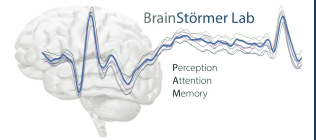


Feature-based attention warps perception of color



UC San Diego

perception of color

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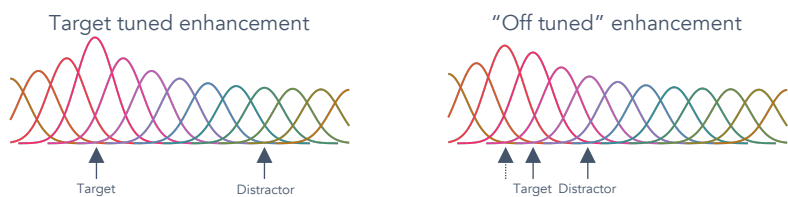
¹UC San Diego, ²Chulalongkorn University, ³Dartmouth College



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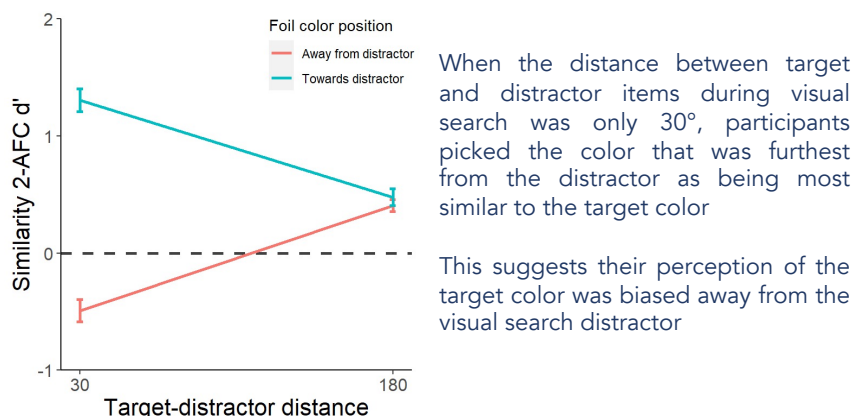
Background

- Optimal tuning theories suggest that attention enhances processing of non-target features when distractors are similar to a relevant target feature (Navalpakkam & Itti, 2007; Scolarì et al., 2009, 2011)
- Attention can impact the appearance of visual features (Carrasco, Ling, & Read, 2004; Fuller & Carrasco, 2006; Suzuki & Cavanagh, 1997)

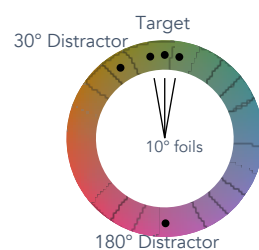
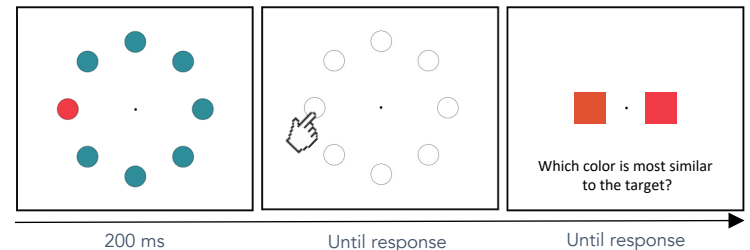


Does feature-based attention result in a biased perception of targets away from similar distractors?

Experiment 1: do similar distractors bias the perception of the target color? (n = 30)



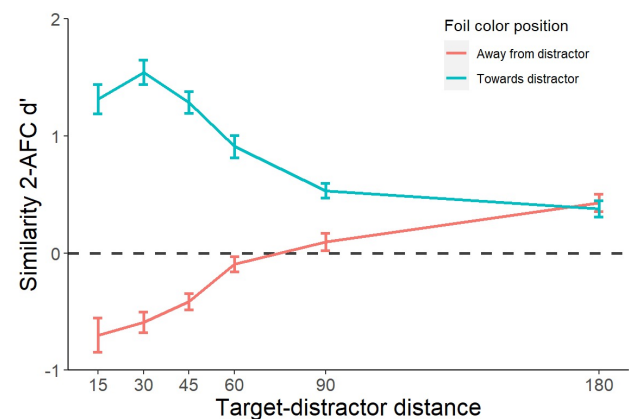
Method



Equal-luminance CIE Lab color space

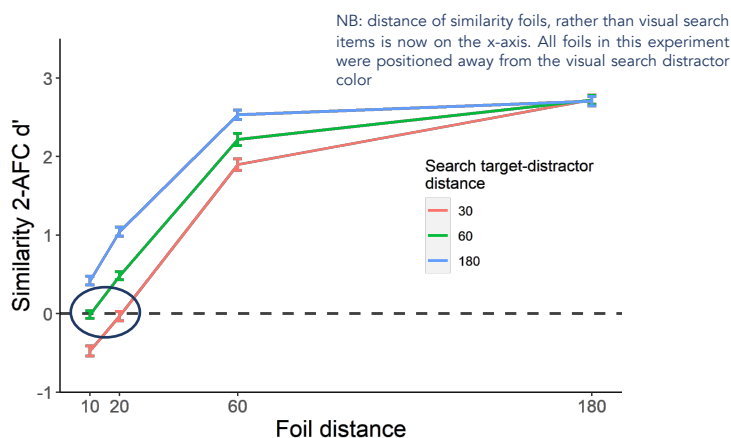
Colors in the similarity judgment task were selected such that the comparison was always between the target color (0°) and a foil that was 10° away, rotated towards or away from the distractor

Experiment 2: how does the bias change with distractor distance? (n = 30)



The bias peaked around 15-30°, but remained significant even when the visual search distractor was up to 90° away from the target color

Experiment 3: how broadly does the bias affect similarity judgments? (n = 50)



Performance improved as the foil was made more distinct from the target color. For two combinations of conditions, performance was at chance, suggesting the options were perceived as equally similar to the target

Conclusions

- Feature-based attention biases perception of target colors away from visual search distractors
- This is consistent with "off-tuning" to non-target features to maximize the discriminability between targets and distractors
- Attentional efficiency may come at a cost of less accurate perceptual representations

References

- Carrasco, Ling, & Read, 2004. *Nat Neuro*
- Scolarì & Serences, 2009. *J Neuro*
- Fuller & Carrasco, 2006. *Vis Research*
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Acknowledgments

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