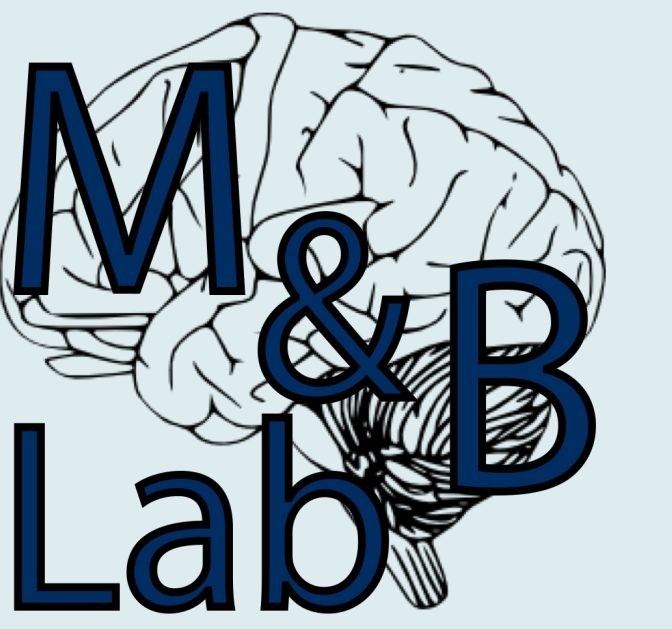




Working Memory Recall and Recognition in hmTBI

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Introduction

- Mild traumatic brain injury (mTBI), or concussion, affects 2 million/yr in the U.S.¹
- Undergraduates with a history of mTBI (hmTBI, >4 yrs post-injury) show working memory (WM) deficits²
- Most WM tasks test retrieval with **recognition**, which engages posterior brain structures^{3,4}
- WM **recall** relies on frontal networks⁴
- Impulsive people are more likely to sustain head injuries^{5,6}

To examine the effect of hmTBI on WM in finer detail, we tested undergraduate students with hmTBI and controls in a recognition and recall task.

Questions

- 1) Does *hmTBI* impair recall and recognition equally?
- 2) Does *impulsivity* vary between hmTBI and controls, and does it relate to WM performance differences?

Methods

Participants

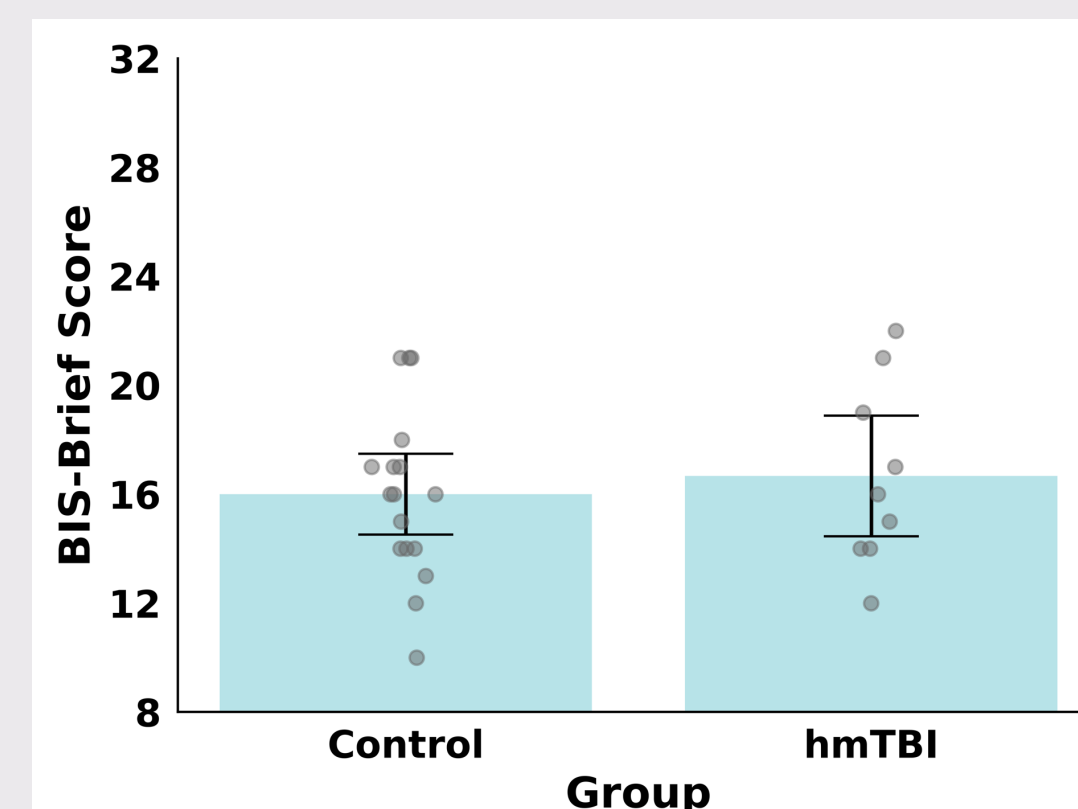
- **hmTBI:** n = 9
 - 1 male, 8 females
 - Age: $M = 20.8$ yrs, $SD = 2.16$
 - Avg: 4.0 yrs post-injury
- **Control:** n = 17
 - 6 males, 10 females, & 1 other
 - Age: $M = 19.5$ yrs, $SD = 1.37$

Barratt Impulsiveness Scale-Brief (BIS-Brief)⁷:

- Range: 8–32, greater score = higher impulsivity

Visual WM recognition task⁸:

- Indicate whether square matches corresponding sample square (50% old, 50% new)
- Measured accuracies and reaction times (RT)



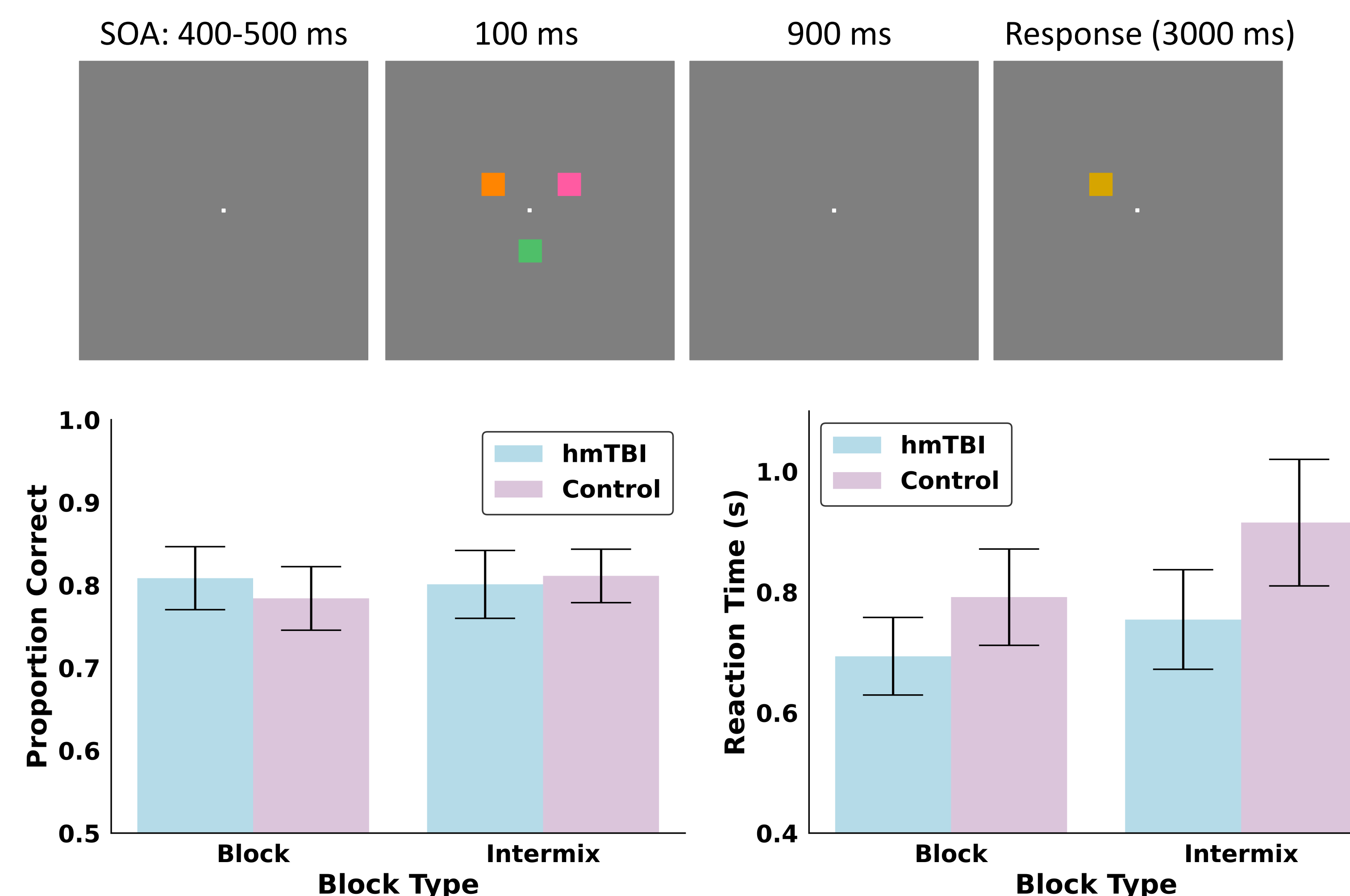
Visual WM recall task⁸:

- Report color of cued square using a color wheel
- Recorded degree of error (distance from actual color)

- Blocked trials: one strategy dominates
- Intermixed trials allow us to see dual performance

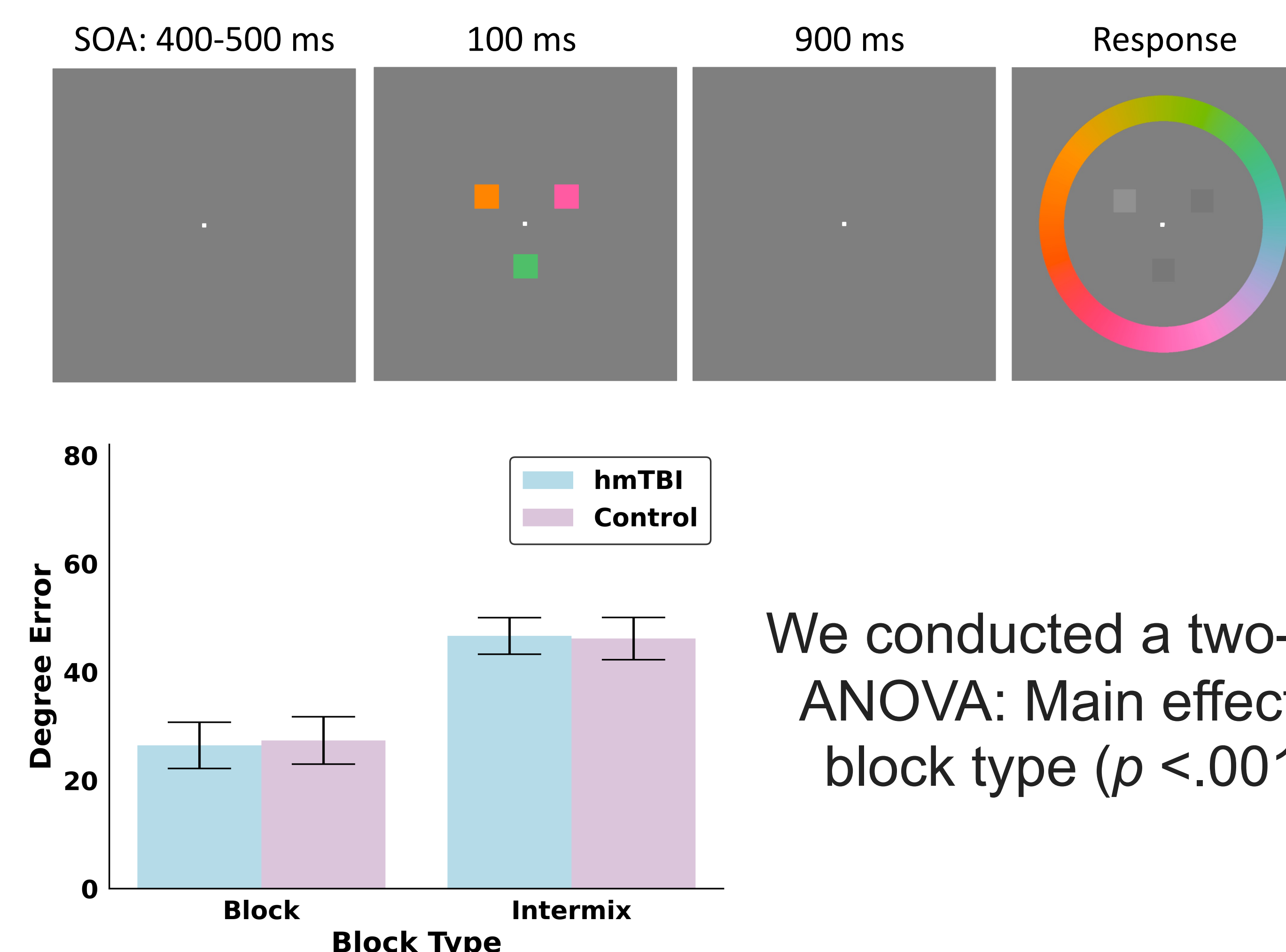
Results

Is WM recognition impaired in hmTBI? NO



We conducted a two-way MANOVA: Main effect of block type for RT ($p < .001$).

Is WM recall impaired in hmTBI? NO

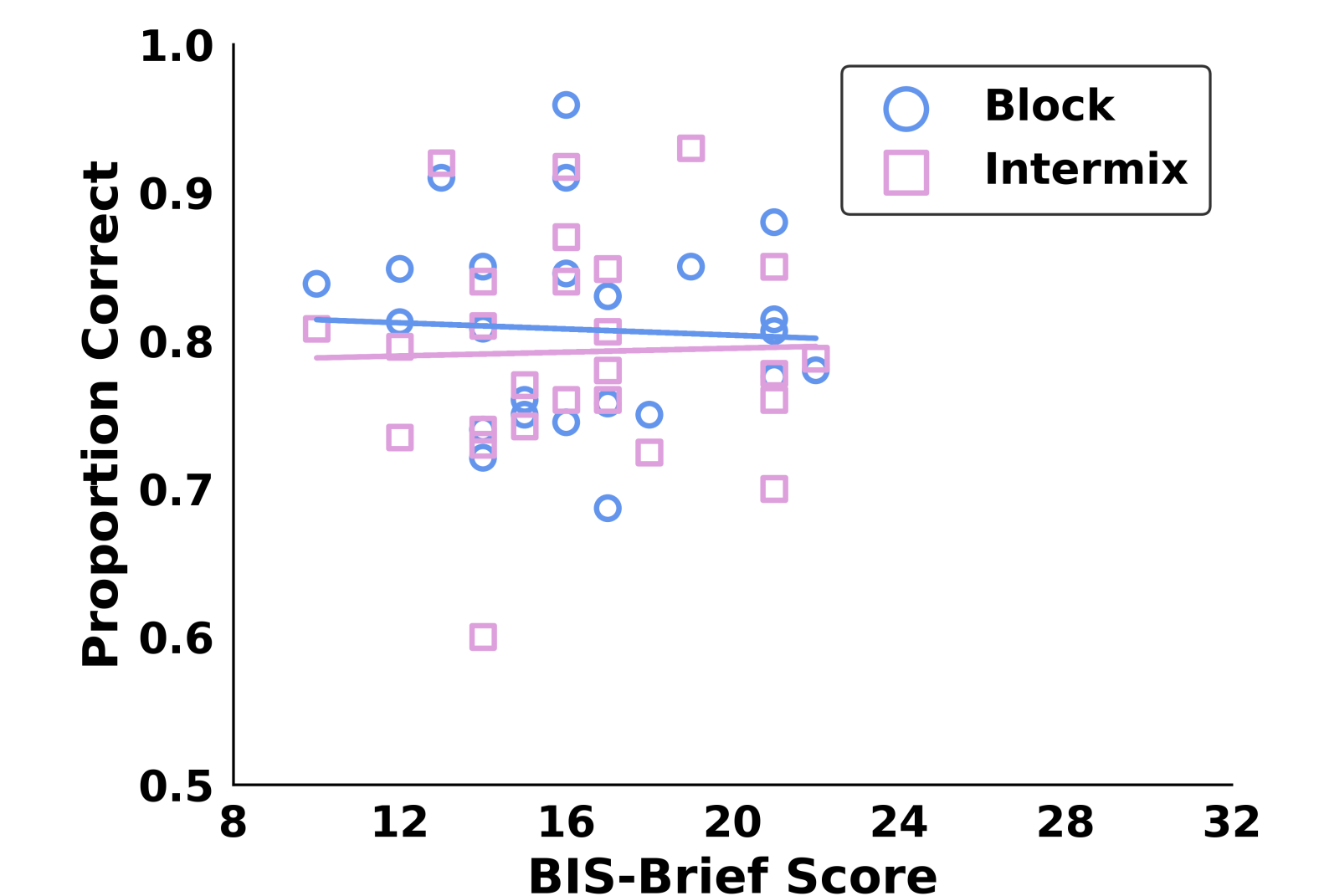


We conducted a two-way ANOVA: Main effect of block type ($p < .001$).

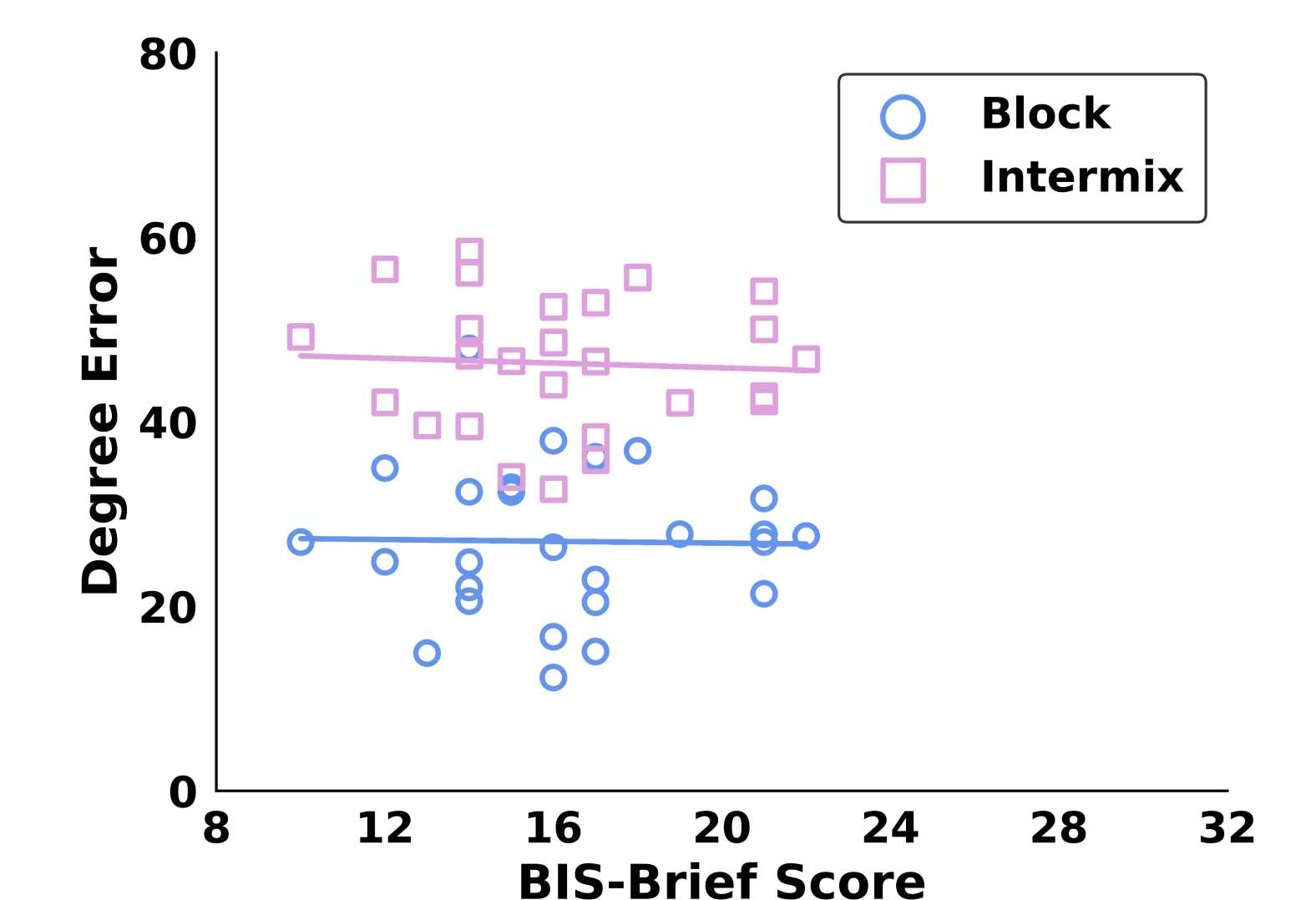
Results Continued

Does impulsivity relate to WM differences? NO

Recognition



Recall



Discussion

- Current undergraduates with hmTBI perform similarly to controls
- Main effect of block type (block better than intermix) suggests one strategy dominates
- No differences in impulsivity between hmTBI and controls in contrast to predictions
- Impulsivity does not relate to WM performance

Future Directions:

- Data collection underway (goal n = 25 for hmTBI and control)

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Scan QR code for references:

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