

Judgments During Perceptual Comparisons Predict Distinct Forms of Memory Updating

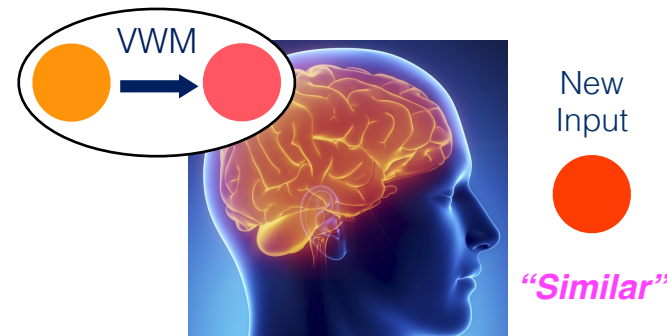
Joseph M. Saito¹, Gi-Yeul Bae², & Keisuke Fukuda^{1,3}

¹University of Toronto, ²Arizona State University, ³University of Toronto Mississauga

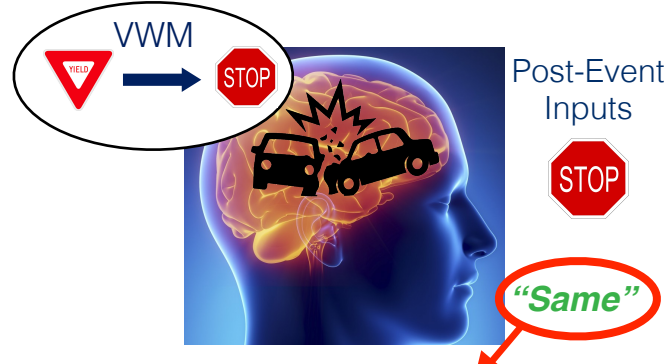
Background

Visual working memory (VWM) allows one to use prior perceptual experiences to accomplish current tasks.

However, VWMs can be **systematically biased** during perceptual comparisons when new inputs are **perceived as similar**:



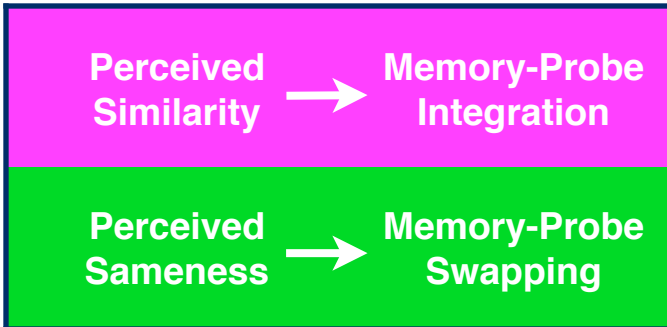
But what about memory distortions that are **not easily explained by bias**?



Perceived sameness triggers swapping?

Hypothesis

Qualitatively **different judgments** during perceptual comparisons predict qualitatively **different types of memory updating**



Fukuda, K., Pereira, A.E., Saito, J.M., Tang, T.Y., Tsubomi, H., & Bae, G.Y. (in press). Working memory content is distorted by its use in perceptual comparisons.

Loftus, E.F., Miller, D.G., & Burns, H.J. (1978). Semantic integration of verbal information into a visual memory.

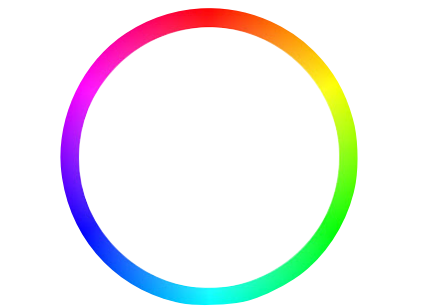
Saito, J.M., Kolinsky, M., & Fukuda, K. (2020). Perceptual comparisons modulate memory biases induced by overlapping visual input.

Tousignant, J.P., Hall, D., & Loftus, E.F. (1986). Discrepancy detection and vulnerability to misleading postevent information.

Zaragoza, M.S., & Lane, S.M. (1994). Source misattributions and the suggestibility of eyewitness memory.

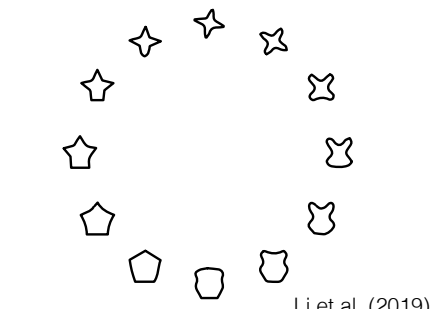
Stimuli

Circular Color Space



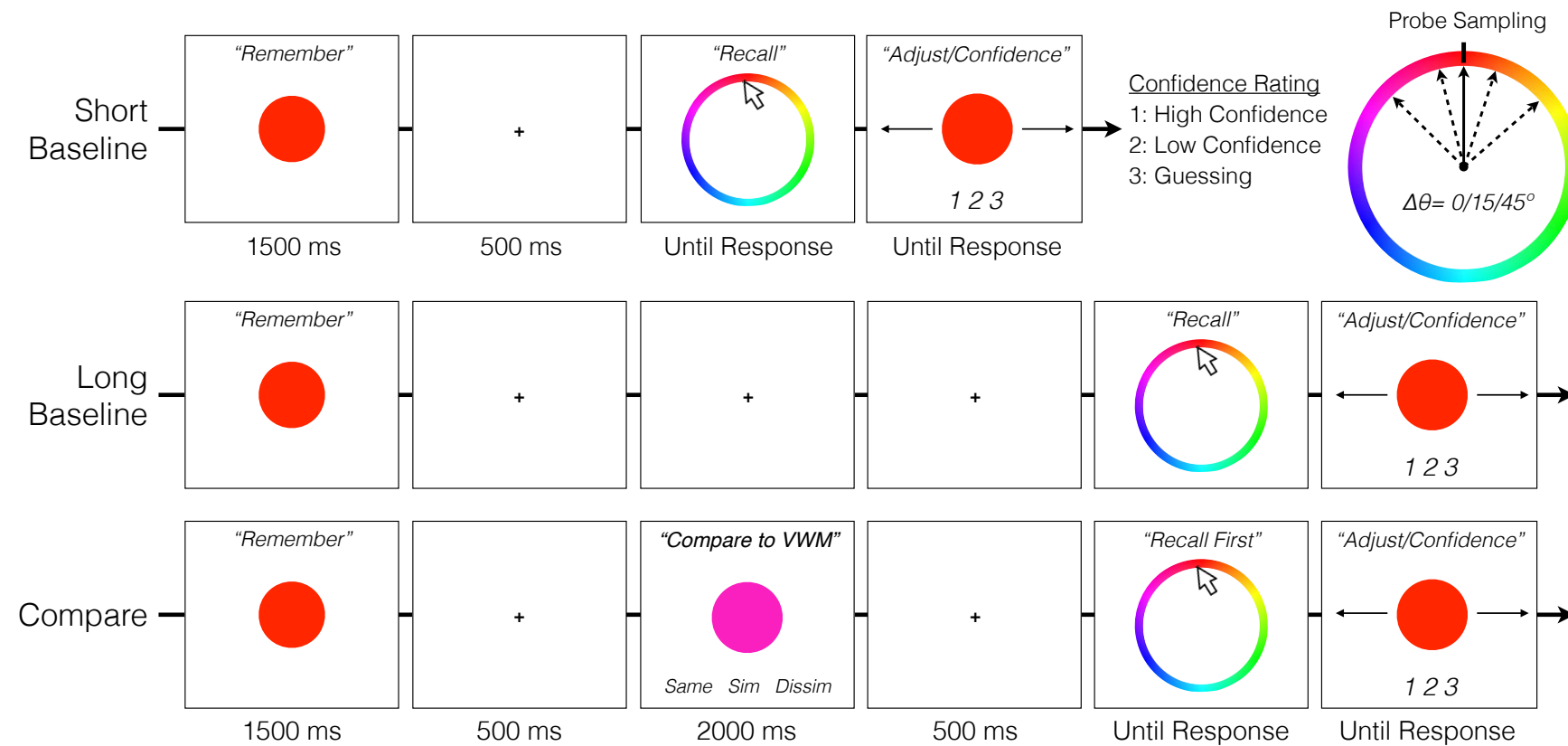
Zhang & Luck (2008)

Circular Shape Space

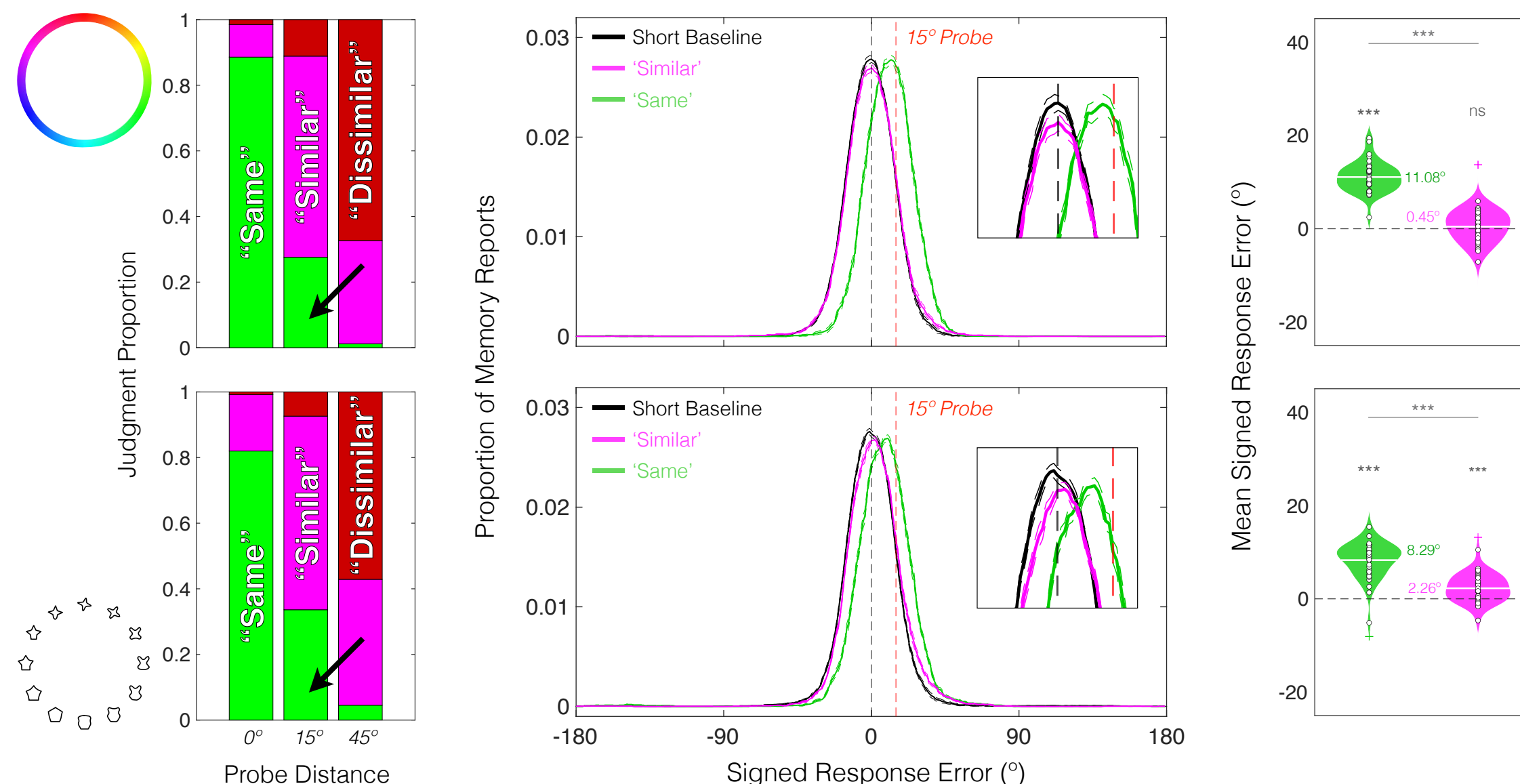


Li et al. (2019)

Task Procedure



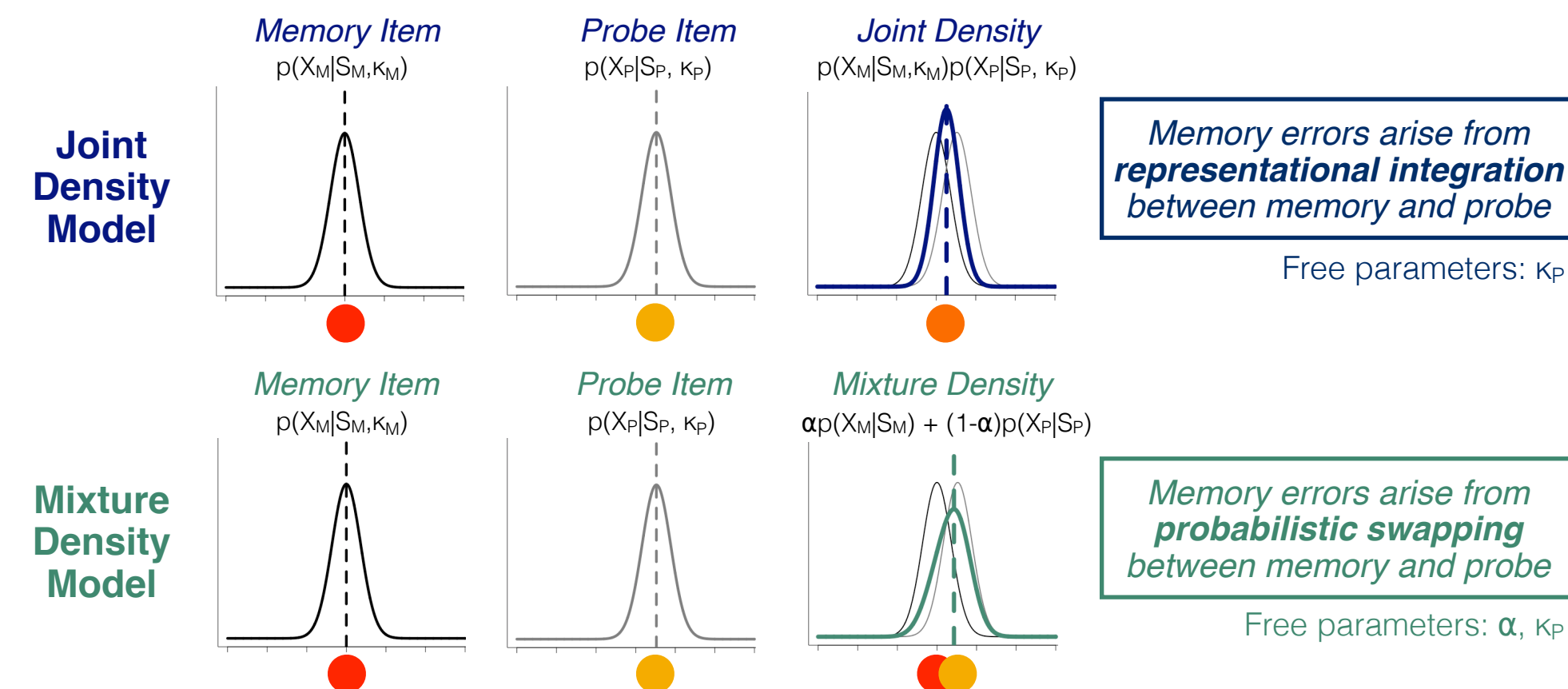
Do differences in perceived overlap result in different sized memory errors?



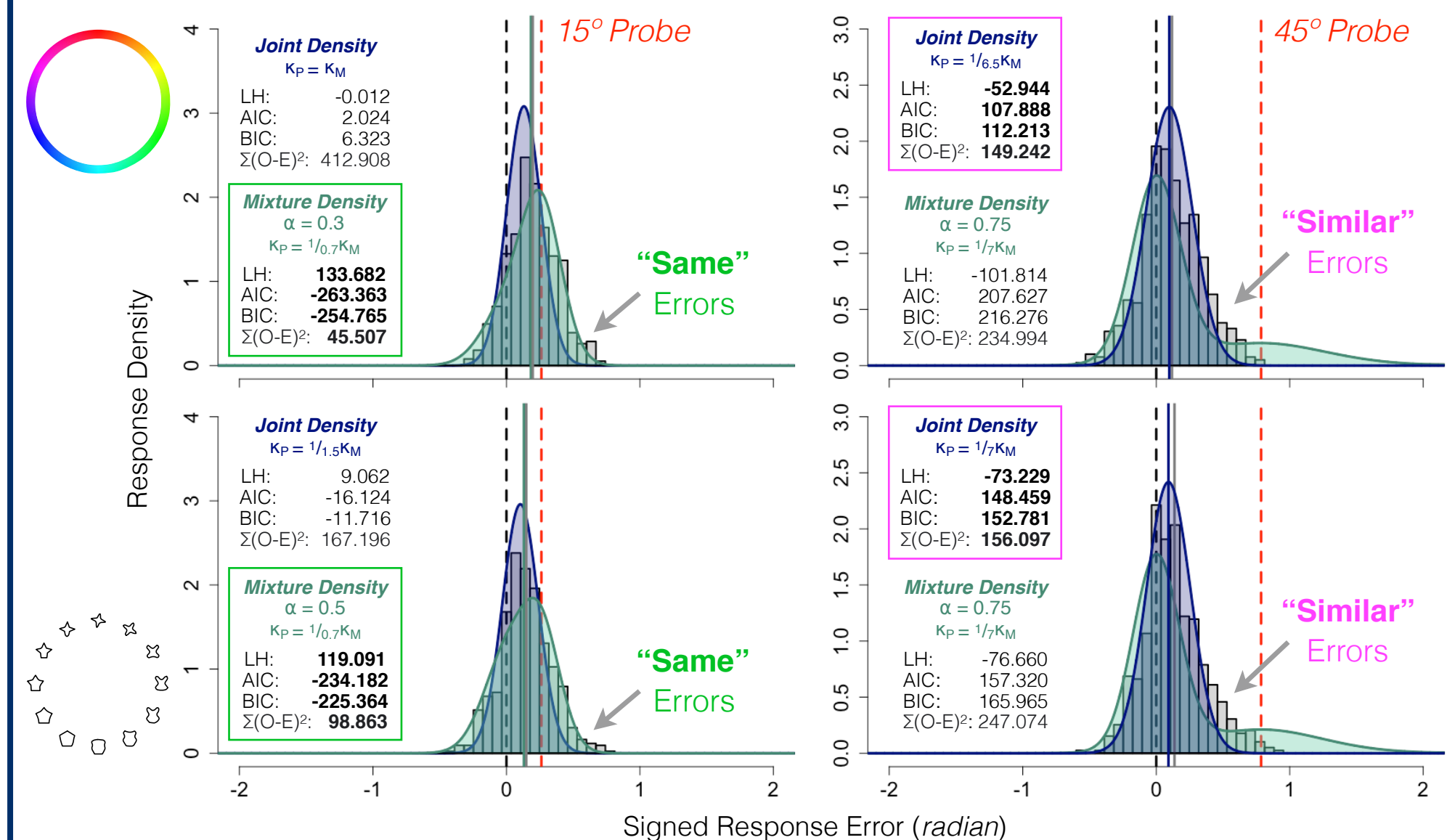
Participants frequently **perceived 15° probes to be the 'same'**

Differences in error magnitude between 'same' & 'similar' judgments are consistent with distinct updating mechanisms

Computational Modelling of Memory Errors



Are differences in memory errors due to different updating mechanisms?



Perceived **sameness** triggers memory-probe **swapping**

Perceived **similarity** triggers memory-probe **integration**