Mind-wandering during encoding impairs recognition for both forgettable and memorable complex scenes

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Background

Mind-wandering, or task-unrelated thinking, occurs often and impairs memory encoding [1].

Memorability is a stimulus-inherent attribute that predicts memory across populations [2].

Here, we investigated whether image memorability interacts with mind-wandering episodes to affect recognition memory. Subjects studied memorable or forgettable images while being probed for mind-wandering. Then, they completed an old/new recognition memory test.

Preregistered Hypotheses:

1. Mind-wandering will affect recognition performance.

2. Memorability will affect recognition performance.

3. Mind-wandering and memorability will not interact and instead uniquely predict recognition performance.
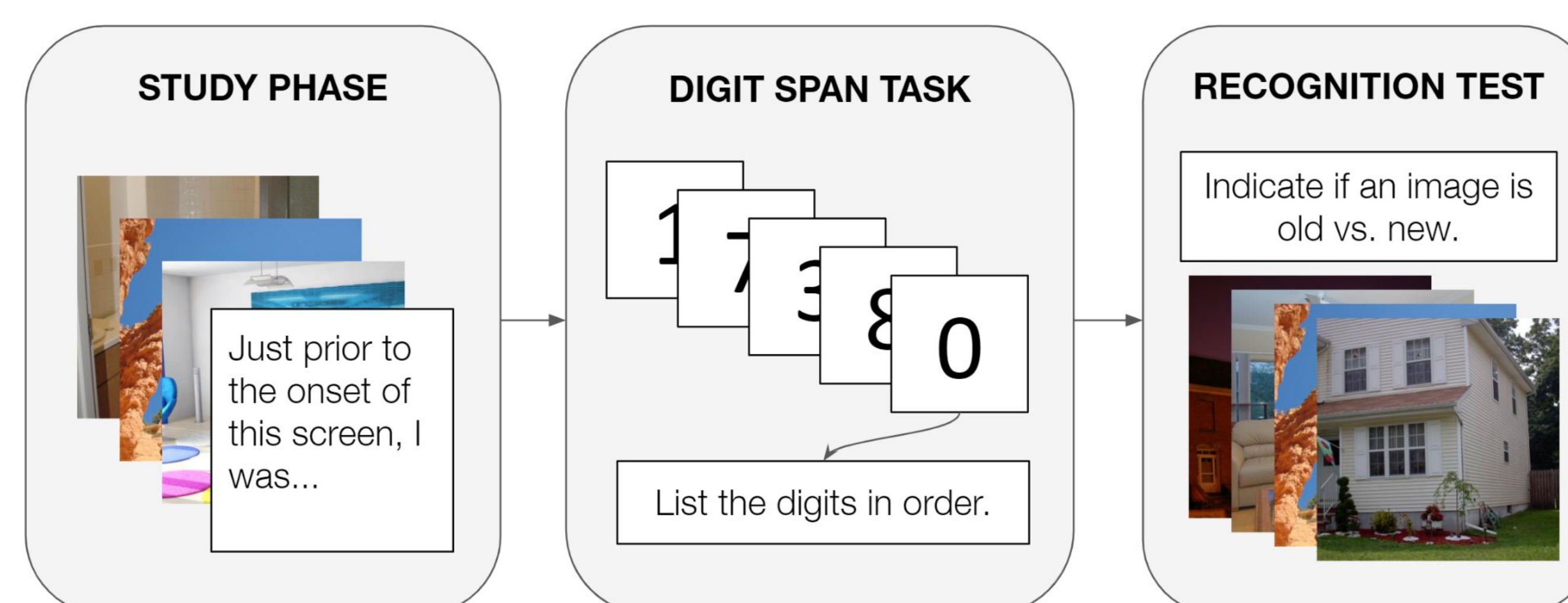
Method

Participants: n = 60 (39 female), M_{age} = 18.9 years ± 1.02

Design: mixed; 2 (between—memorable vs. forgettable images) x 2 (within—mind-wandering [MW] vs. on-task [OT])

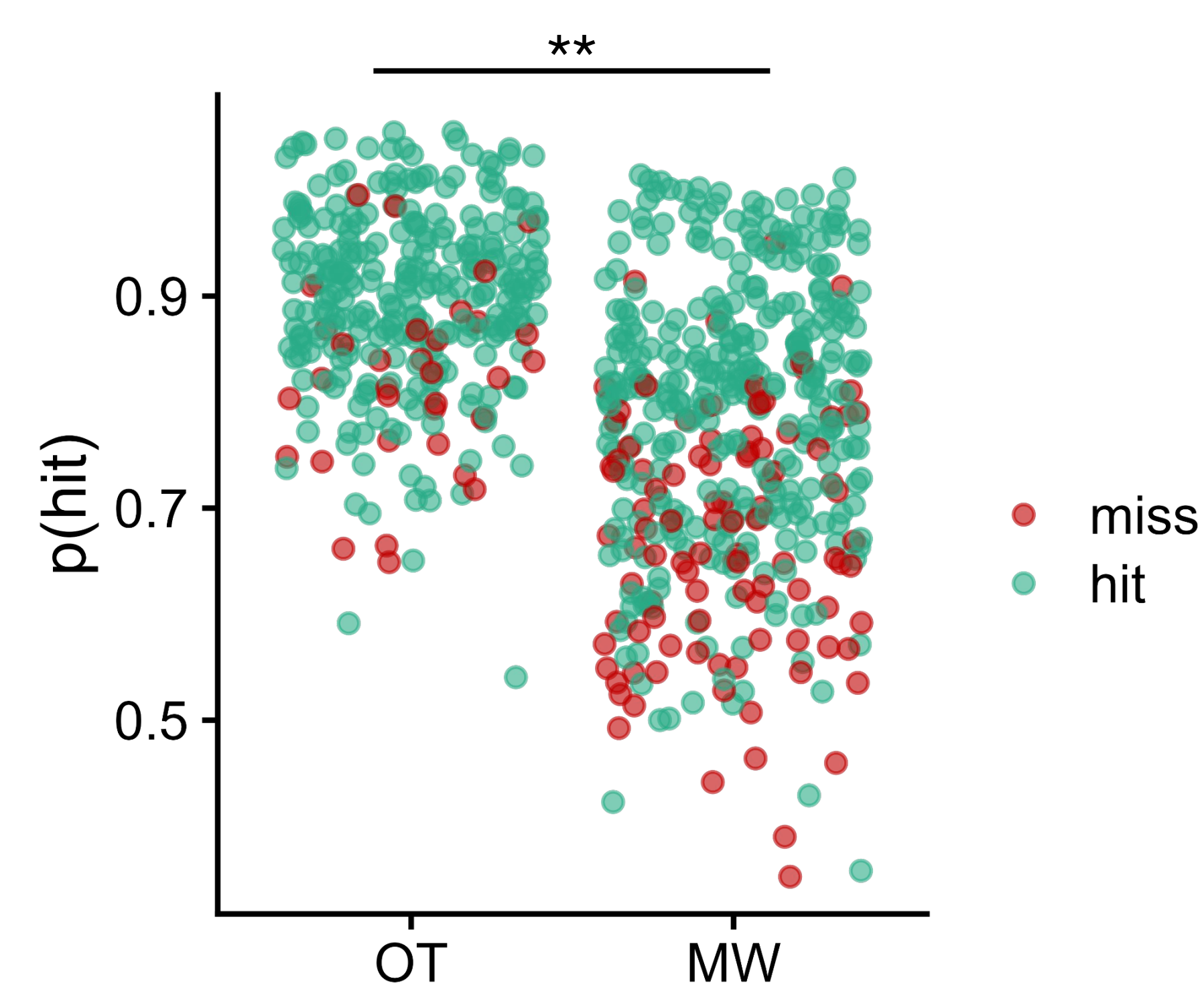**Stimuli:** 24 memorable, 24 forgettable, 24 neutral scenes [3]
- matched for category, low-level visual features, and number of objects
- memorability categorization determined by hit rates in previous large-scale recognition studies [4, 5]; M_{HR} ± 0.5 SD

Metrics: hits, false alarms, d-prime, criterion

STUDY PHASE — Just prior to the onset of this screen, I was...

DIGIT SPAN TASK — List the digits in order.

RECOGNITION TEST — Indicate if an image is old vs. new.
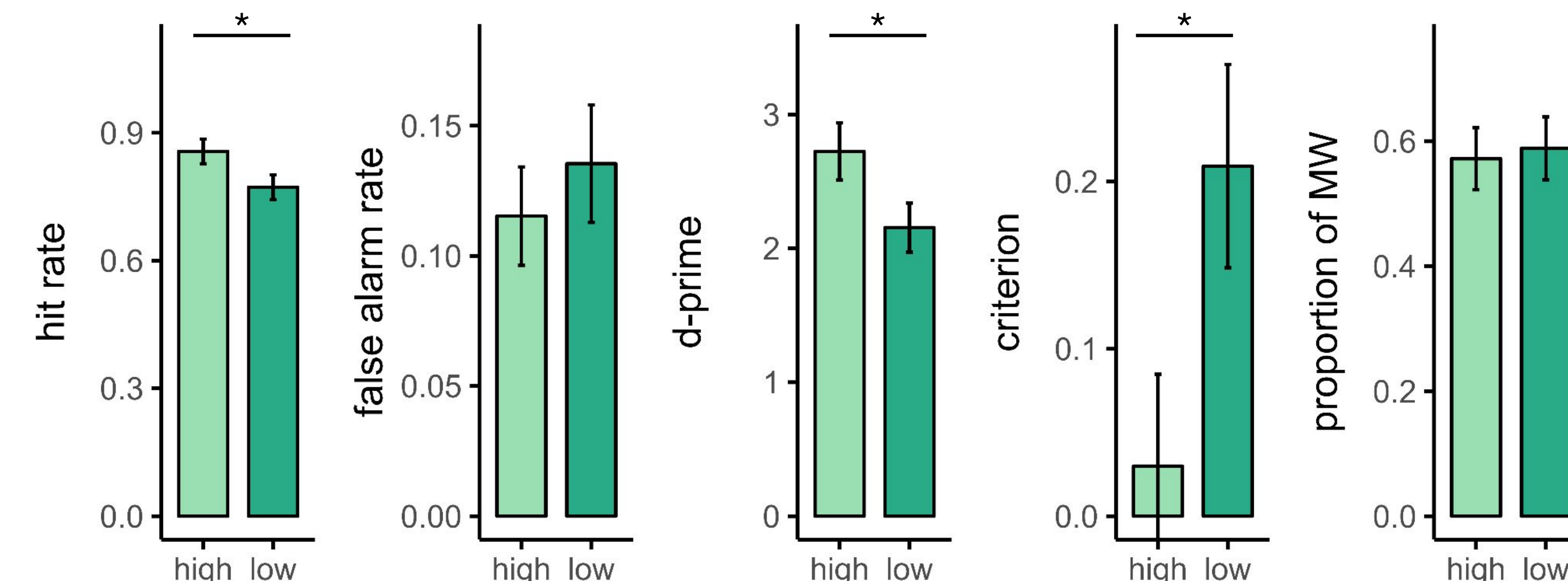
Results

Mind-wandering → worse recognition memory

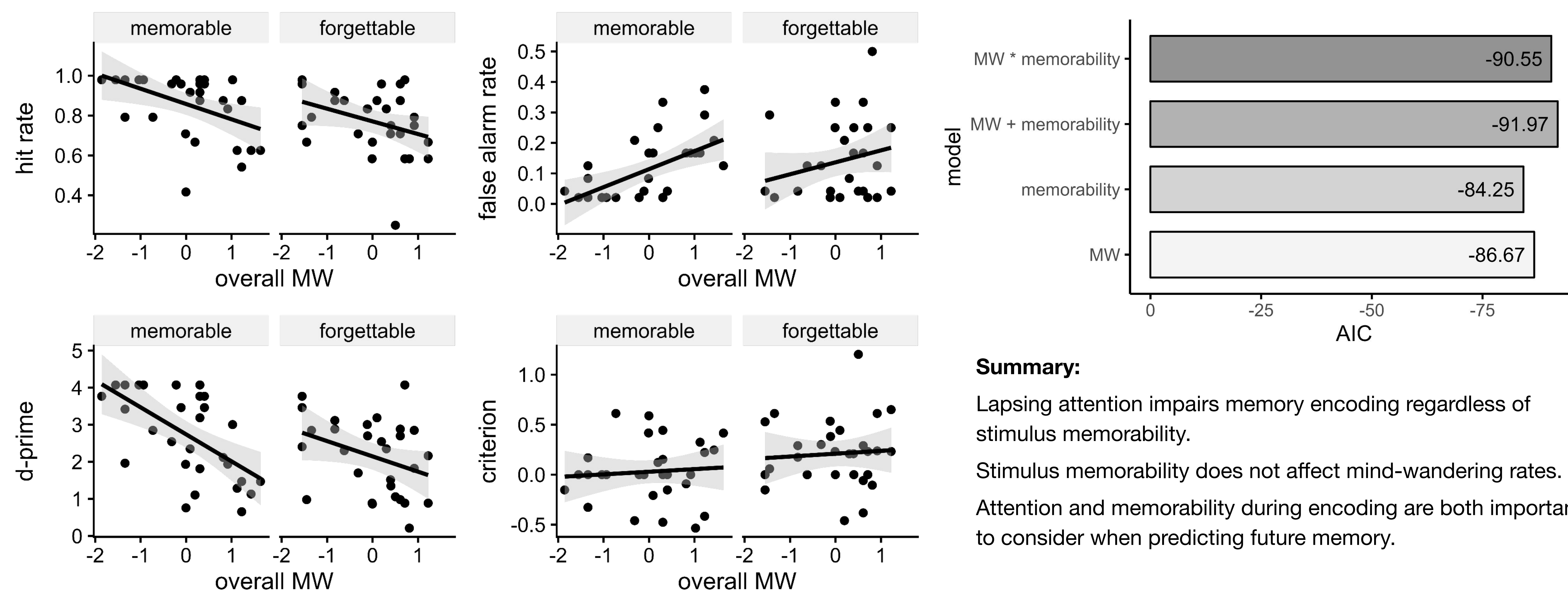**Higher image memorability → better recognition memory**

*p < .05, **p < .01

Mind-wandering and memorability do not interact

model	AIC
MW * memorability	-90.55
MW + memorability	-91.97
memorability	-84.25
MW	-86.67

Summary:

Lapsing attention impairs memory encoding regardless of stimulus memorability.

Stimulus memorability does not affect mind-wandering rates.

Attention and memorability during encoding are both important to consider when predicting future memory.

References: [1] Blondé et al. 2022 [2] Bainbridge 2019 [3] Bainbridge et al. 2019 [4] Isola et al. 2011 [5] Bylinskii et al. 2015