

BACKGROUND

- How are we able to overcome our limited field of view to operate efficiently in 360° space?
- One cognitive mechanism could be the prioritization of certain visual information in perceptual awareness
- Previous research has suggested that memory and navigational affordances influence the speed of perceptual awareness [1, 2]

QUESTION *Do navigational affordances interact with the role of memory in influencing the speed of perceptual awareness?*

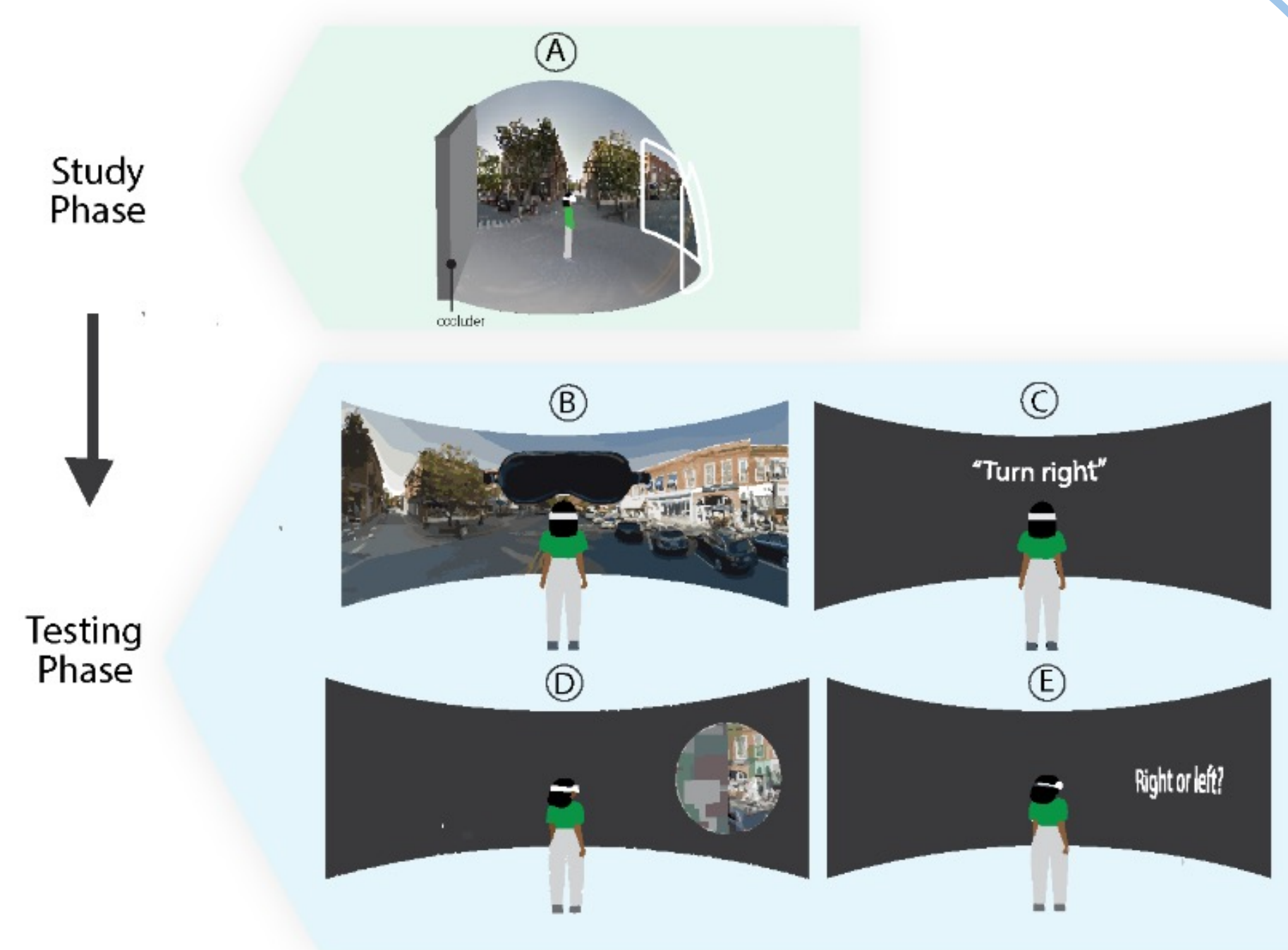
METHODS

STUDY PHASE:

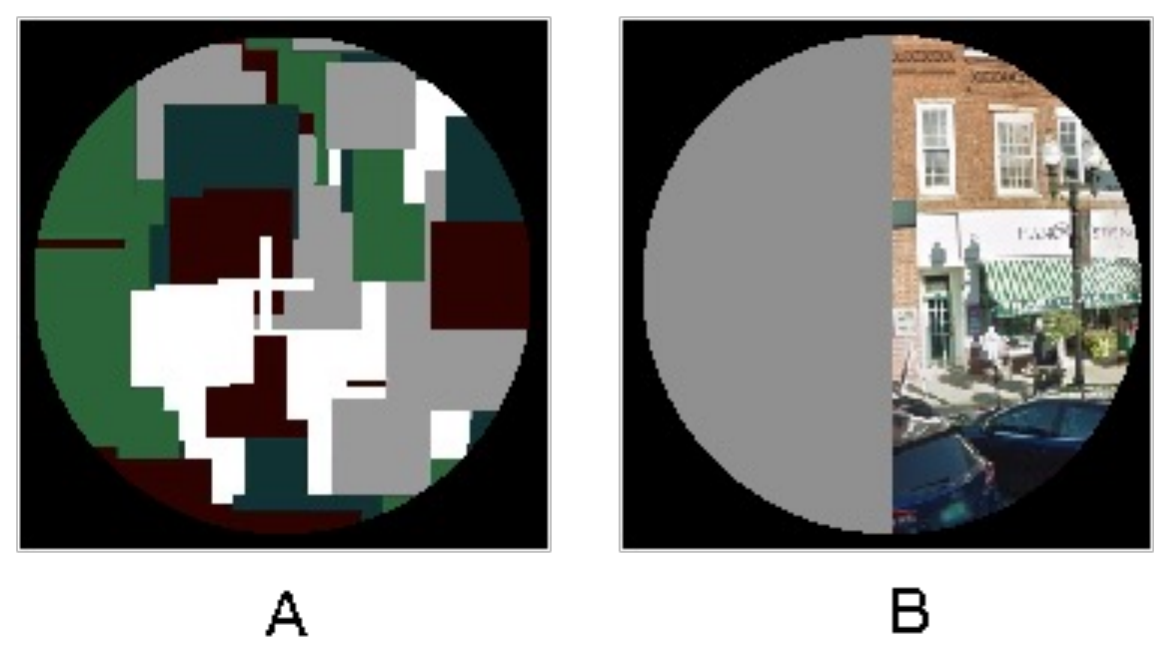
(A) Participants (N = 64) study 4 scenes in Virtual Reality.

TESTING PHASE:

- (B) Participants are primed with a scene. After they refamiliarize themselves with the scene, a mask appears.
 (C) They hear audio instructions to turn 90° left or right.
 (D) bCFS paradigm occurs. They press a button once they detect the target image.
 (E) They indicate whether the target image was on the left or right. The trial repeats (32 trials in total).



Dominant Eye Non-Dominant Eye



BREAKING CONTINUOUS FLASH SUPPRESSION (bCFS)

Two different images are shown to each eye. (A) The dominant eye is shown flashing rectangles, which suppress (B) the target image being shown to the non-dominant eye. Eventually the target image will become visible, and the participant will press a button once they detect the image [3].

INDEPENDENT & DEPENDENT VARIABLES

Independent Variables:

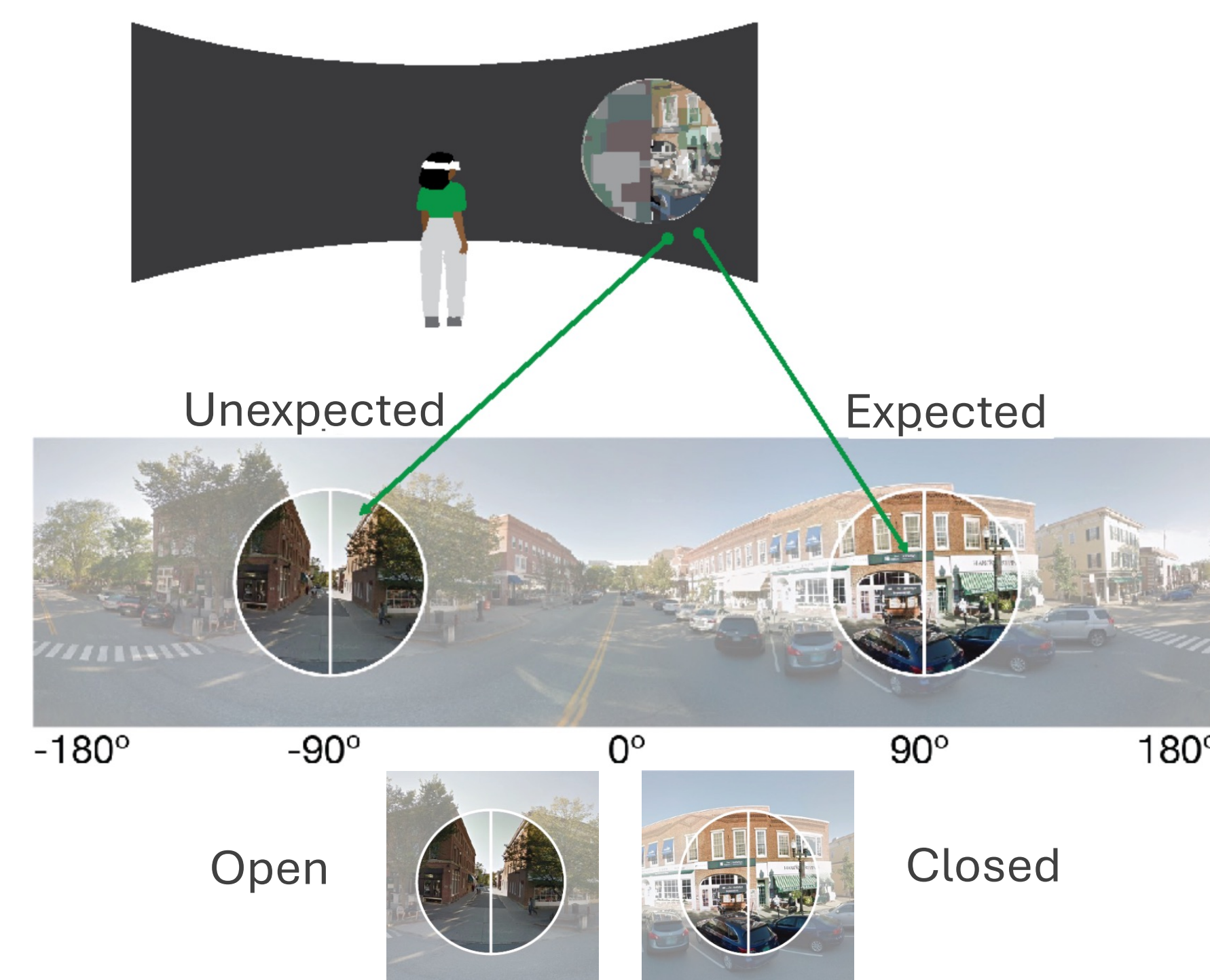
Memory:
Expected vs. Unexpected Trials

Navigational Affordance:
Open vs. Closed Trials

Dependent Variable:

Response Time (s)

	Open	Closed
Expected	Open Expected	Closed Expected
Unexpected	Open Unexpected	Closed Unexpected



RESULTS

Linear Mixed Effects Model

Fixed Effects & Random Effects

$$rt \sim \text{open_closed} * \text{isCongruent} + \text{sceneName} + \text{semiSide} + \text{testView} + (1 | \text{subject_id})$$

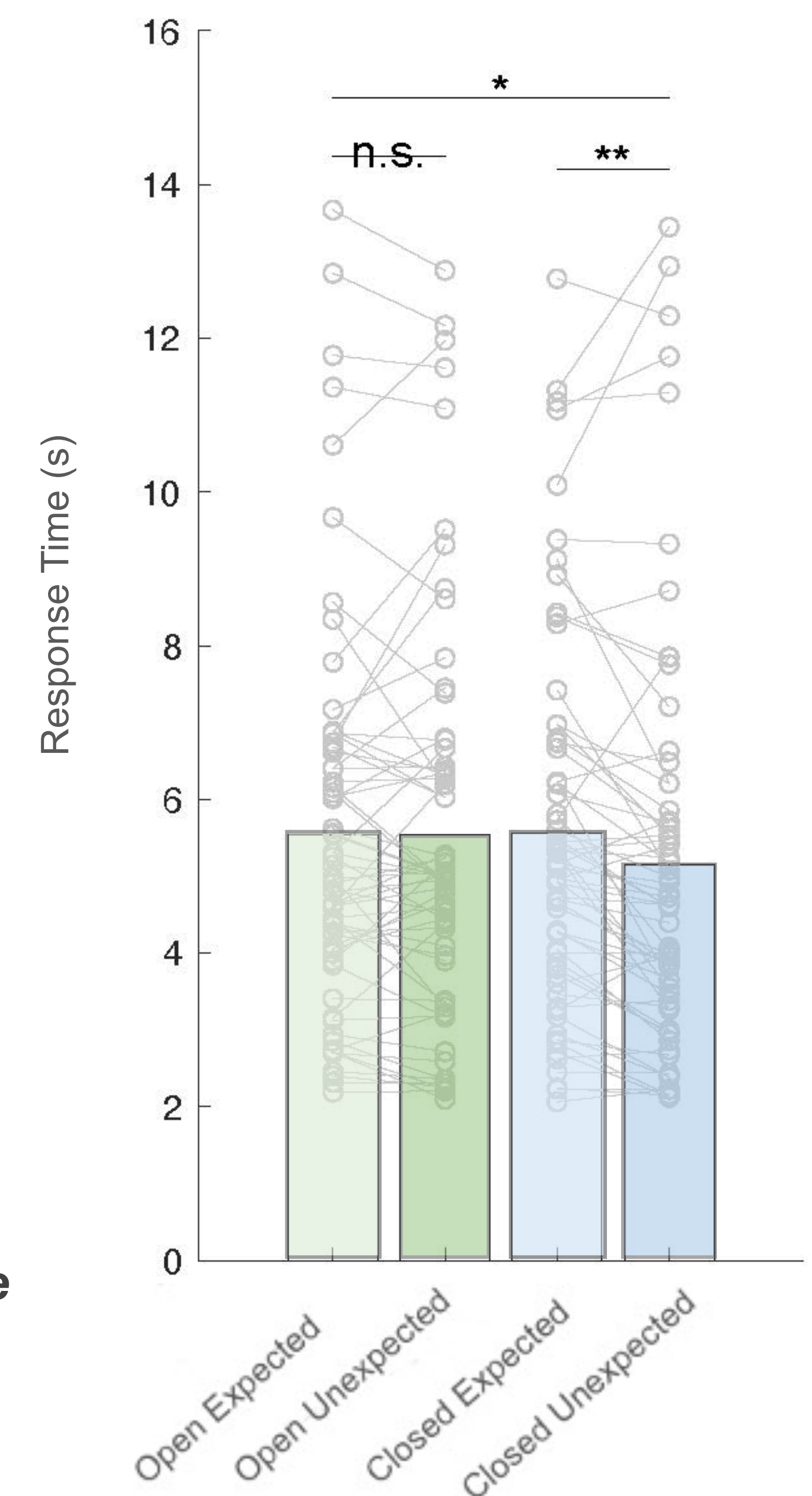
Significant Main Effects

- (1) **Memory:** Unexpected scene views were detected significantly faster than expected scene views ($p < .05$).
- (2) **Navigational Affordance:** Closed scene views were detected significantly faster than open scene views ($p < .05$).

Significant Interaction

There was a significant interaction between memory and navigational affordances.

There was a significant difference between expected and unexpected trials for closed scene views but not for open scene views.



CONCLUSION

Navigational affordances interact with the role of memory in influencing the speed of perceptual awareness in real-world scenes.

FUTURE DIRECTIONS

- How does movement (walking into the scene) influence the results?
- How does the strength of a memory influence the results?

REFERENCES

- [1] Jiang, Y., Costello, P., & He, S. (2007). Processing of invisible stimuli: Advantage of upright faces and recognizable words in overcoming interocular suppression. *Psychological science*, 18(4), 349-355. [2] Korisky, U., & Mudrik, L. (2021). Dimensions of perception: 3D real-life objects are more readily detected than their 2D images. *Psychological Science*, 32(10), 1636-1648. [3] Tsuchiya, N., & Koch, C. (2004). Continuous flash suppression. *Journal of Vision*, 4(8), 61-61.