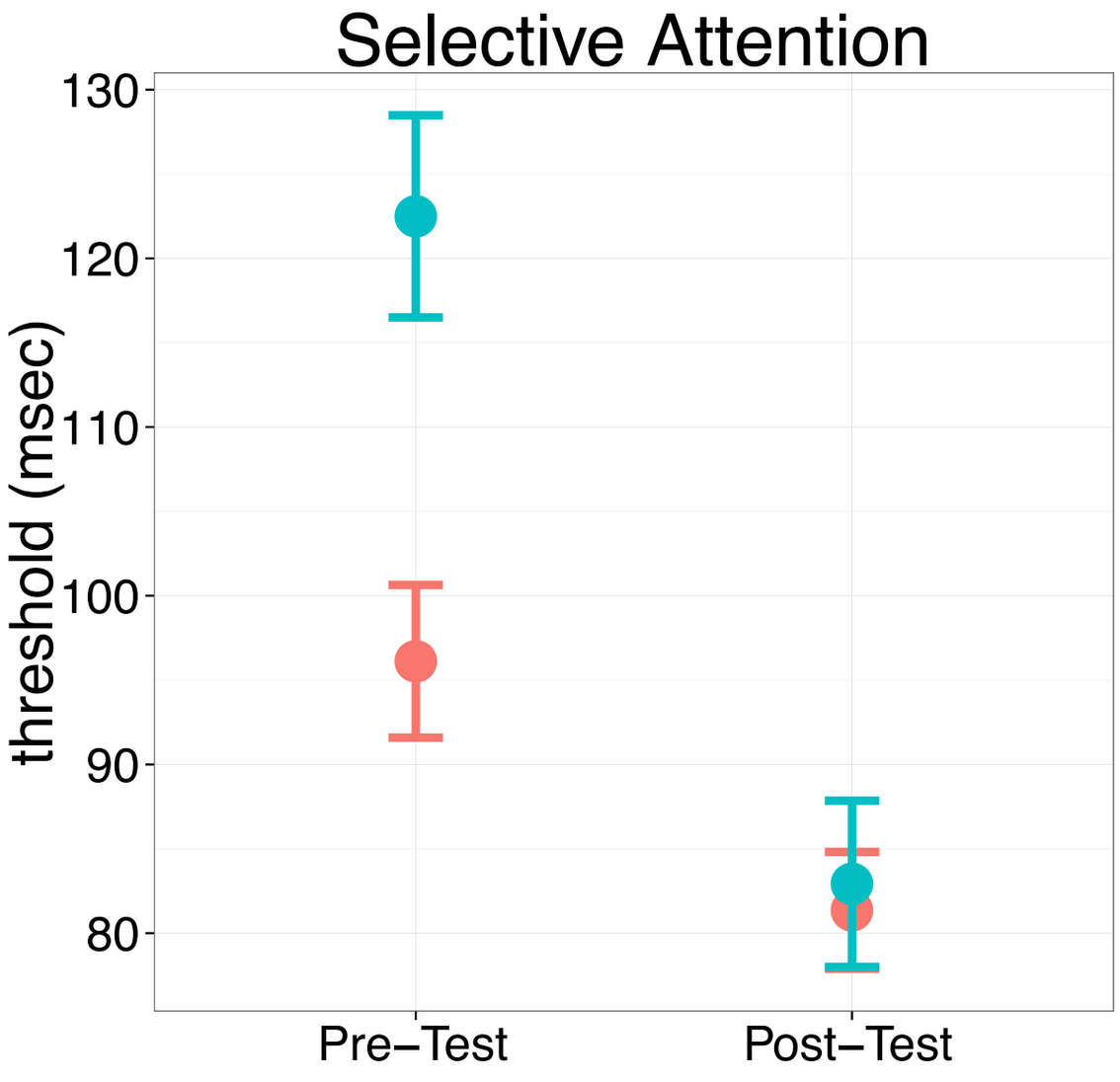
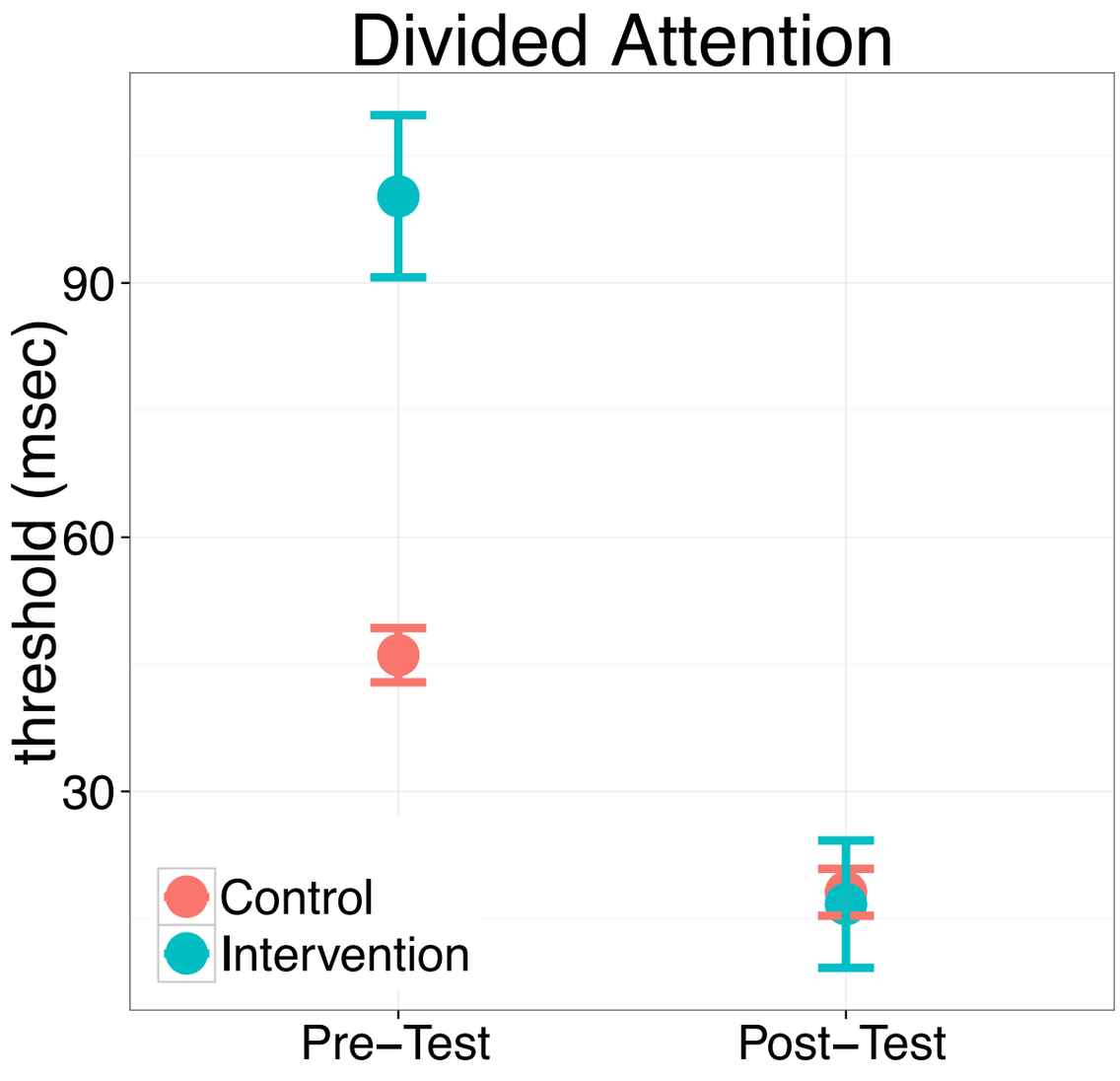
Results: Neuropsychological Measures

UFOV Scores





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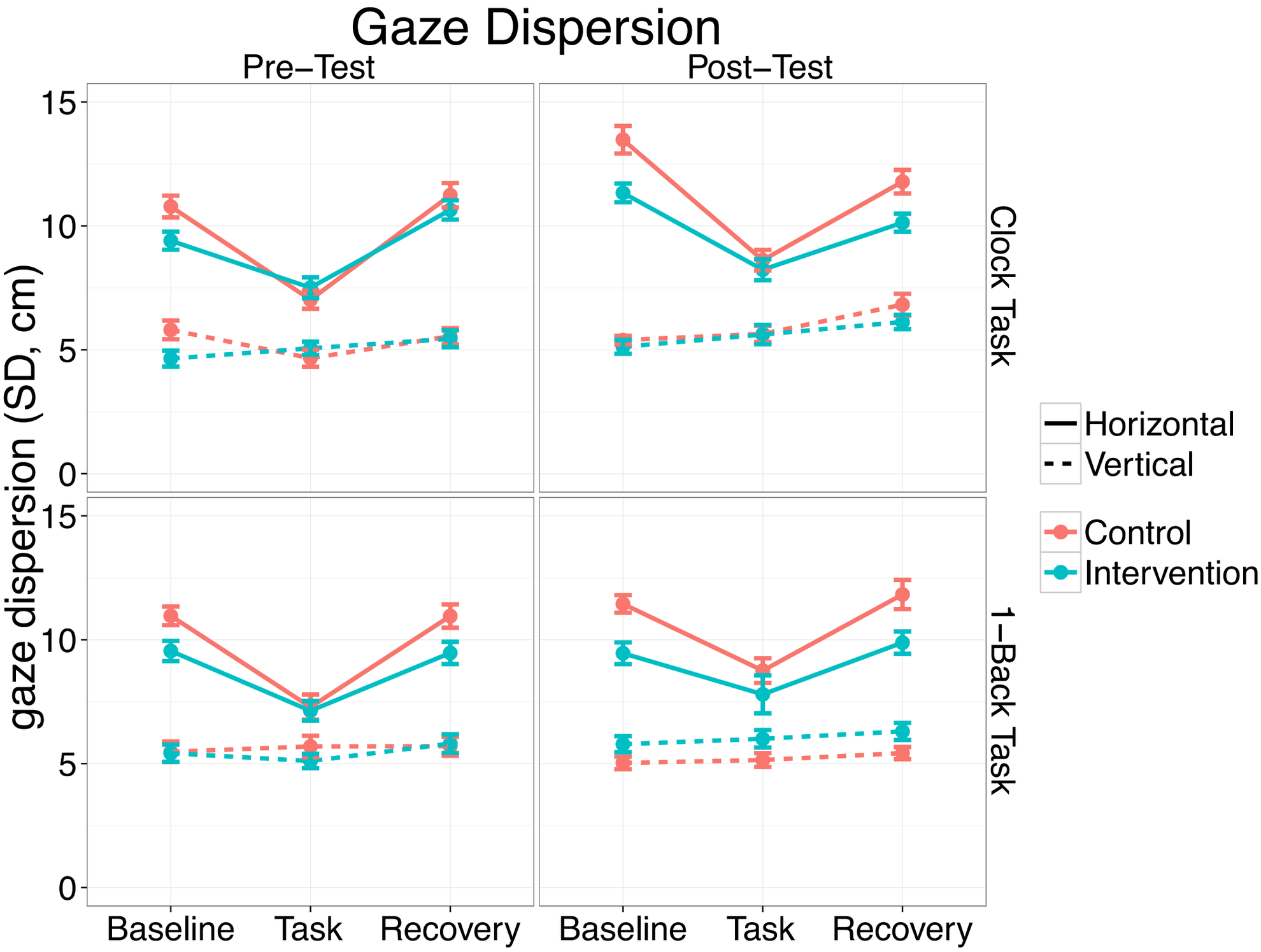
Results: Gaze Behavior



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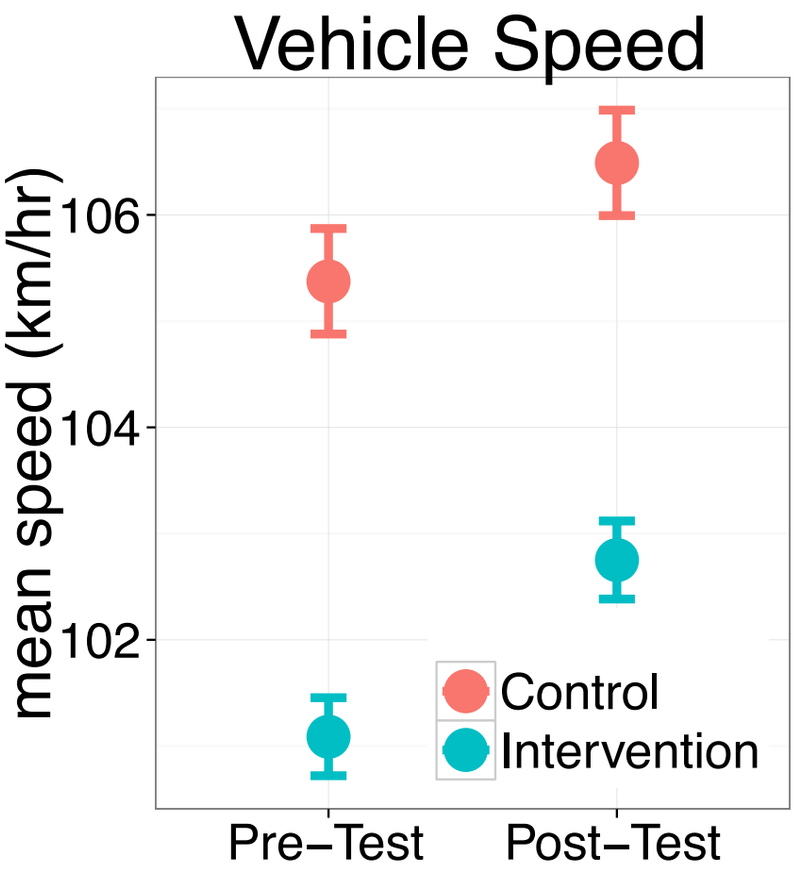
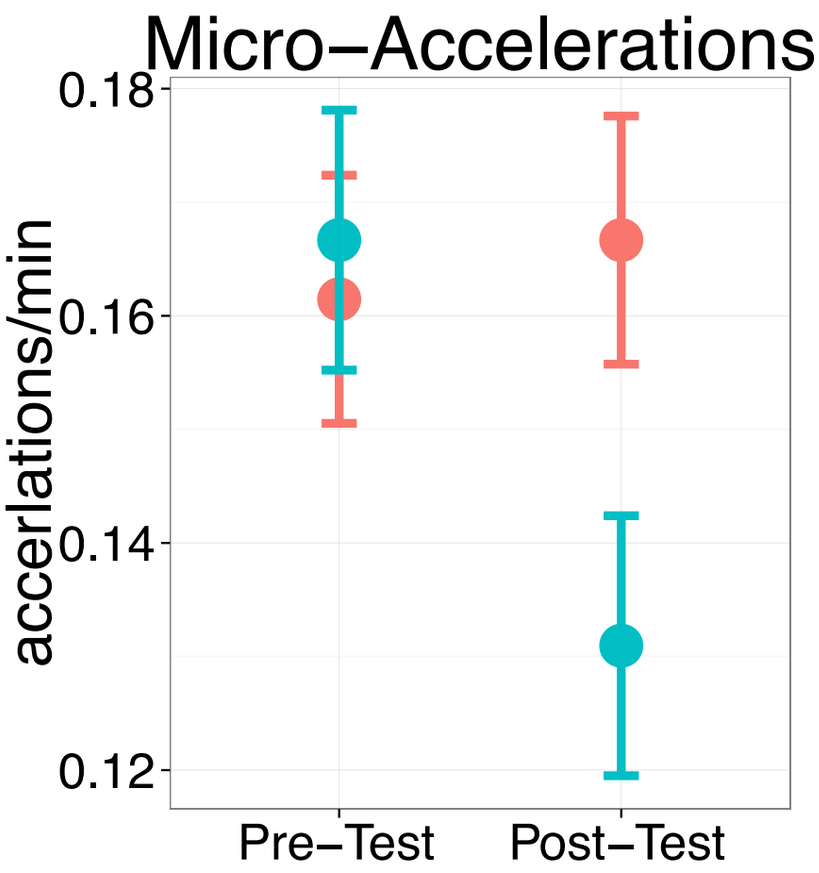
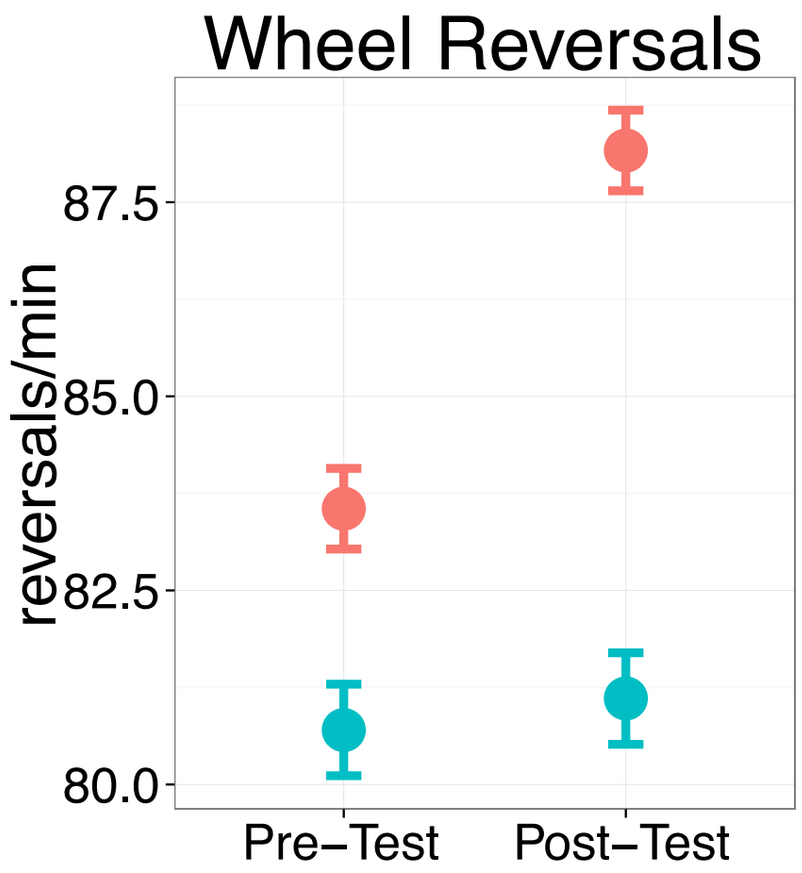
Results: Driving Behavior







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Discussion: Our Limitations

- Small sample (16 per group).
- Motivated, high functioning, and educated.
- Control group seemed to start “better”.
- Light training regimen, difficult to ensure compliance.
- Peripheral detection tasks not included in pre-test and post-test sessions.

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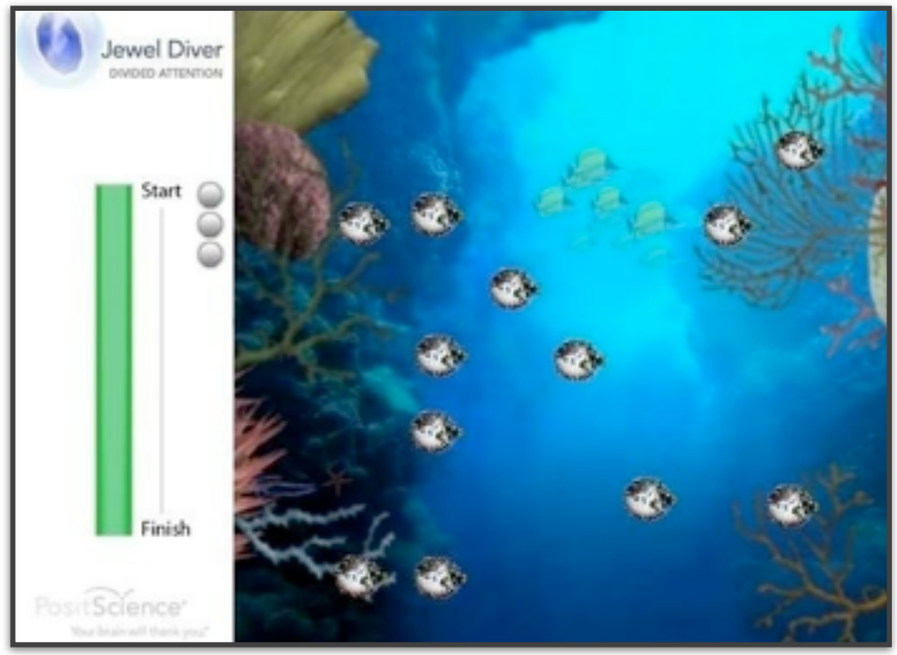
Discussion: Can It Transfer?

- Previous studies of *Drivesharp* have used neuropsychological tests as dependent measures.
  (Smith et al., 2009; Wolinsky et al., 2011)

- Studies demonstrating transfer of UFOV training have employed professionally administered, customized training regimens.
  (Roenker et al., 2003)

- *Drivesharp* stimuli are simple compared to those from studies that have shown transfer effects.
  (Franceschini et al., 2013; Green et al., 2010)



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Thank you!

Questions?

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