

Competition induces exaggeration in human memory

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Introduction

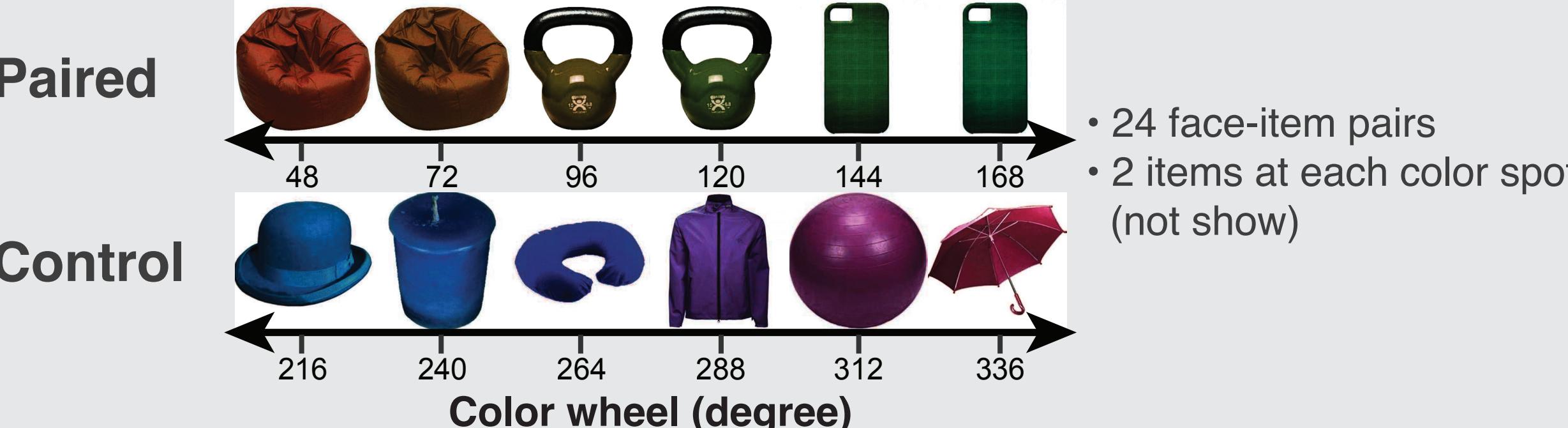
- Feature overlap between memories triggers repulsion of neural activity patterns.^{1,2,3,4,5}
 - Overlapping memories' neural representations become less similar than non-overlapping memories'.¹
- Repulsion is thought to be adaptive (less interference).²



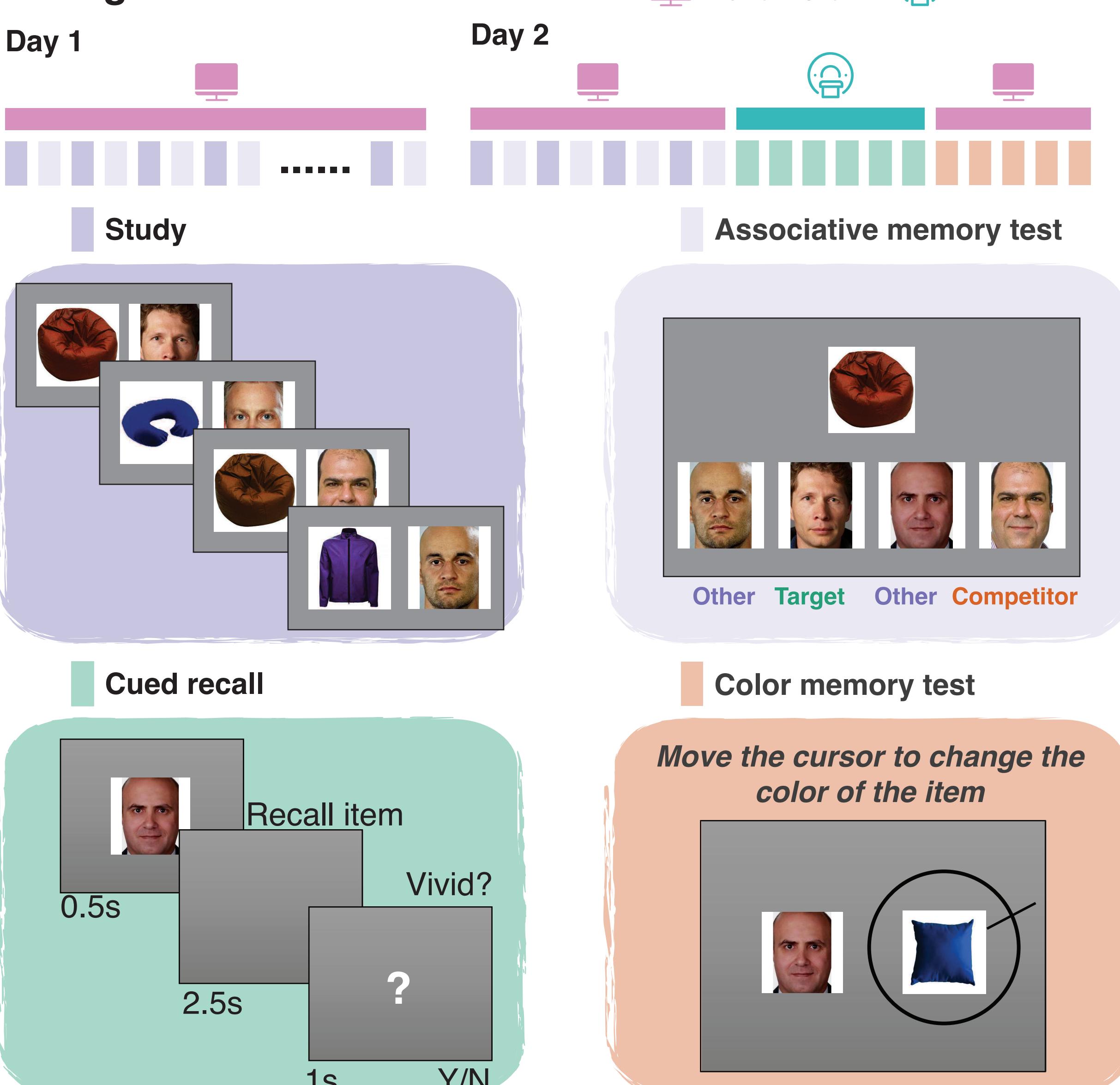
If neural representations are exaggerated, are the memory features exaggerated?

Method

- Approach Use a memory feature that is continuous and can be reported
- Subjects N = 23
- Stimuli
 1. Select colors every 24 degrees along the color wheel
 2. Create **Same Object Similar Colors** pairs and **Control** pairs
 3. Pair each item with a unique neutral male face

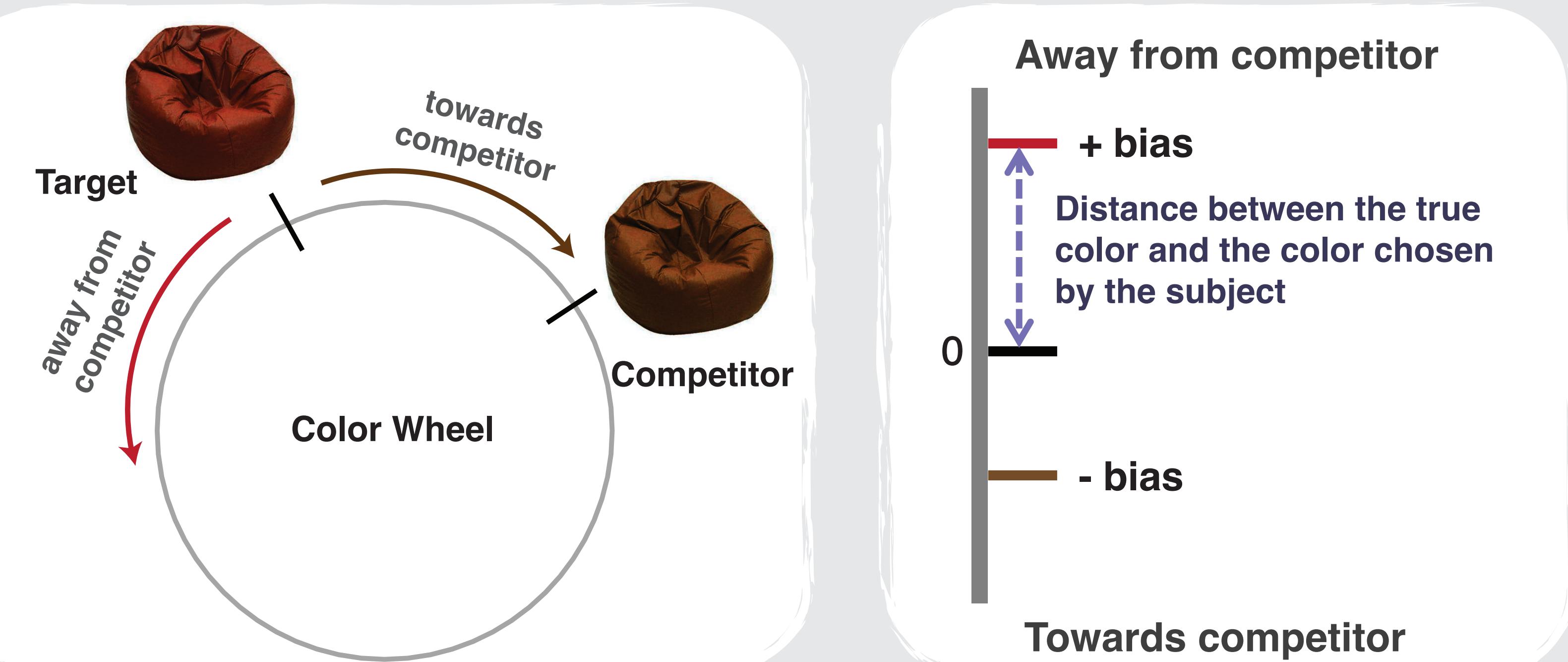


Paradigm



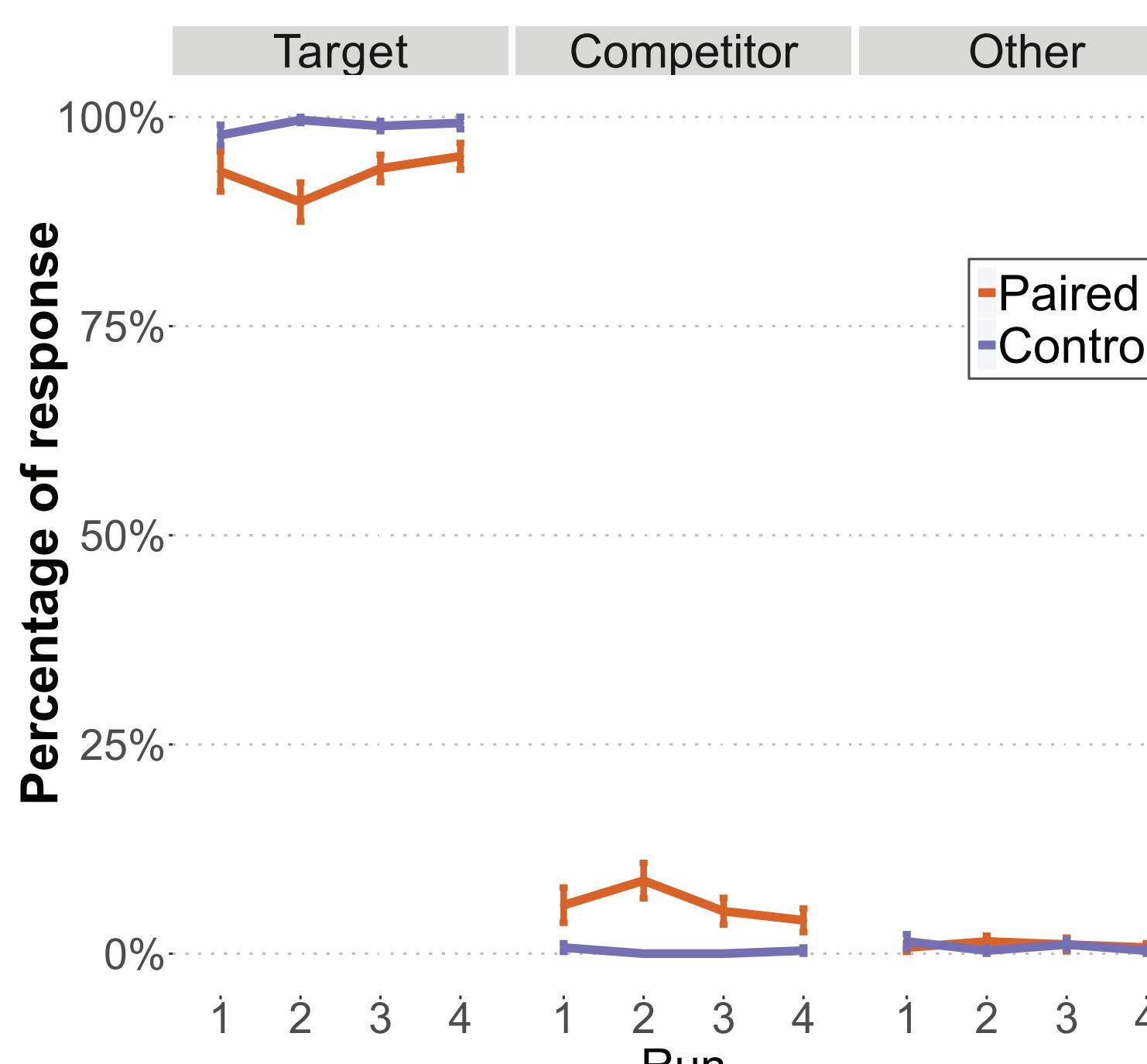
Behavioral Results

Measuring the color bias

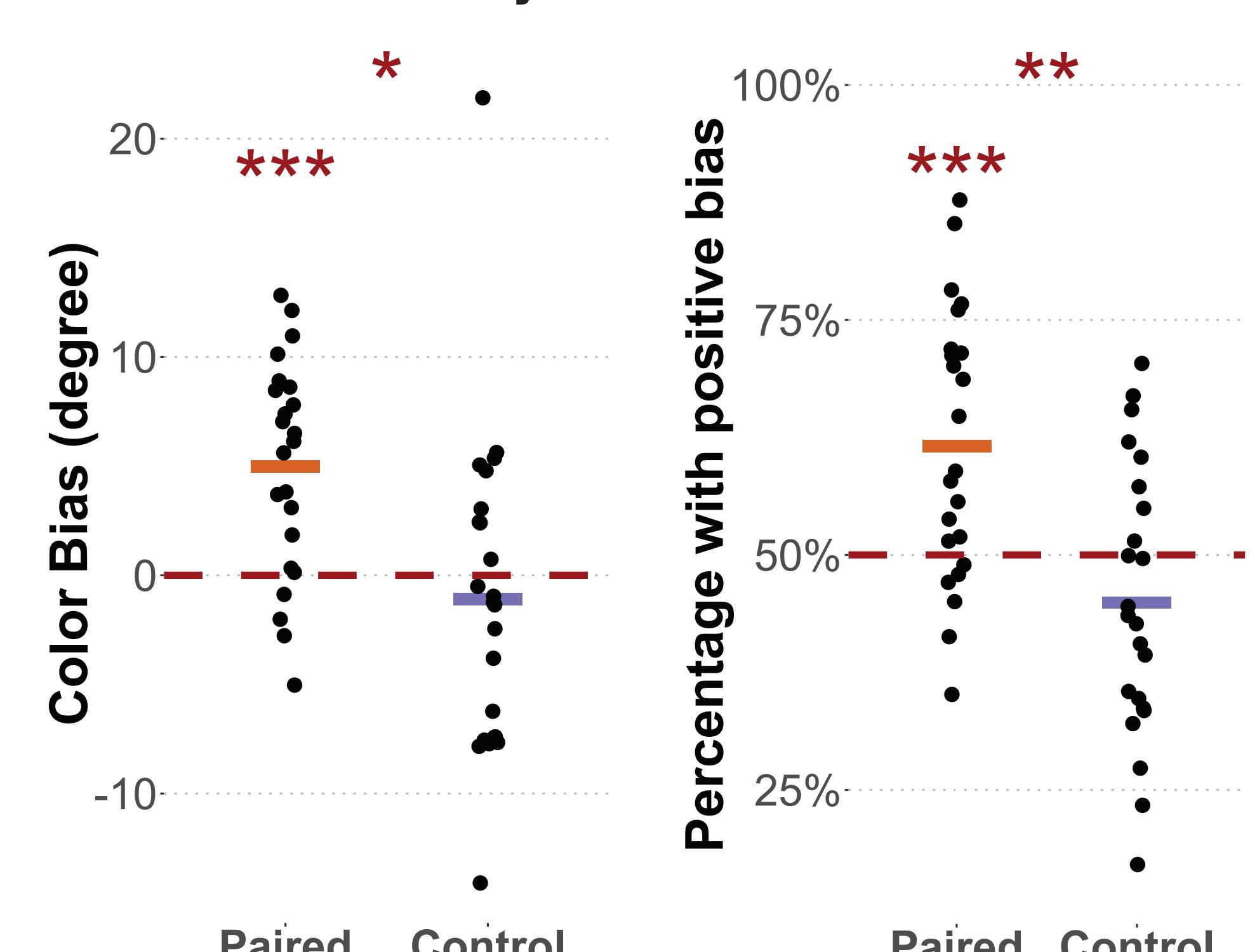


Associative memory test

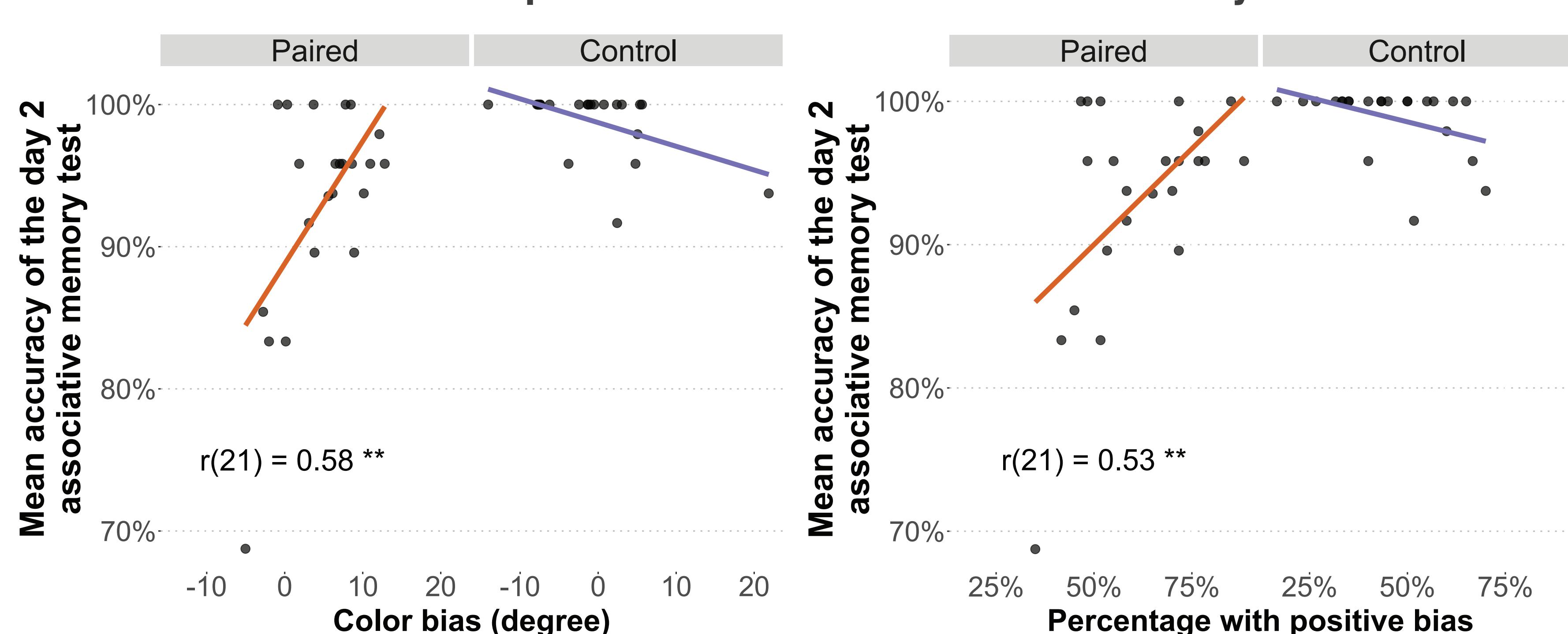
(4 runs on Day 2)



Color memory test



Color repulsion is adaptive: Greater color repulsion = Better associative memory



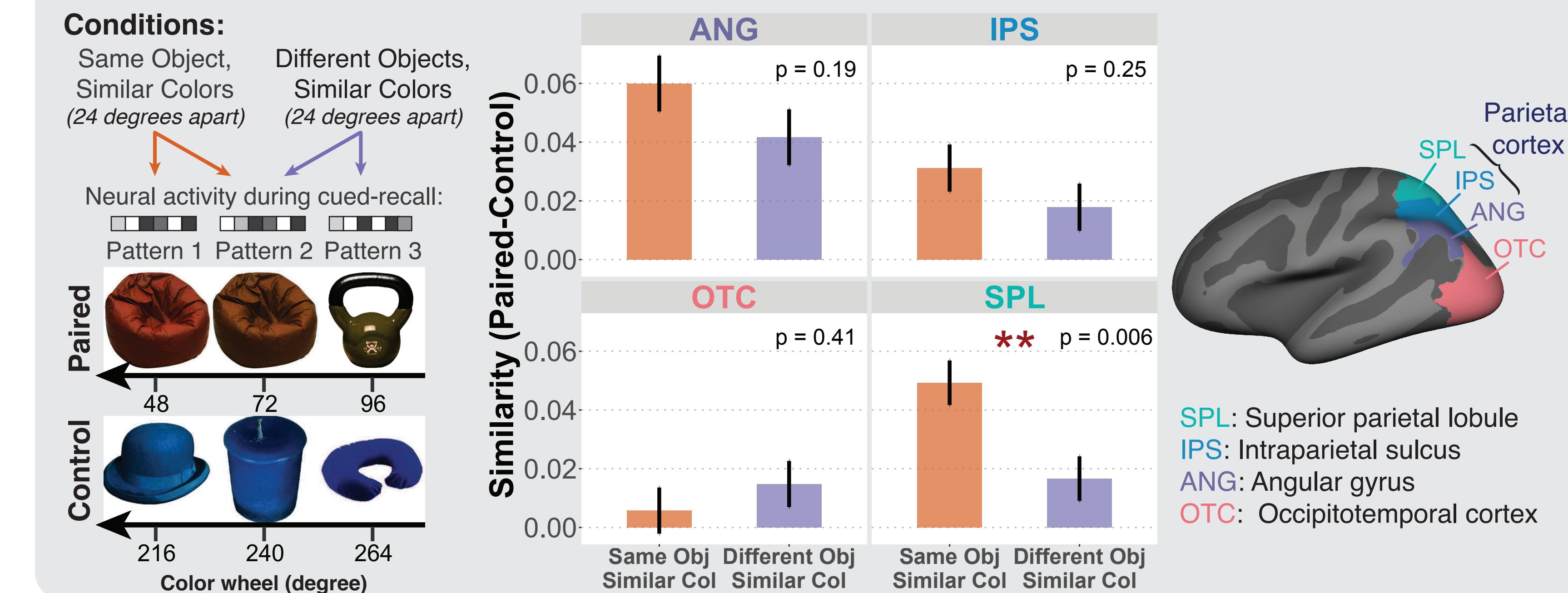
References

1. Hubert & Norman (2014) *Cerebral Cortex*
2. Favila et al. (2016) *Nat. Commun.*
3. Chanales et al. (2017) *Curr. Bio.*
4. Schapiro et al. (2012) *Curr. Bio.*
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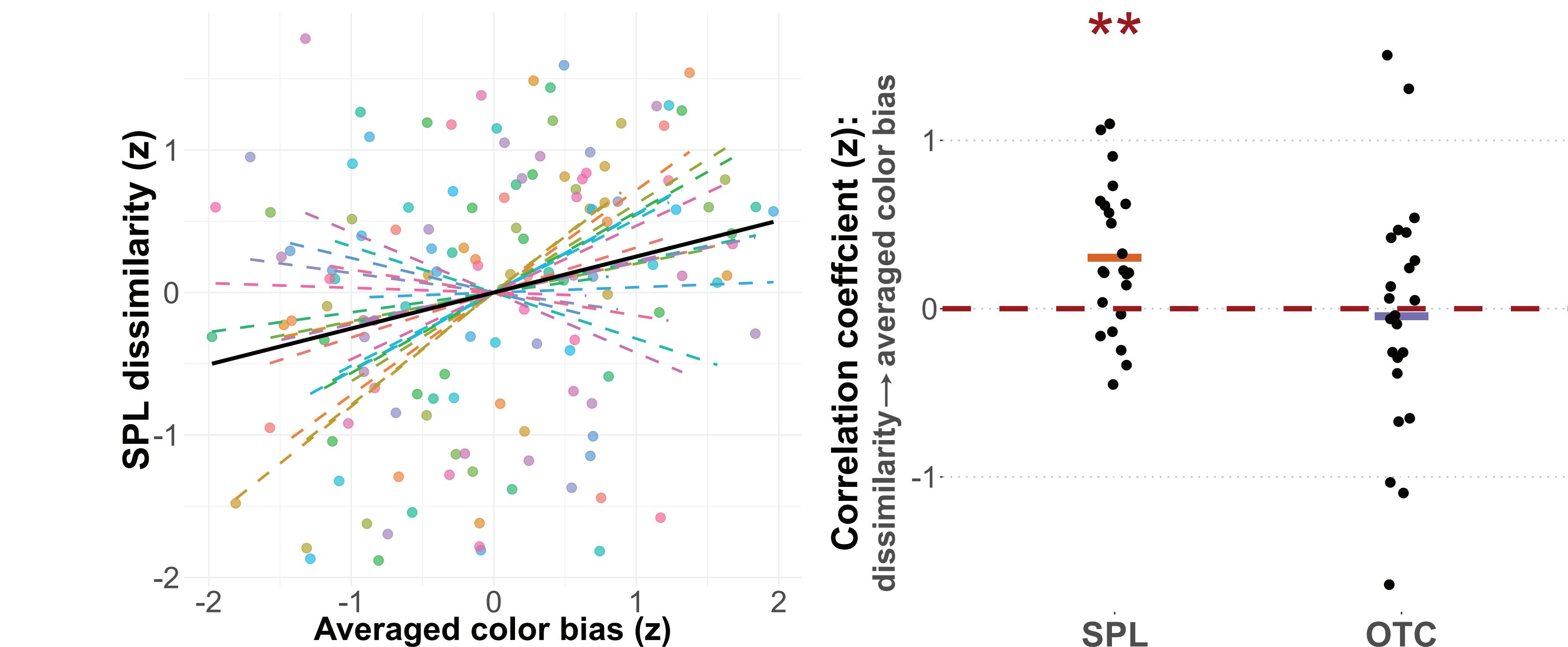
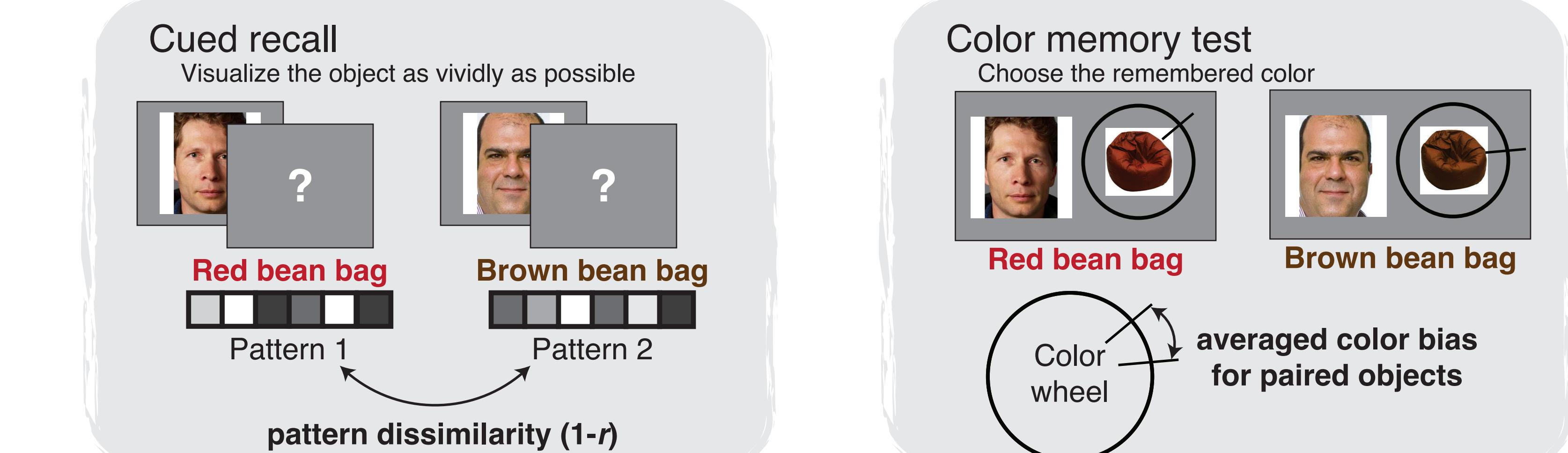
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fMRI Results

Parietal cortex is sensitive to the similarity of paired associations



Dissimilarity in parietal cortex during retrieval predicts color repulsion



Greater dissimilarity of SPL patterns = Greater color repulsion

Discussion

- Overlap triggers repulsion of feature memory.
- Repulsion of features is adaptive (less interference).
- Parietal activity patterns reflect similarity of remembered object information.
- Greater dissimilarity of SPL patterns = Greater color repulsion
 - Consistent with prior evidence of adaptive feature representations in parietal cortex.⁶

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NIH-NINDS R01 NS107727 to B.A.K. and NSF CAREER Award BCS-1752921 to B.A.K.