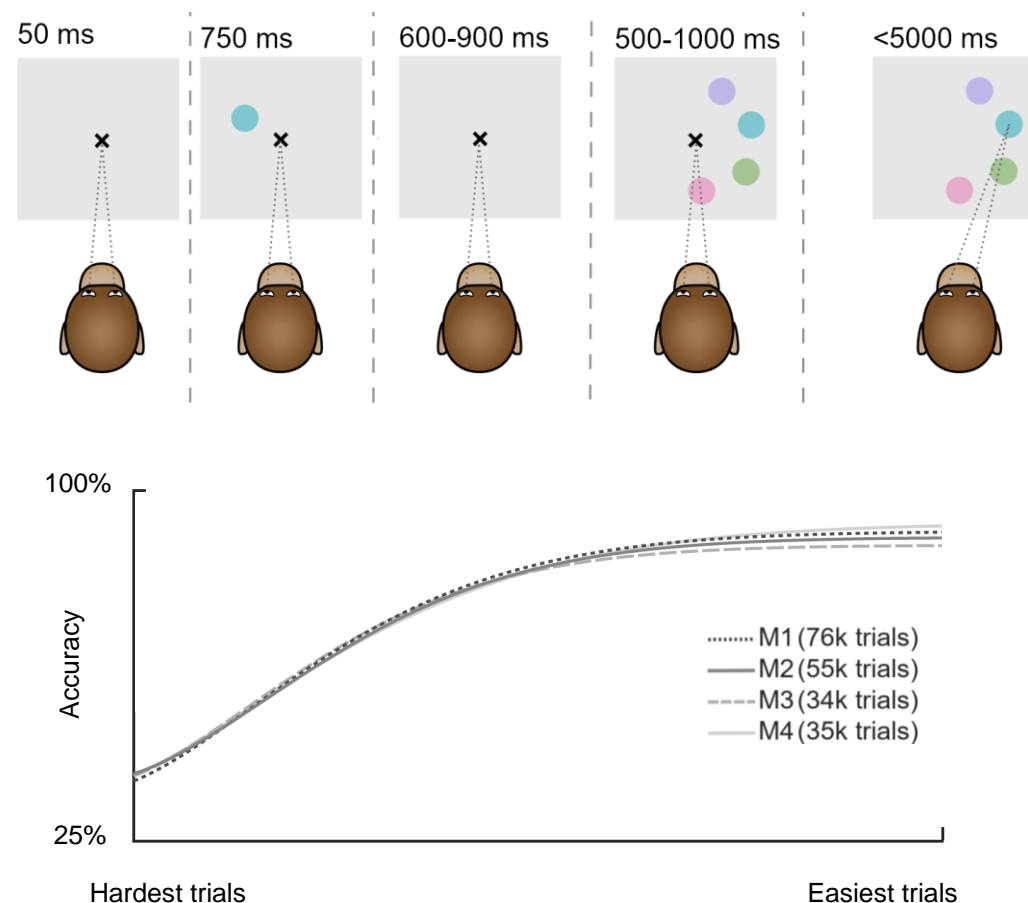
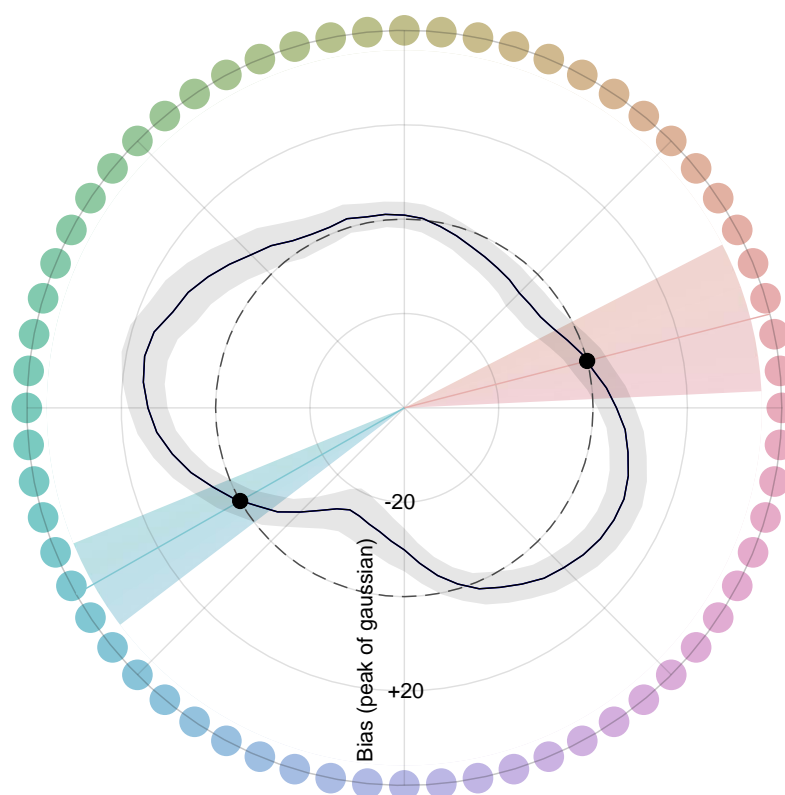


- Color is used extensively in the study of working memory.
- Bae+ (2015) showed there were biases in remembering colors over short timescales and interpreted these as evidence of color categories.
- Their approach provides a non-linguistic test of color categories which can be used in trichromatic monkeys.

Color categories in monkeys



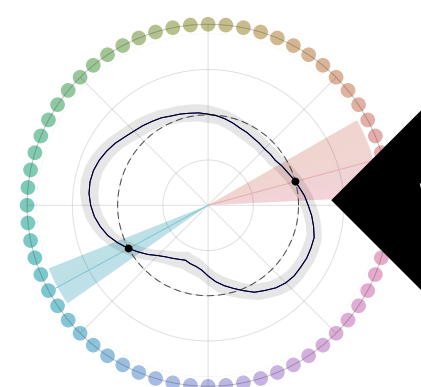
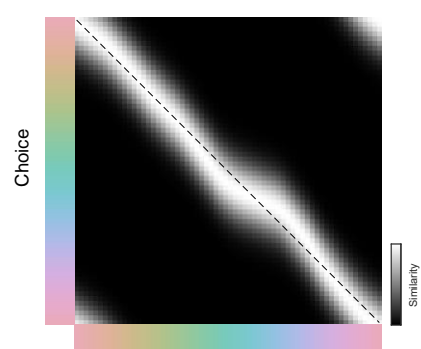
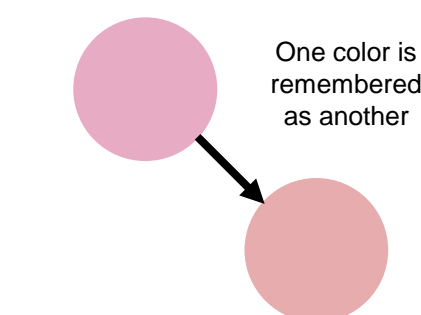
Mixture modelling results in 2 attractor points for data combined across animals:



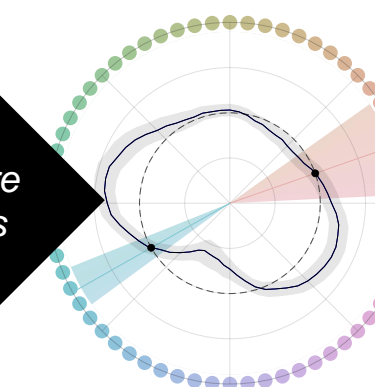
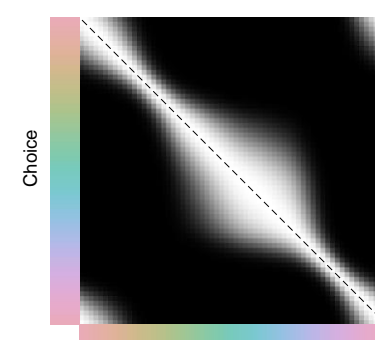
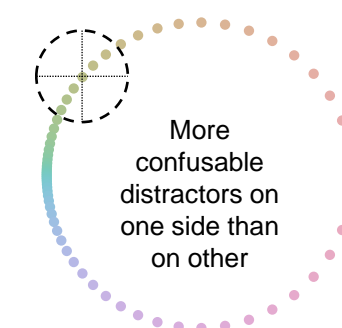
Theory and Simulations:

We identify two distinct potential sources of bias

1. Cognitive Bias:

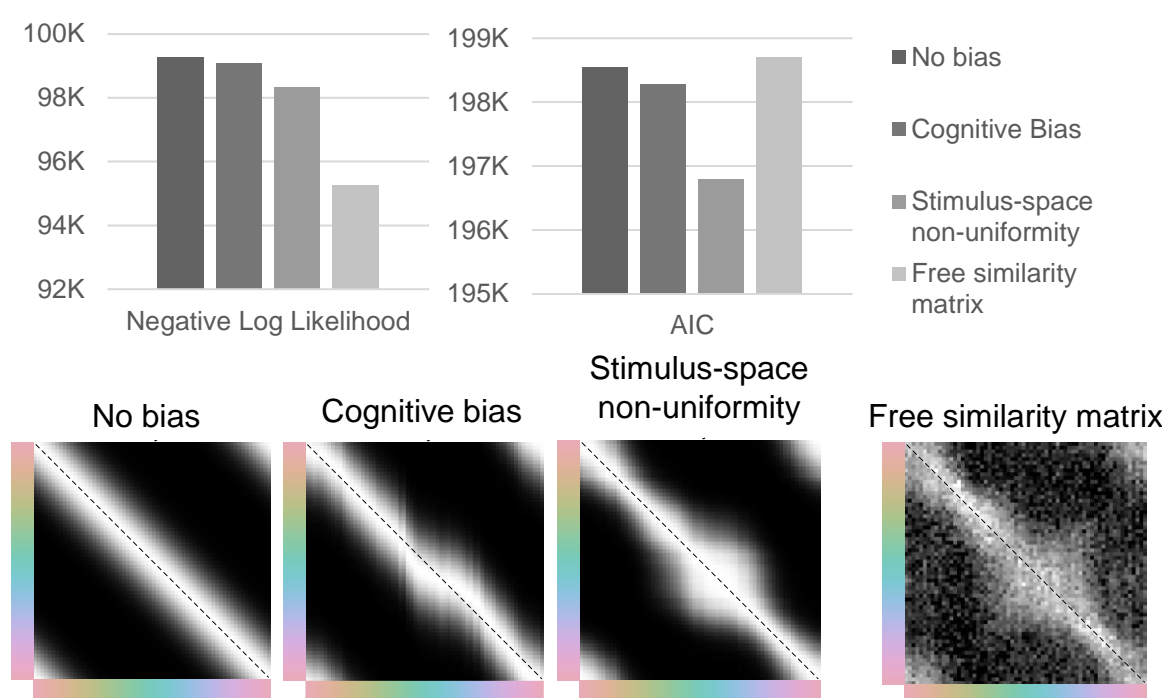


2. Stimulus-Space Non-uniformity:

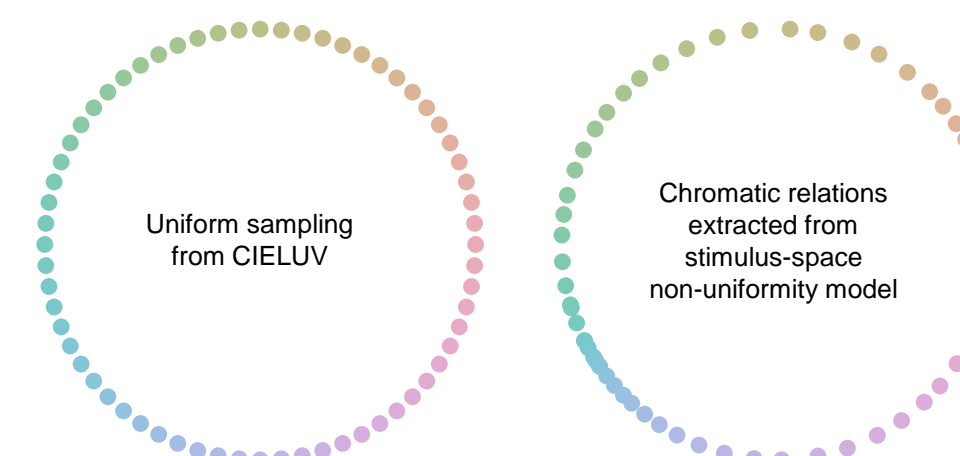


Similar mixture model results

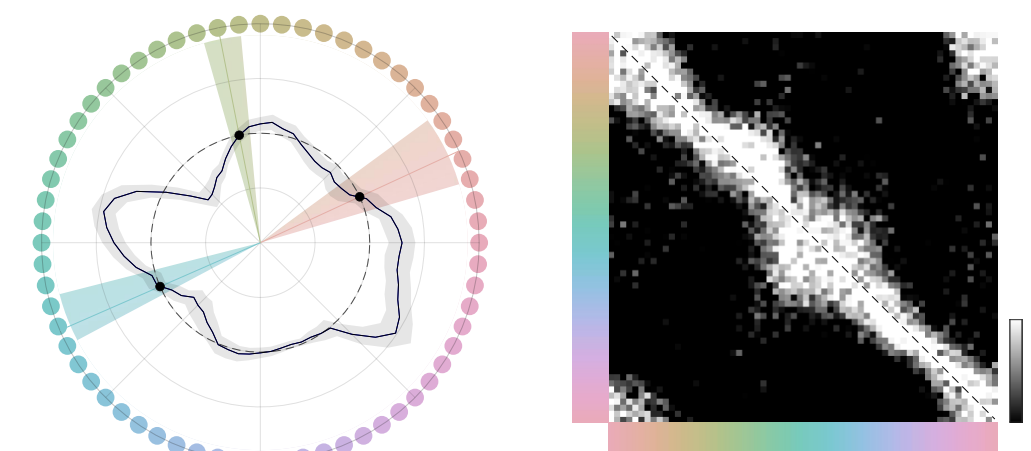
Data: fitting generative models



A behaviorally-derived uniform colorspace



Individual differences: M2's yellow is a (one-sided) cognitive bias



Conclusions:

- There are two attractor points found in all monkeys
- These correspond roughly to the human warm and cool
- At the group level, the attractors are explained by non-uniformity in the stimulus-space
- At the individual level, some animals show more than the two common attractor points
- Idiosyncratic attractors appear to be explained by cognitive biases
- We have developed a method to distinguish sources of bias
- The behavioral data can be used to reconstruct a colorspace that is free from stimulus-space non-uniformities

Bibliography:

- Bae, G.-Y., Olkkonen, M., Allred, S. R., & Flombaum, J. I. (2015). Why some colors appear more memorable than others: A model combining categories and particulars in color working memory. *Journal of Experimental Psychology: General*, 144(4), 744–763. <https://doi.org/10.1037/xge0000076>
- Schurgin, M. W., Wixted, J. T., & Brady, T. F. (2020). Psychophysical scaling reveals a unified theory of visual memory strength. *Nature Human Behaviour*, 4(11), 1156–1172. <https://doi.org/10.1038/s41562-020-00938-0>