

Perceptual Comparisons Induce Various Forms of Memory Updating

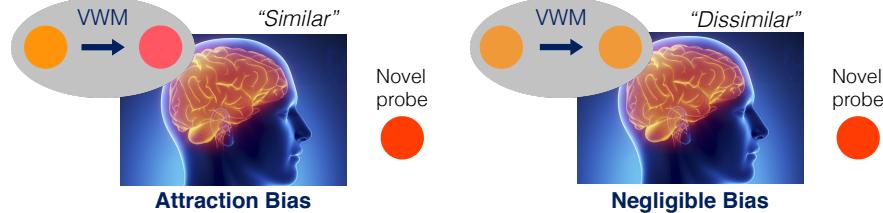
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BACKGROUND

Recent work shows that visual working memory (VWM) representations can be distorted after perceptual comparisons with novel visual inputs that are perceived as similar.*

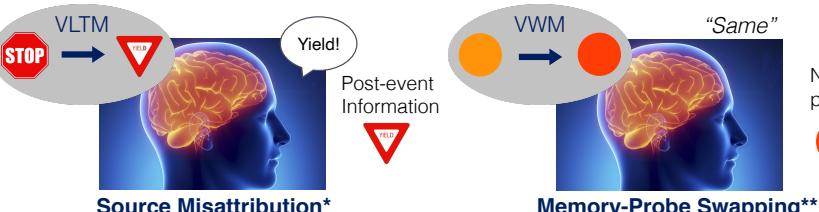


These findings suggest that endorsing similarity between VWM representations and novel inputs triggers **integration** between the two representations.

*See *Working Memory Content is Distorted by Its Use in Perceptual Comparisons* (Fukuda et al., 2020)

RESEARCH QUESTION

What other forms of **memory updating** can be explained by using visual memories in perceptual comparisons?

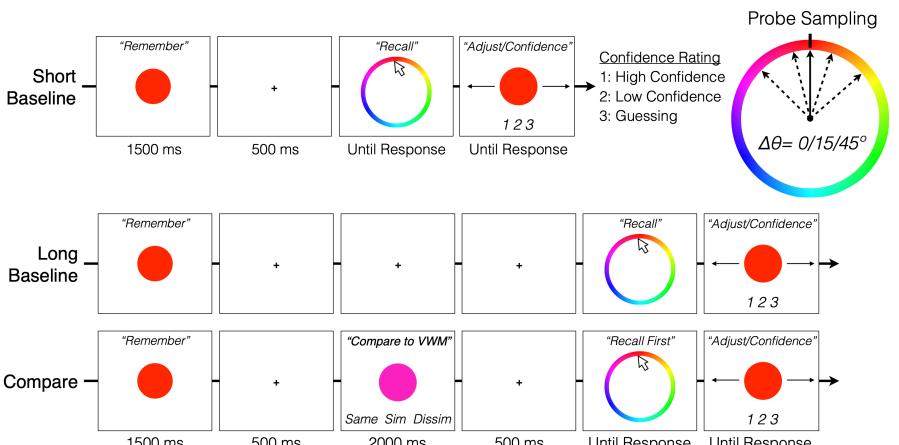


Perceiving **shared identity** or **"sameness"** between memories and novel inputs triggers **swapping** between memories and novel items.

*See *Reconstruction of automobile destruction: An example of the interaction between language and memory* (Loftus & Palmer, 1974)

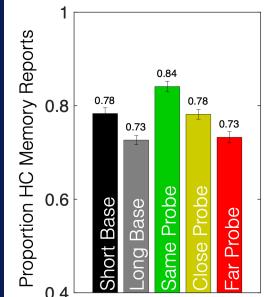
**See *The precision of visual working memory is set by allocation of a shared resource* (Bays, Catalao & Husain, 2009)

METHODS

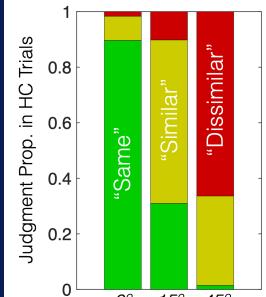


RESULTS

Perceived v. Physical Similarity

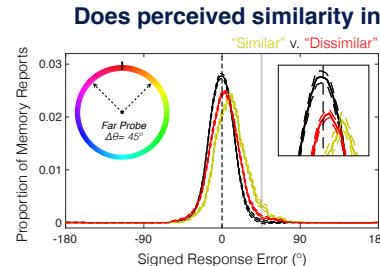


High confidence when...
(1) Short delay
(2) Same probe



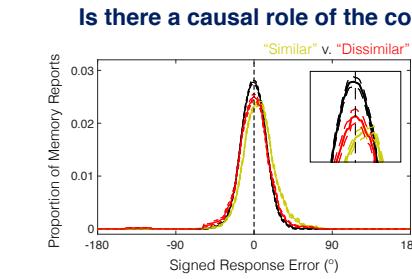
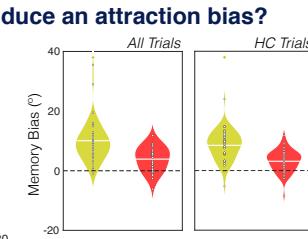
Perceived & physical similarity were correlated
But not perfect...

How is bias influenced by subjective judgement & physical distance?



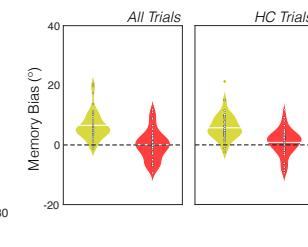
Perceived 'similarity' results in larger attraction bias than perceived 'dissimilarity', replicating our previous experiments.

Does perceived similarity induce an attraction bias?



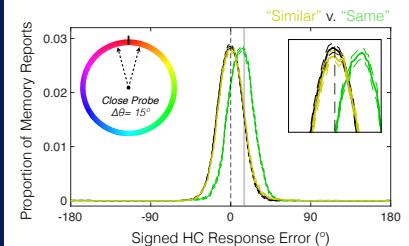
Perceptual comparisons modulate memory biases above and beyond the effects of the physical similarity.

Is there a causal role of the comparison in memory bias?



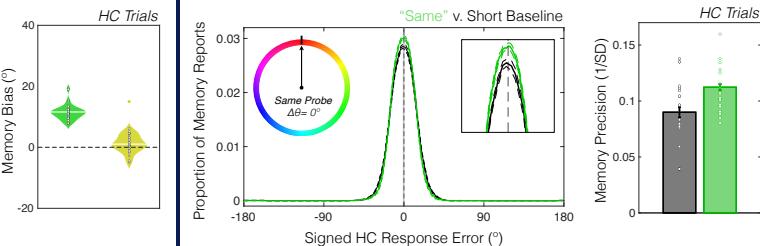
Does perceiving shared identity between memories & visual inputs induce memory change?

Effect of mistakenly perceiving shared identity?



Falsely perceiving shared identity resulted in larger distortions than perceiving similarity, may indicate **Memory-Probe Swapping**.

Effect of correctly perceiving shared identity?



Correctly perceiving shared identity **improved** memory precision, potentially via selection of the more precise representation.

DISCUSSION

- Perceptual comparisons play a **causal role in VWM distortion** & may induce **different types of distortion**
- When new inputs were perceived as similar, a bias was induced. However, when perceived as the same, the distortion was **much larger**, potentially reflecting memory-probe swapping
- Endorsing identical inputs as the "same" improved VWM precision, suggesting that memory outcomes **depend on judgment accuracy**