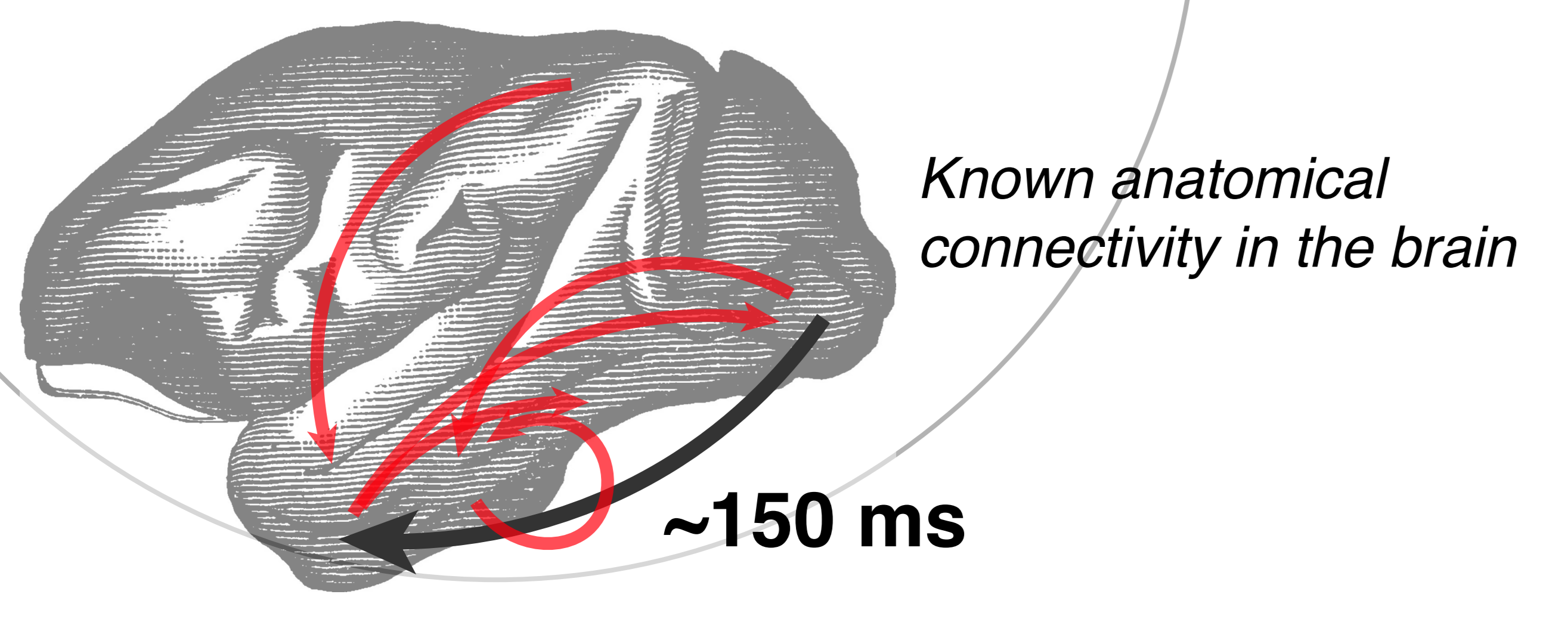


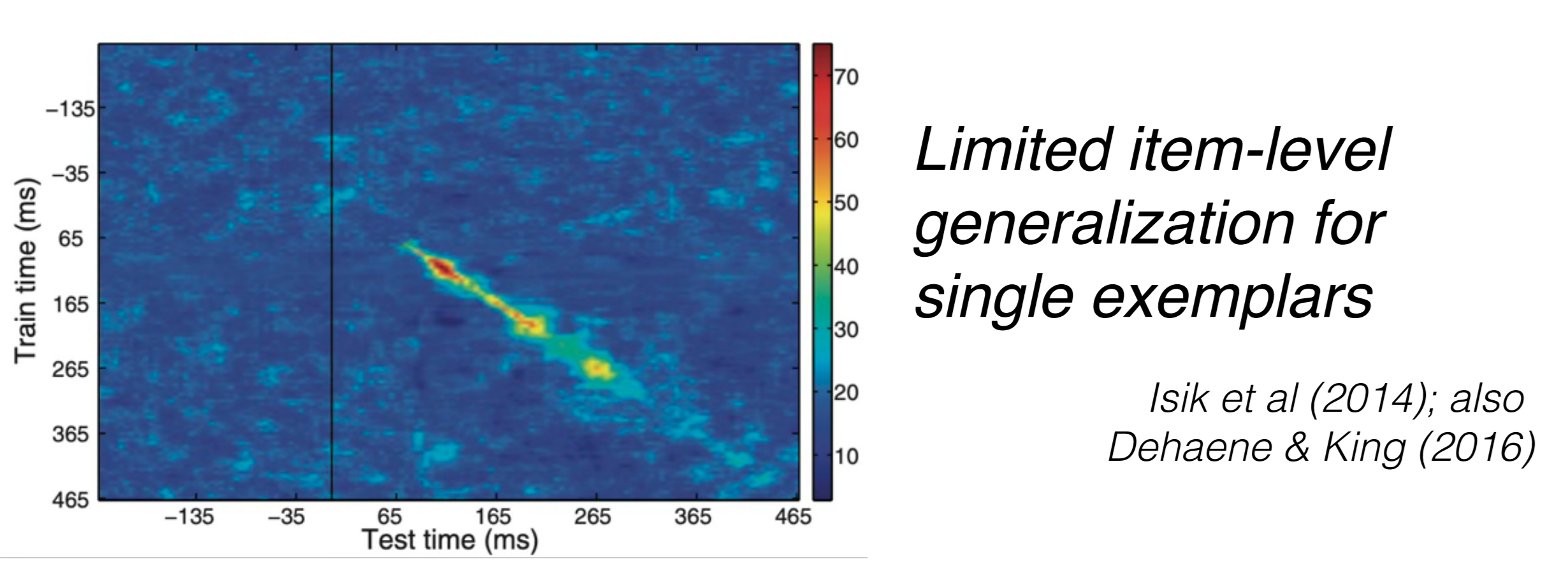
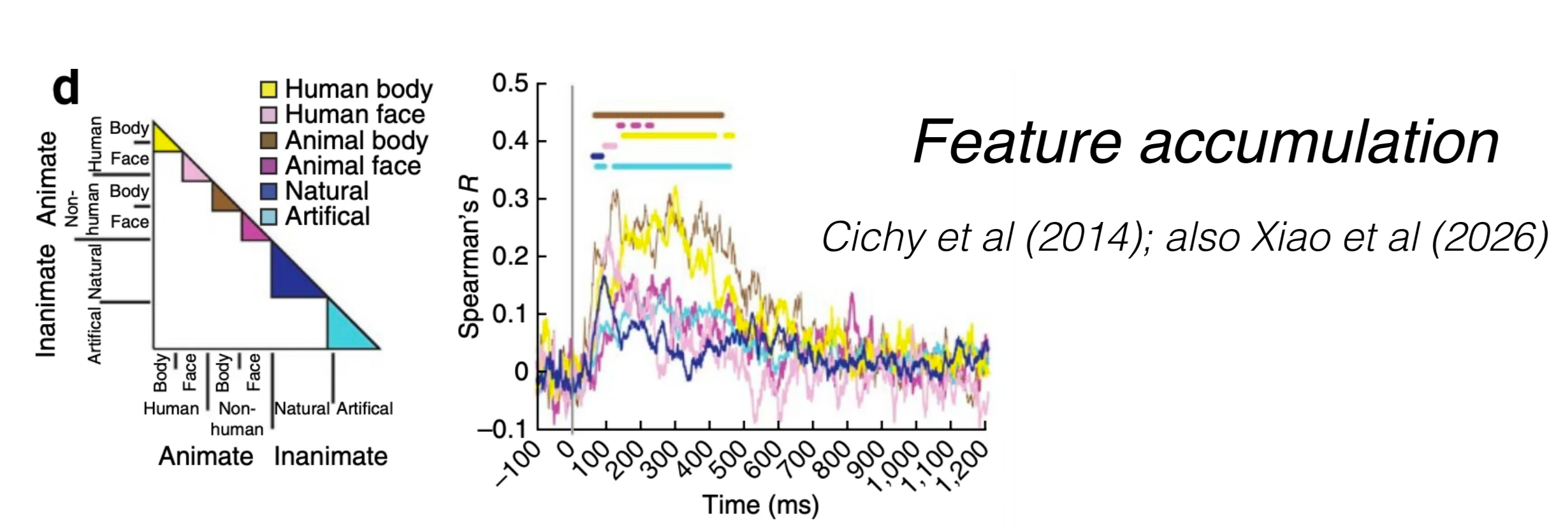
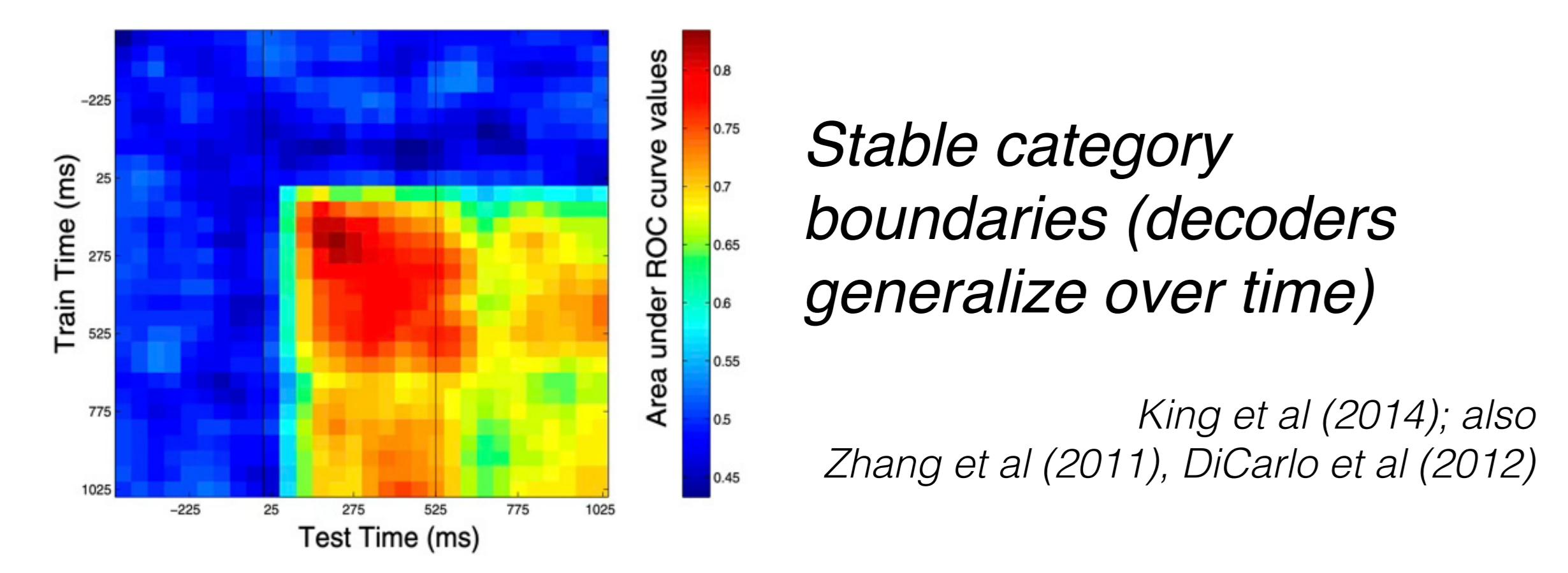
# Representational dynamics in inferotemporal cortex depends on image-manifold scale

Ammar I Marvi, Jacob S Prince, George A Alvarez, Talia Konkle  
Harvard University

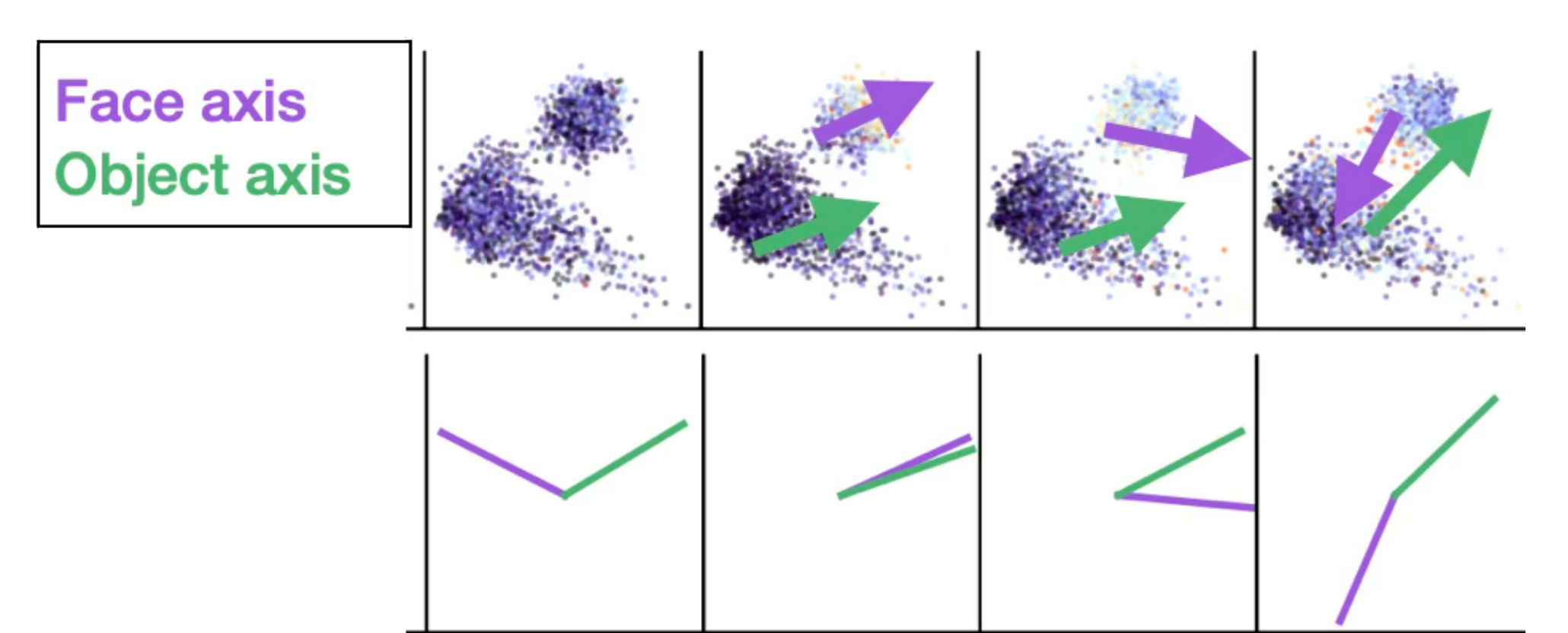
## BACKGROUND



## Spectrum of empirical results...

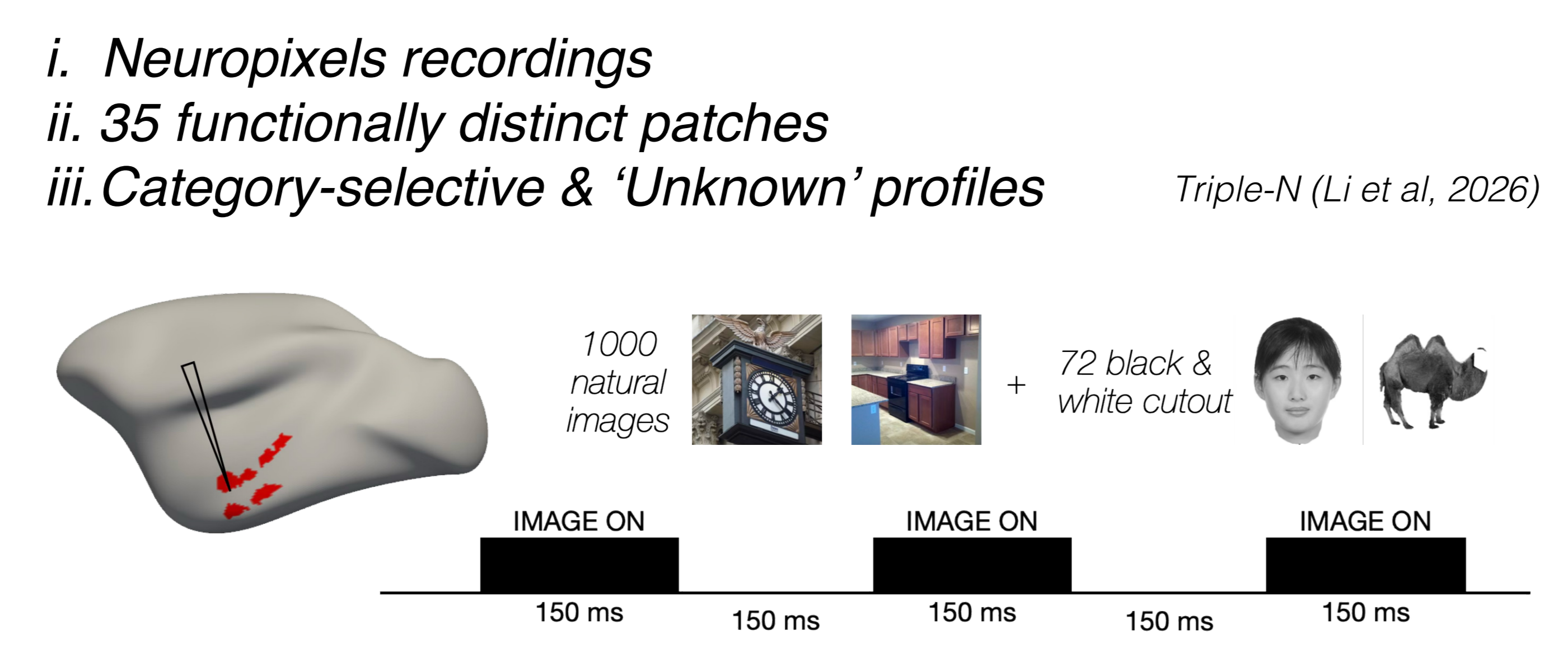


### Rapid shifts in tuning axes

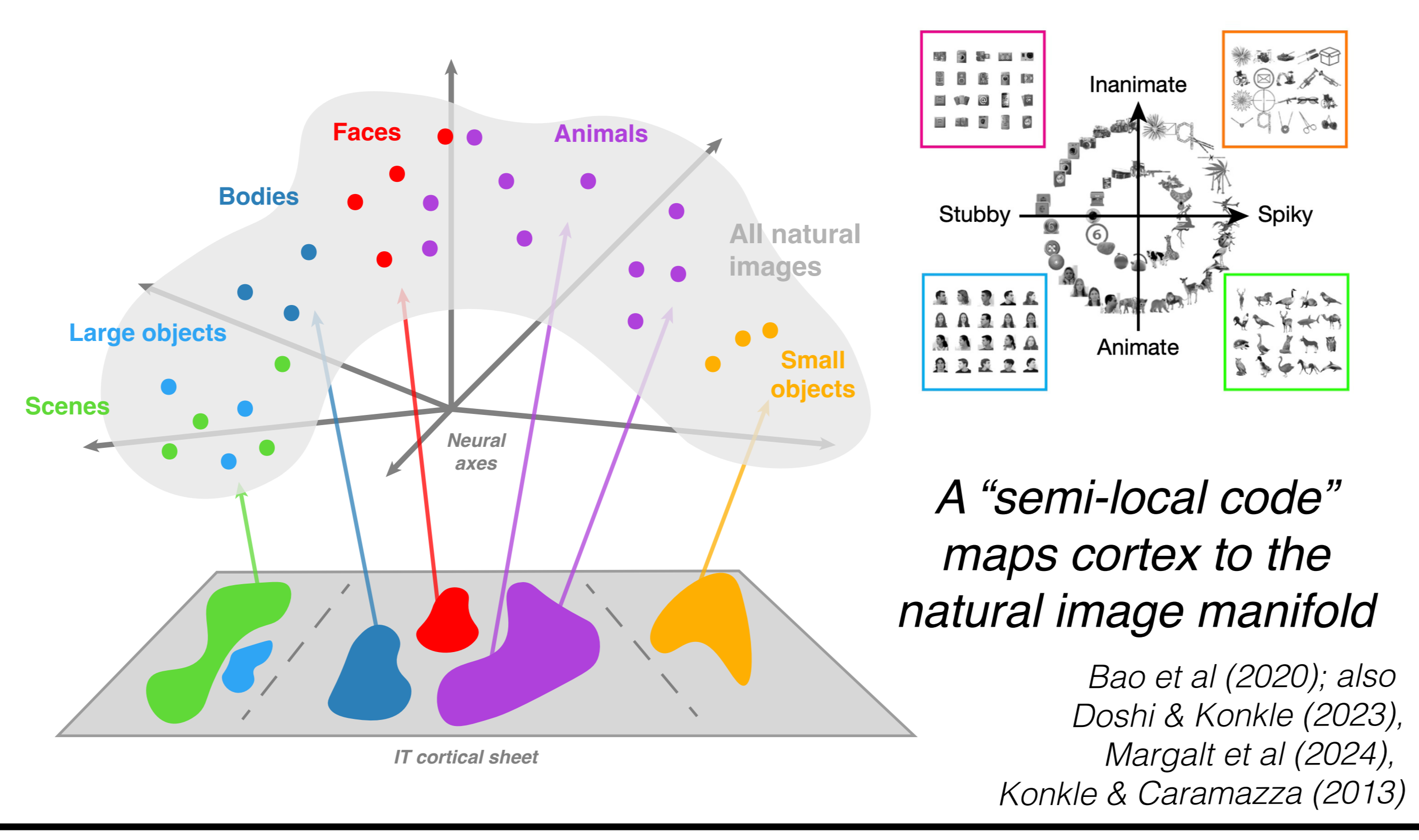


Shi et al (2026); also She et al (2024), Anthes et al (2026), Kietzmann et al (2019)

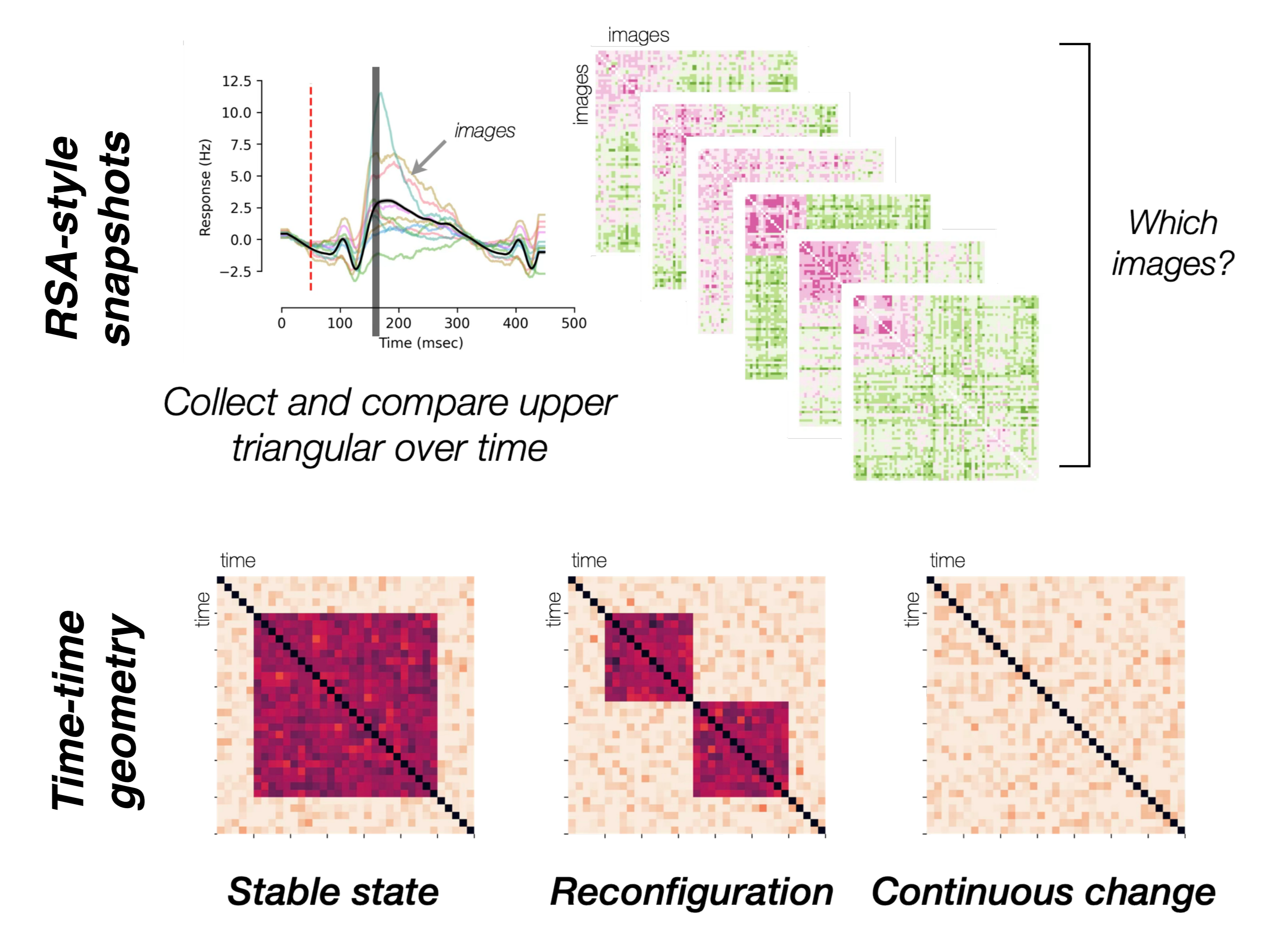
## DATASET



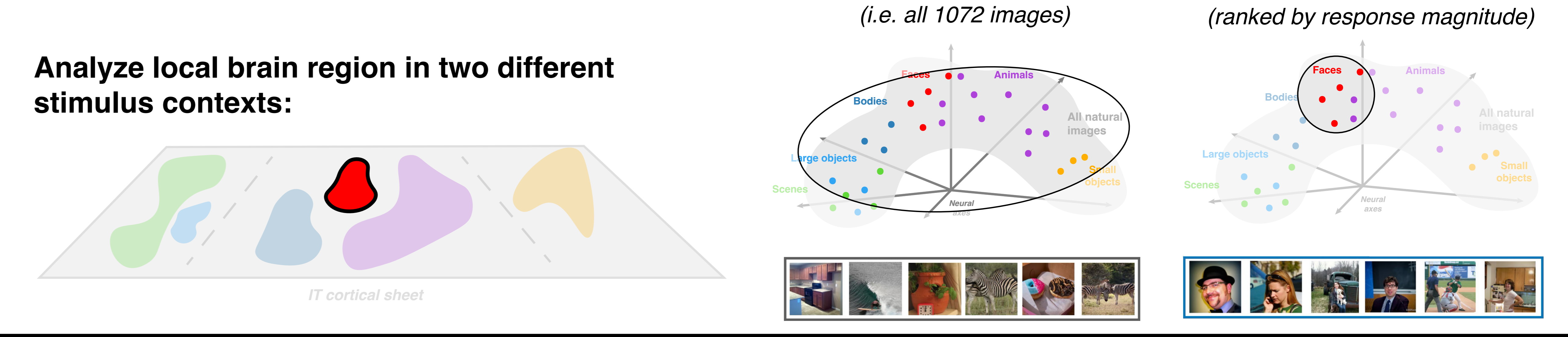
## TOPOGRAPHIC NEURAL CODE



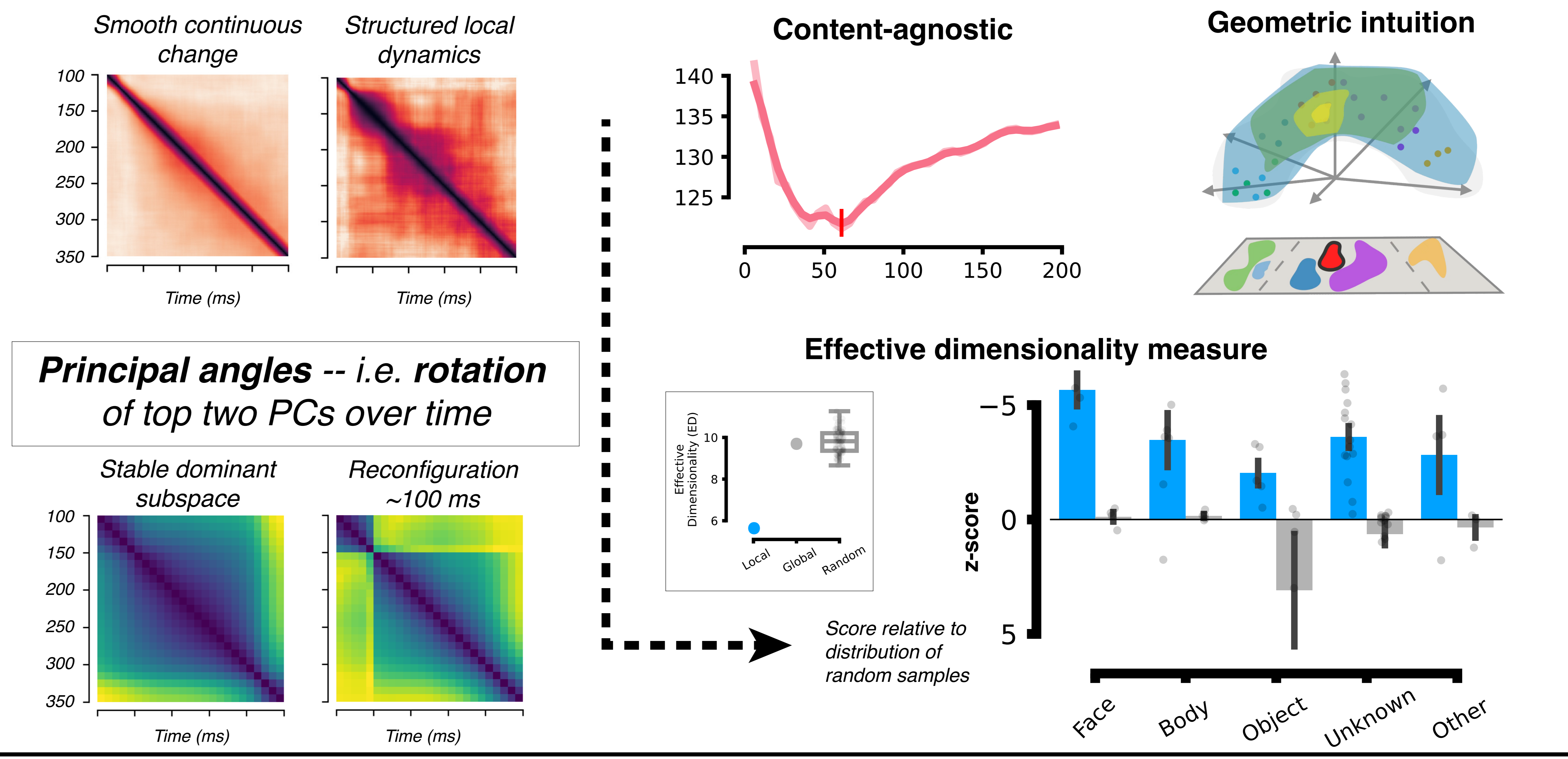
## TEMPORAL DISSIMILARITY



## CONCEPTUAL FRAMEWORK



## RESULTS



## SUMMARY

- i. Image-manifold scale reveals **distinct dynamical regimes**
- ii. Preferred images show **structured, low-dimensional reconfiguration**
- iii. Global construct of image space remains **broadly stable**

1. Xiao, W., Vriken, K. & Livingstone, M. S. Response dynamics in macaque ventral stream recapitulate the visual hierarchy. Preprint at <https://doi.org/10.1101/2025.11.11.686115> (2025).  
2. She, L., Berna, M. K., Shi, Y., Fusi, S. & Tsao, D. Y. Temporal multiplexing of perception and memory responses in IT cortex. *Nature* 629, 861–868 (2024).  
3. Li, Y. et al. Triple-Y Dataset: Non-human Primate Neural Responses to Natural Scenes. *arXiv*.  
4. Cichy, R. M., Plantz, D. & Oliva, A. Resolving human object recognition in space and time. *Nat Neurosci* 17, 455–462 (2014).  
5. Isik, L., Meyers, E. M., Lelko, J. Z. & Poggio, T. The dynamics of invariant object recognition in the human visual system. *Journal of Neurophysiology* 111, 91–102 (2014).  
6. Dehaene, S. & King, J.-R. Decoding the Dynamics of Conscious Perception: The Temporal Generalization Method. in *Micro-, Meso- and Macro-Dynamics of the Brain* (eds Buzsáki, G. & Christen, Y.) 85–97 (Springer International Publishing, Cham, 2016). doi:10.1007/978-3-319-28802-4\_7.  
7. Shi, Y. et al. Rapid concerted switching of the neural code in the inferotemporal cortex. *Nature* <https://doi.org/10.1038/s41586-026-10267-3> (2026) doi:10.1038/s41586-026-10267-3.  
8. Prince, J. S., Alvarez, G. A. & Konkle, T. Contrastive learning explains the emergence and function of visual category-selective regions. *Science Advances* (2024).  
9. Margalt, E. et al. A unifying framework for early and higher ventral visual cortex. *Neuron* 112, 2433–2451.e7 (2024).  
10. Doshi, F. R. & Konkle, T. Cortical topographic motifs emerge in a self-organized map of object space. *Sci. Adv.* 9, eade8187 (2023).  
11. Bao, P., She, L., McGill, M. & Tsao, D. Y. A map of object space in primate inferotemporal cortex. *Nature* 583, 103–108 (2020).  
12. Konkle, T. & Caramazza, A. Tripartite Organization of the Ventral Stream by Animacy and Object Size. *Journal of Neuroscience* 33, 10235–10242 (2013).