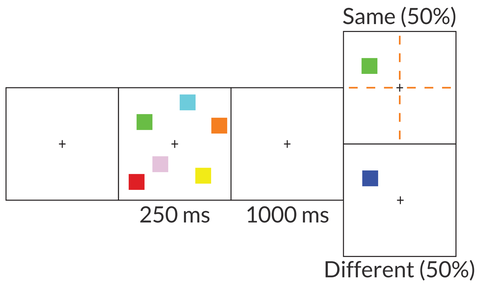
Spatial Biases in Visual Working Memory Encoding Persist Despite Controlled Gaze Position

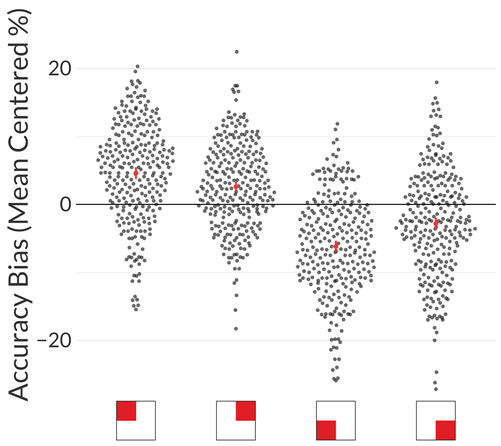
Colin Quirk[1,2] Albert Chen[2] Edward K Vogel[1,2]

[1]Department of Psychology, University of Chicago [2]Institute for Mind and Biology, University of Chicago

Previous Findings

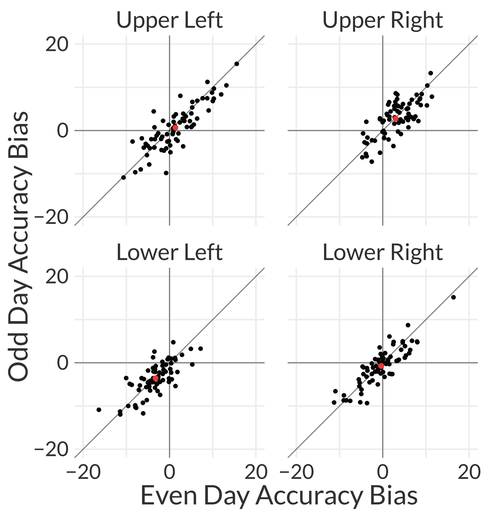
Change detection assumes a random subset of items are remembered, but this assumption has not been thoroughly tested.





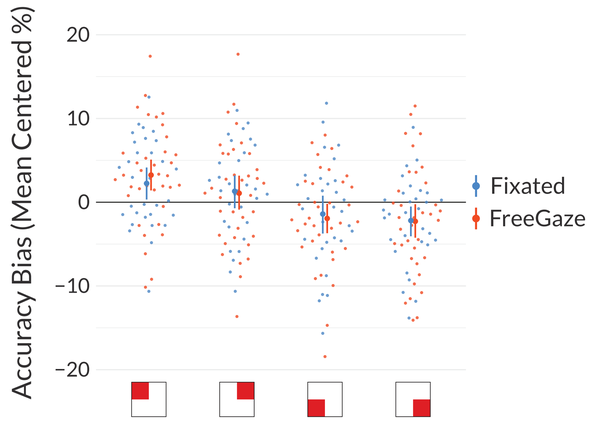
In a change detection study (n=273), we observed an overall bias towards remembering items in the top-left, with substantial individual differences.

In a follow-up study, participants (n=79) completed a change detection task every day for 30 days. Even day and odd day bias were highly correlated in all quadrants, suggesting this bias is a stable trait.



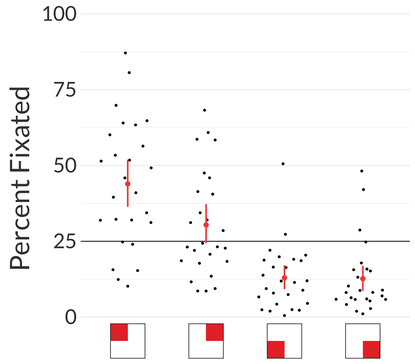
Does this bias survive tight control of fixations? Do fixations show a similar pattern to behavioral data?

Eye Movements

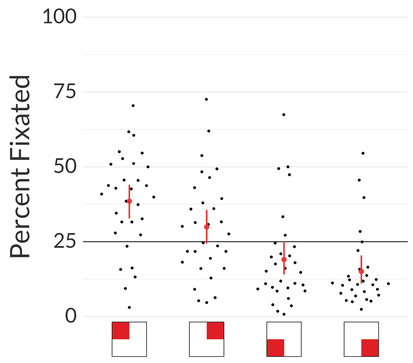


Participants (n=36) show an identical bias, regardless of whether or not they are allowed to move their eyes.

First Fixation per Quadrant

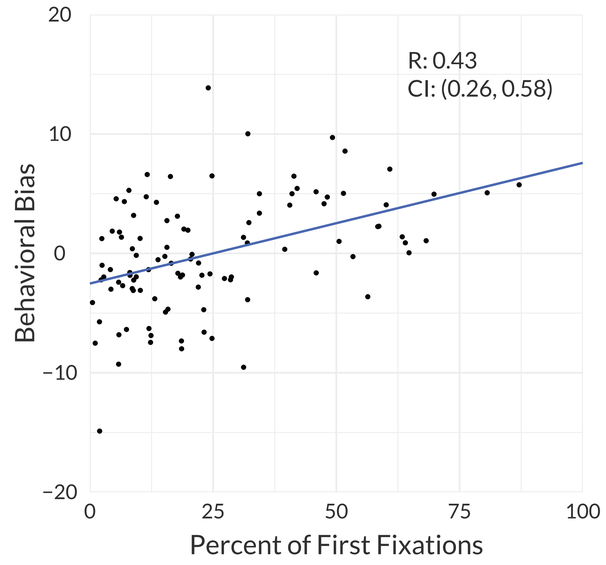


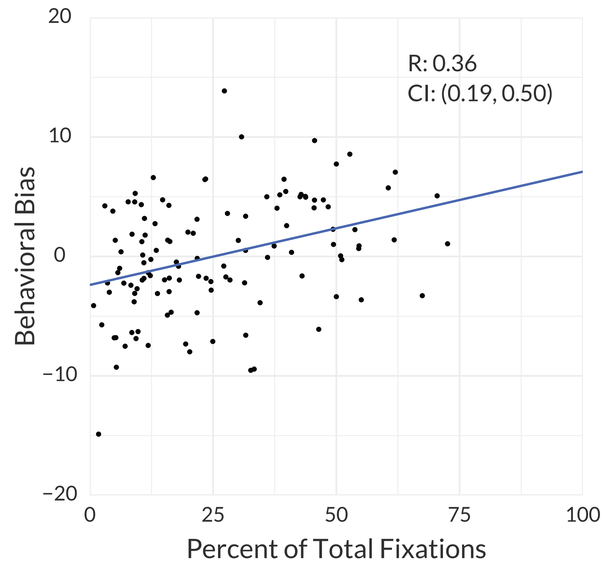
Total Number of Fixations per Quadrant



When participants are able to move their eyes, their fixations follow a similar pattern to the behavioral data.

Correlations with Behavior





Conclusions

- In change detection, there is a highly reliable bias that trends towards the top-left at the population level
- This bias survives tight control of eye movements, meaning it cannot be explained by a bias in eye position
- Where participants choose to look is correlated with their behavioral bias, suggesting a common mechanism