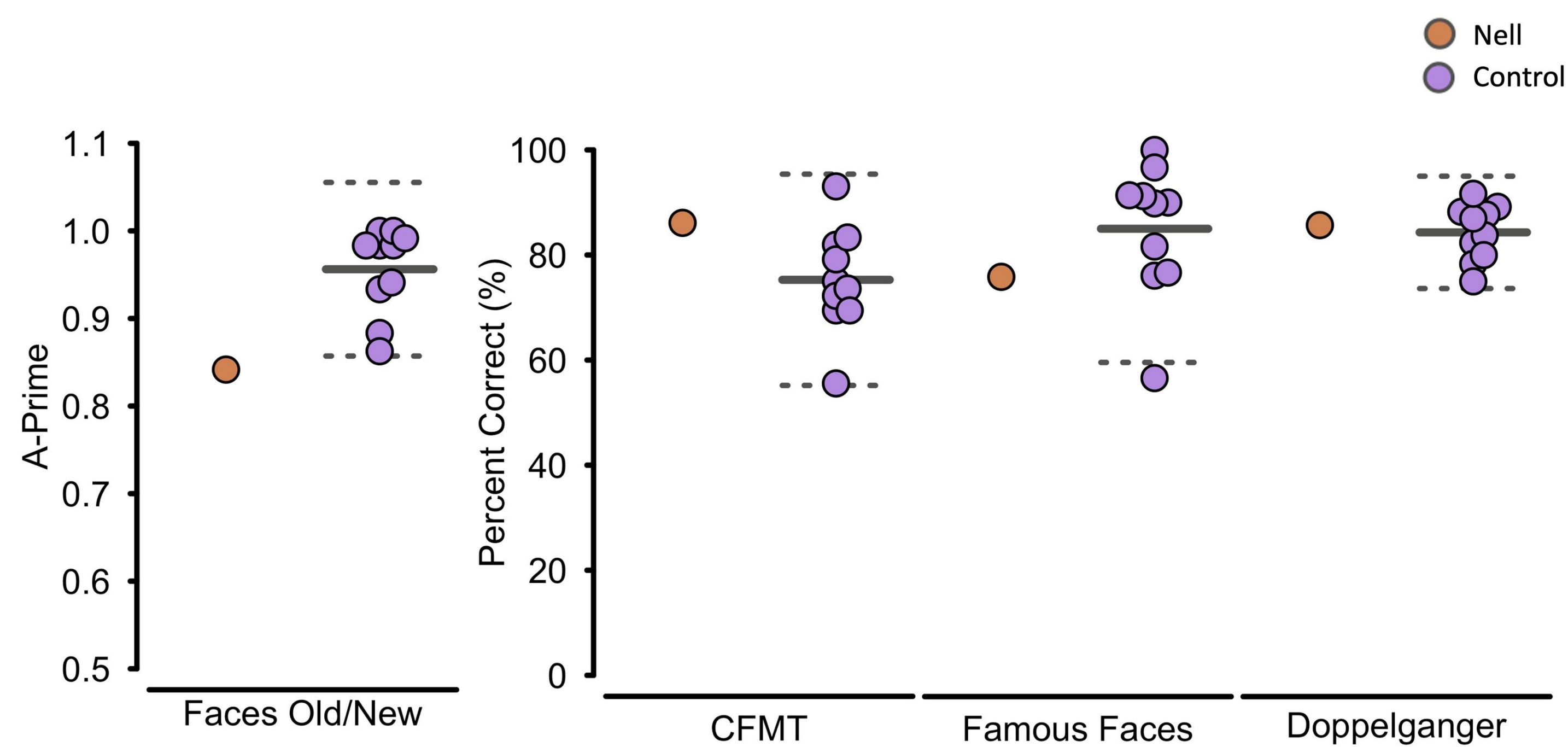


Hyperfamiliarity for faces enhances functional connectivity between visual and non-visual regions of the brain during natural viewing

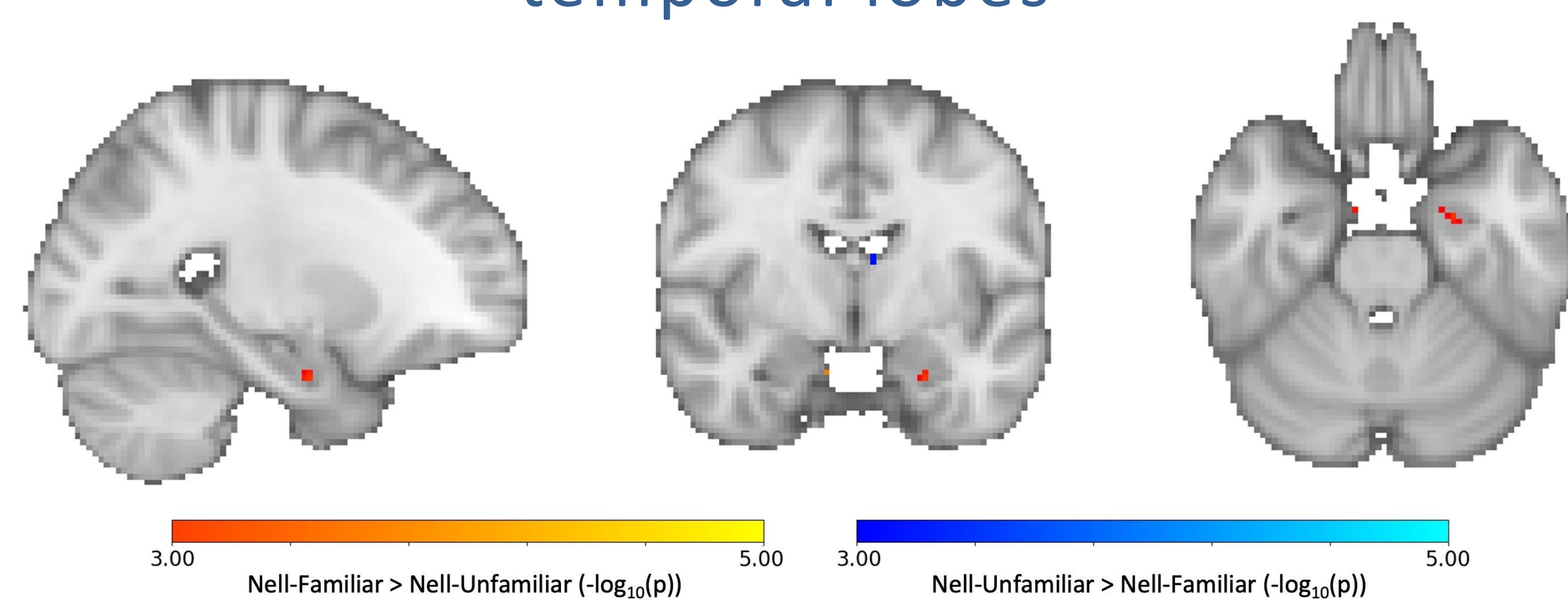
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Introduction

Hyperfamiliarity for faces (HFF) is a rare condition in which unfamiliar faces are mistakenly experienced as familiar. This phenomenon offers a unique window into the neural mechanisms underlying familiar face perception. In this study, we used a naturalistic movie-viewing paradigm to compare brain responses between participants who were either familiar or unfamiliar with the actors. We then examined how these patterns relate to a person (Nell) with HFF. Specifically, we asked whether HFF responses resemble those of familiar viewers in core (visual) or extended (non-visual) face processing regions, and whether connectivity between these regions supports the experience of familiarity.

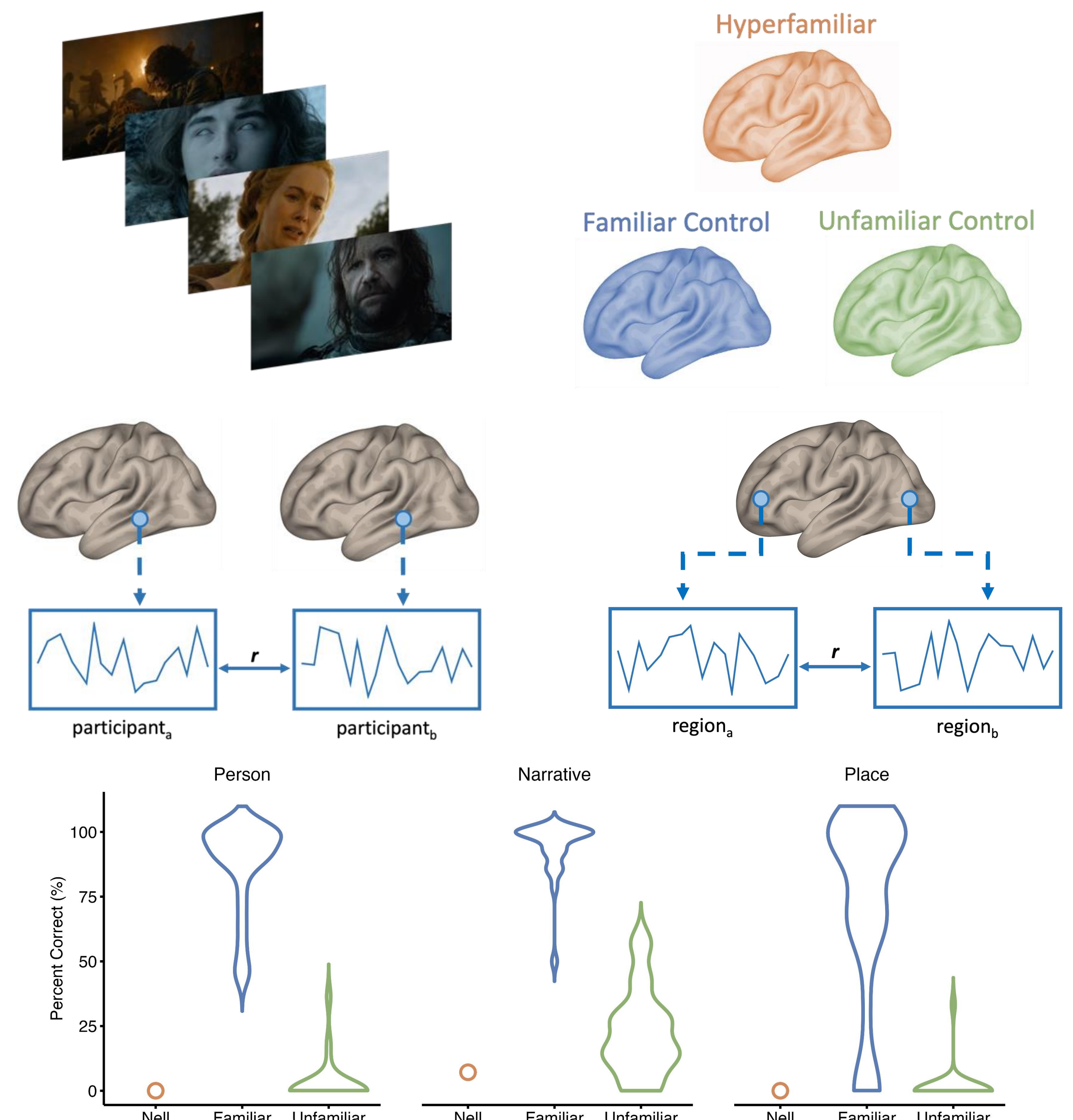


Neural correlates of HFF in the medial temporal lobes

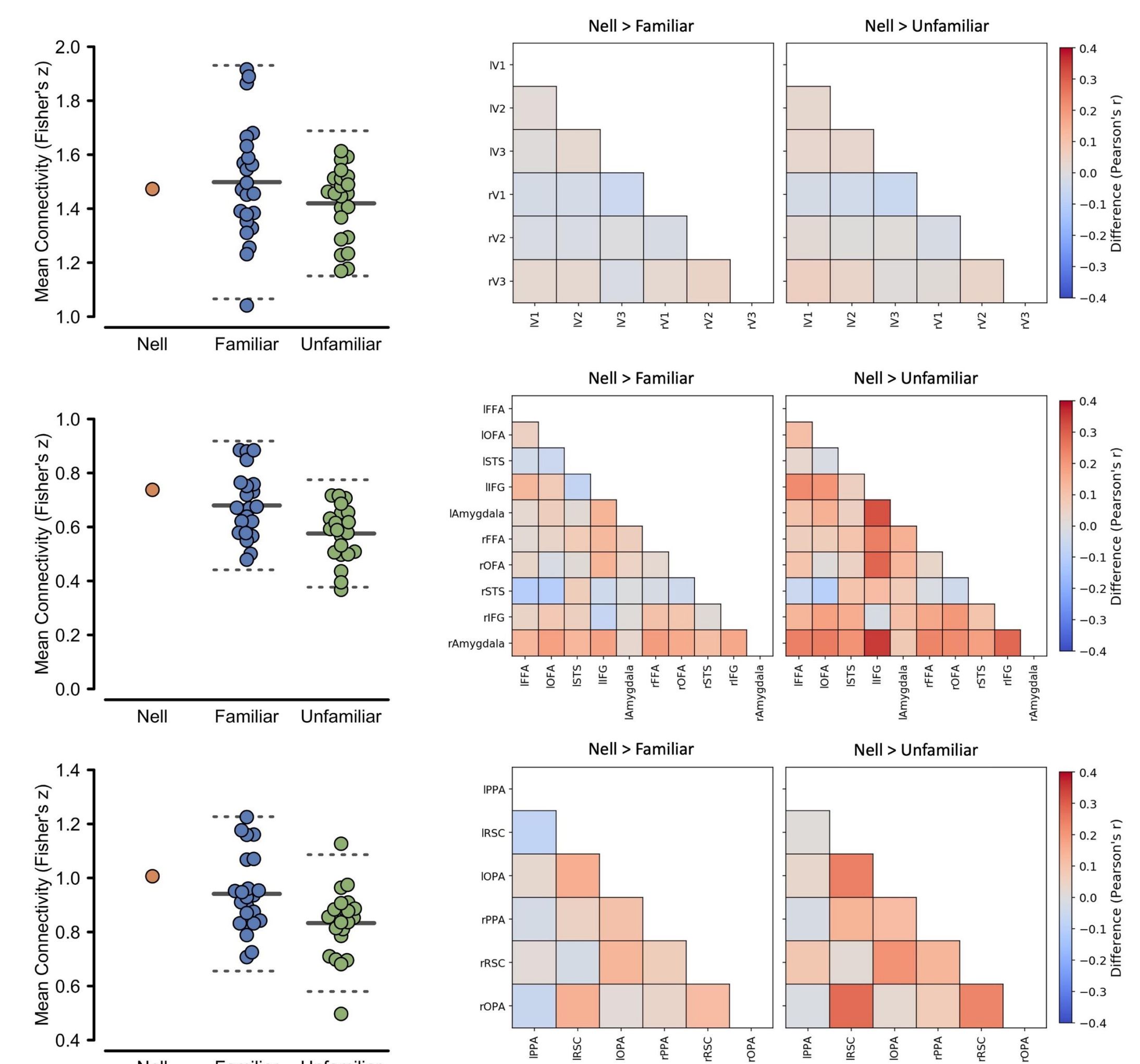
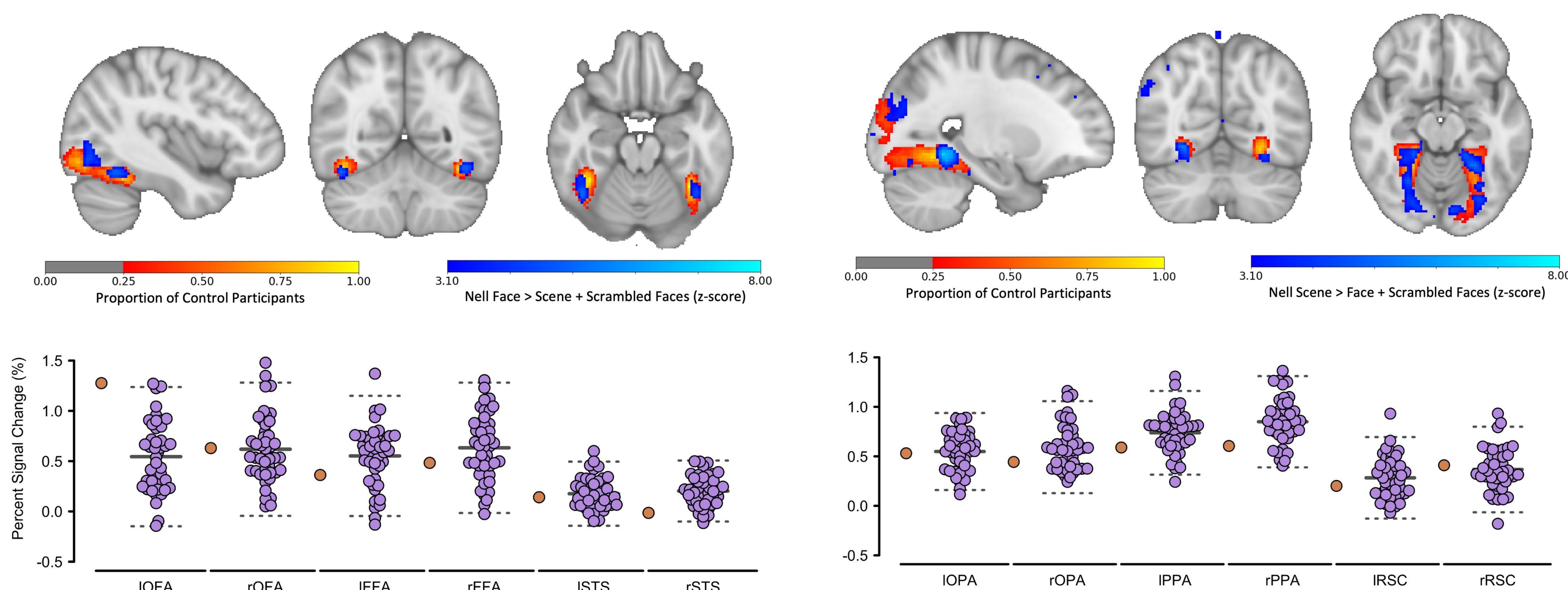


Natural viewing paradigm

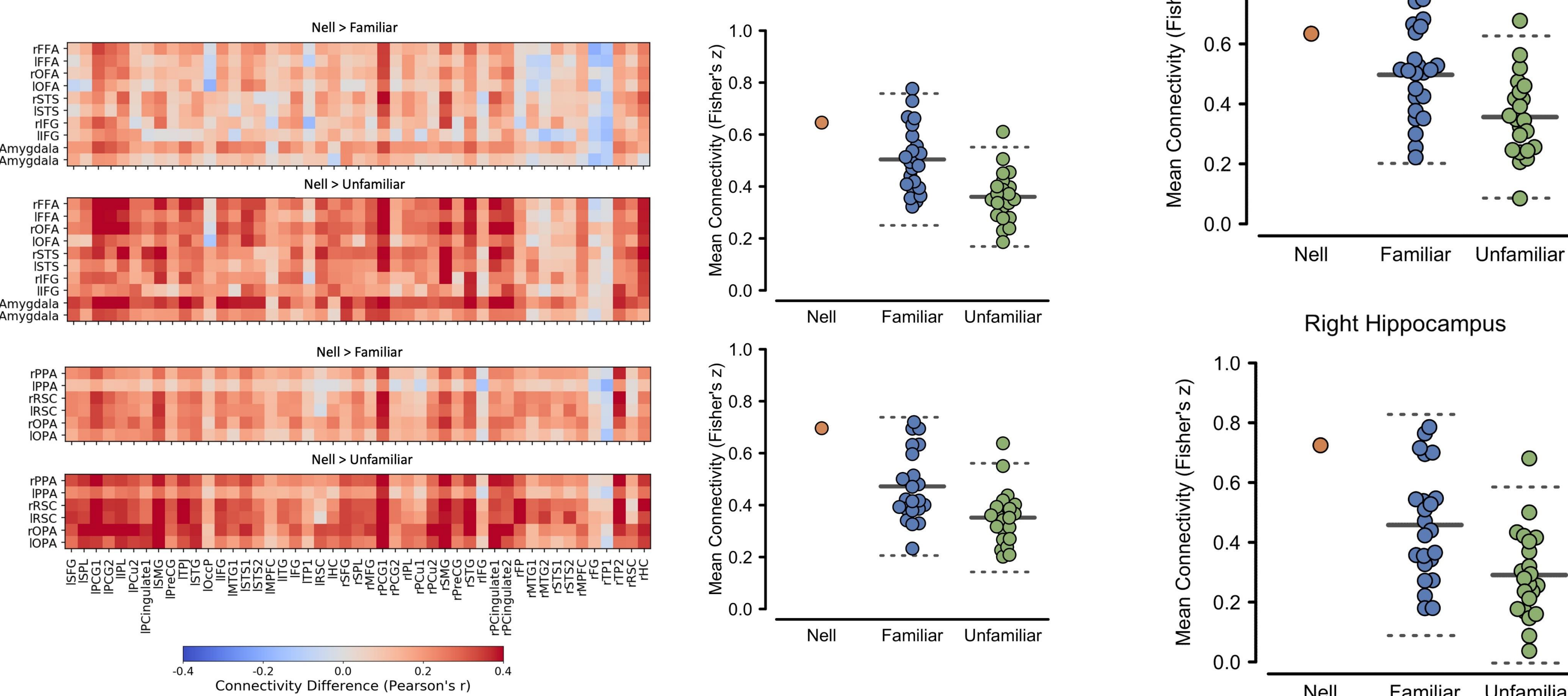
To simulate natural viewing, participants - including Nell, who had never seen the show - watched clips from *Game of Thrones* during fMRI scanning. We used inter-subject correlation (ISC) and functional connectivity analyses to compare neural responses between familiar (n=23) and unfamiliar (n=22) viewers. Our goal was to identify brain regions where Nell's responses aligned more closely with those of familiar participants, potentially revealing how hyperfamiliarity relates to typical patterns of familiar face processing under naturalistic conditions.



Neurotypical neural responses in category-selective regions in HFF



Enhanced functional connectivity between visual and non-visual regions in HFF



Conclusions

- Visual regions show typical face processing in hyperfamiliarity for faces (HFF).
- Atypical responses emerge in non-visual areas, including the hippocampus.
- HFF is marked by increased connectivity between visual and non-visual regions, which may drive the abnormal sense of facial familiarity.
- Familiarity perception relies on coordinated activity across the broader face processing network.