

Feature-based attention warps perception of color

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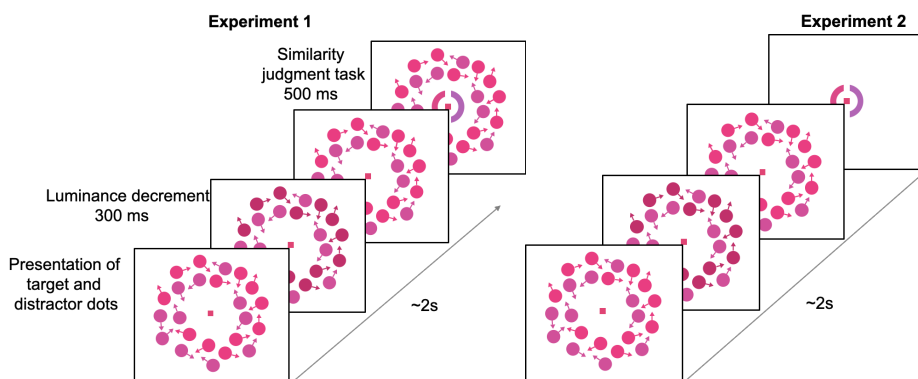
Background & Research Question



- Feature-based attention enhances processing of a particular feature over other, unattended features ^a.
- In spatial attention, there is evidence that locations nearby an attended region are perceived to be shifted away from the attended location (i.e. repulsion)^b.
- This suggests that spatial attention not only enhances perception, but also distorts position information of unattended information.

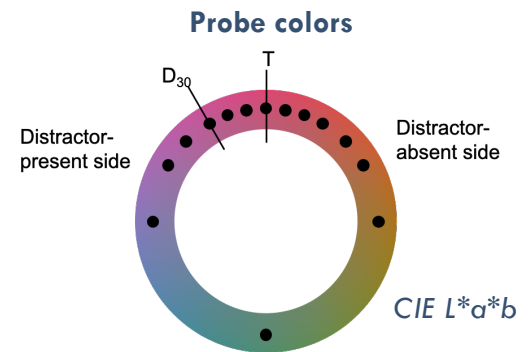
Does feature-based attention change the perception of colors, effectively warping feature space?

Methods: Participants performed two tasks on each trial



Feature-based attention task:

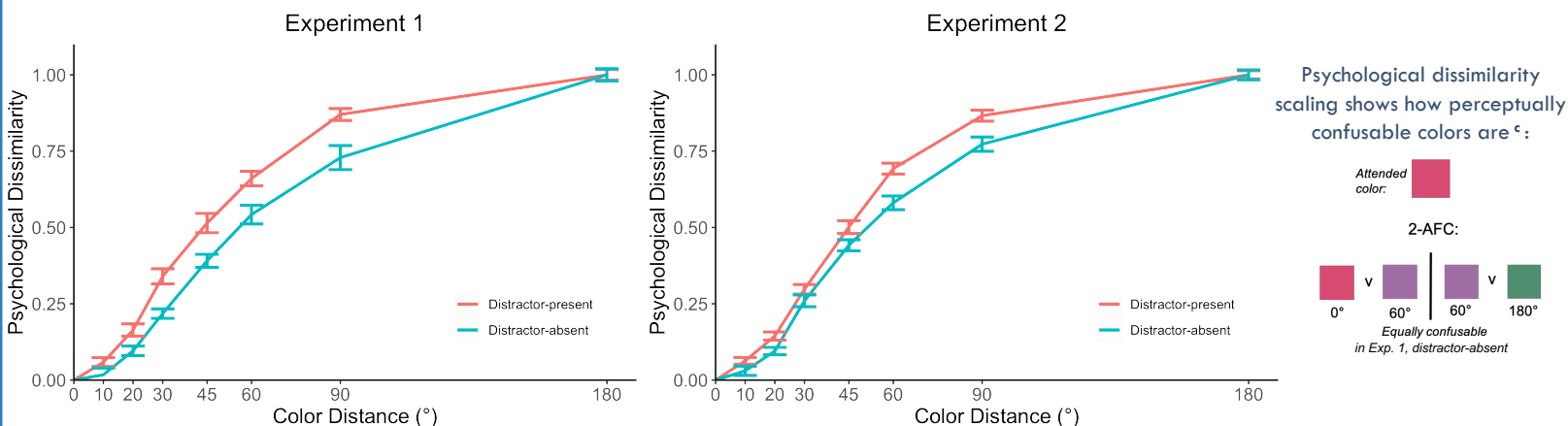
- Target colors chosen at random from color wheel
- Distractor color 30° away from target color
- Task: Detect a luminance decrement in the target color
- Participants thresholded to ~70% accuracy



Similarity-judgment task:

- Participants were asked to pick the color most similar to the target in a 2AFC task at the end of each trial
- Probe colors were 0°, 10°, 20°, 30°, 45°, 60°, 90°, and 180°, from both the distractor-present and distractor-absent side

Results: Feature-based attention warps color representations



Psychological dissimilarity functions reveal that colors nearby the distractor side are less confusable than colors on the opposite side.

Main effect of side of the color wheel: Experiment 1 (n = 20): $p < 0.01$; Experiment 2 (n = 30): $p < 0.001$; no interactions

Conclusion

Feature-based attention not only enhances representation of the target, but can distort the perception of colors throughout large parts of the feature space. This distortion may be a result of limited attentional resources.

References

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- Maloney, L. T., & Yang, J. N. (2003). Maximum likelihood difference scaling. *Journal of Vision*, 3(8), 5-5.