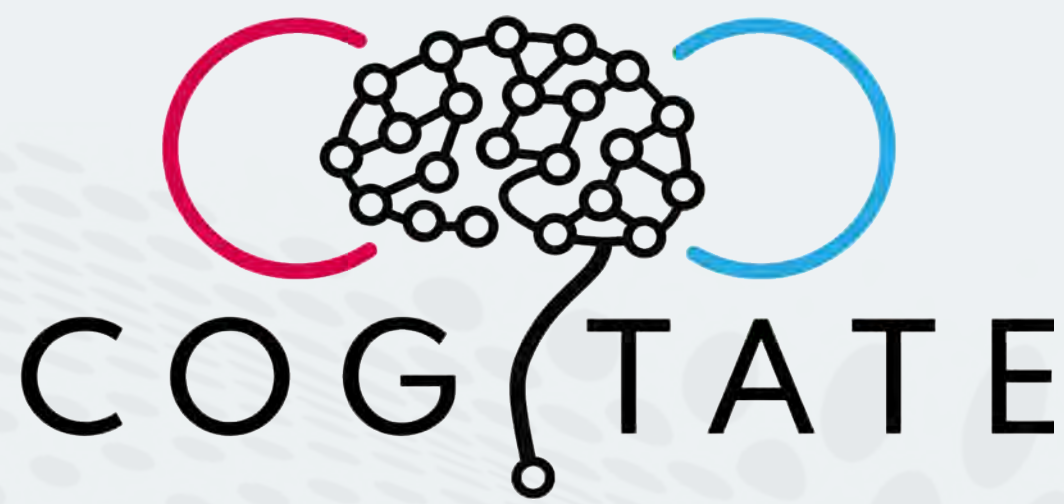


Putting theories to test: an overview of the Cogitate Consortium - an open science adversarial collaboration testing GNWT and IIT



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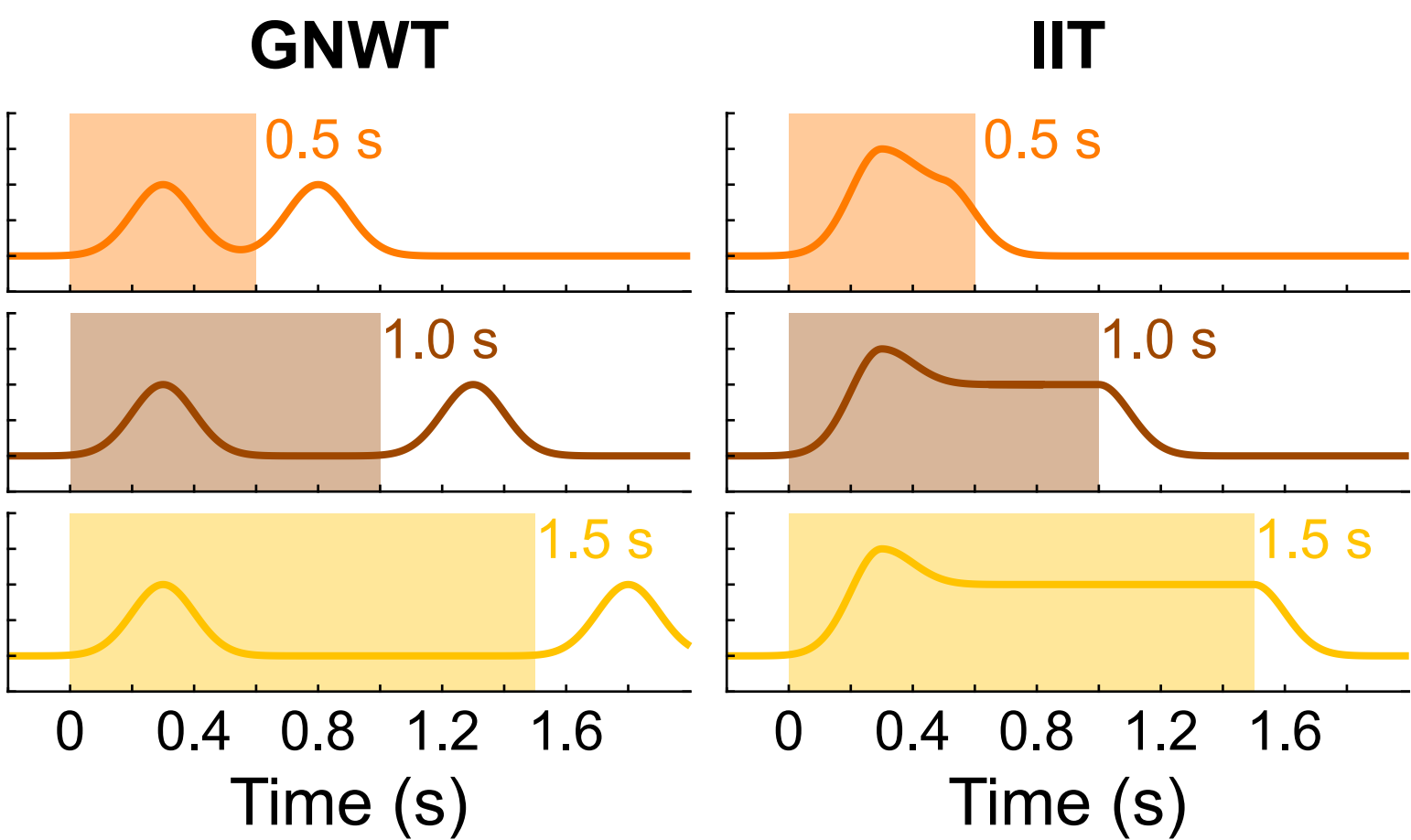


Introduction

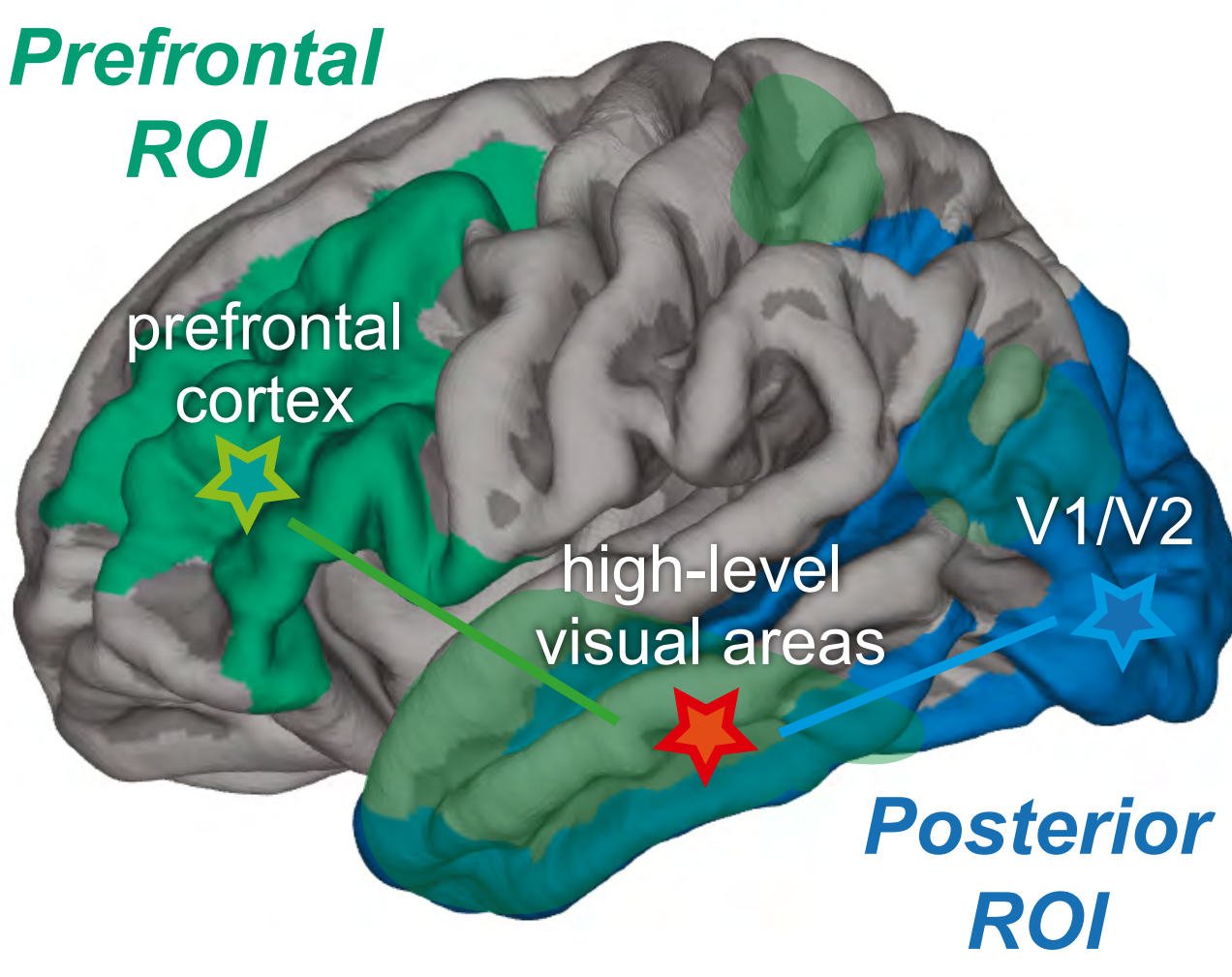
- Theories of consciousness have developed in parallel without much cross-talk.
- In this adversarial collaboration, we contrast two leading theories of consciousness: Global Neuronal Workspace theory (GNWT) and Integrated Information Theory (IIT).
- Two experiments were developed with, and endorsed by, the theories' proponents.
- These experiments were preregistered and run in seven theory-impartial laboratories using three complementary methods: functional Magnetic Resonance Imaging (fMRI), Magneto-Encephalography (M-EEG), and intracranial electroencephalography (iEEG).
- The theories are tested based on the same data and analytical approaches, and included an optimization phase and a replication phase.
- Here we present the rationale and predictions of the first study, including the experimental design, and the behavioral and eye tracking results.
- A series of posters present in-depth results obtained across three different data modalities and predictions

Predictions

Prediction #1:
Decoding of conscious content

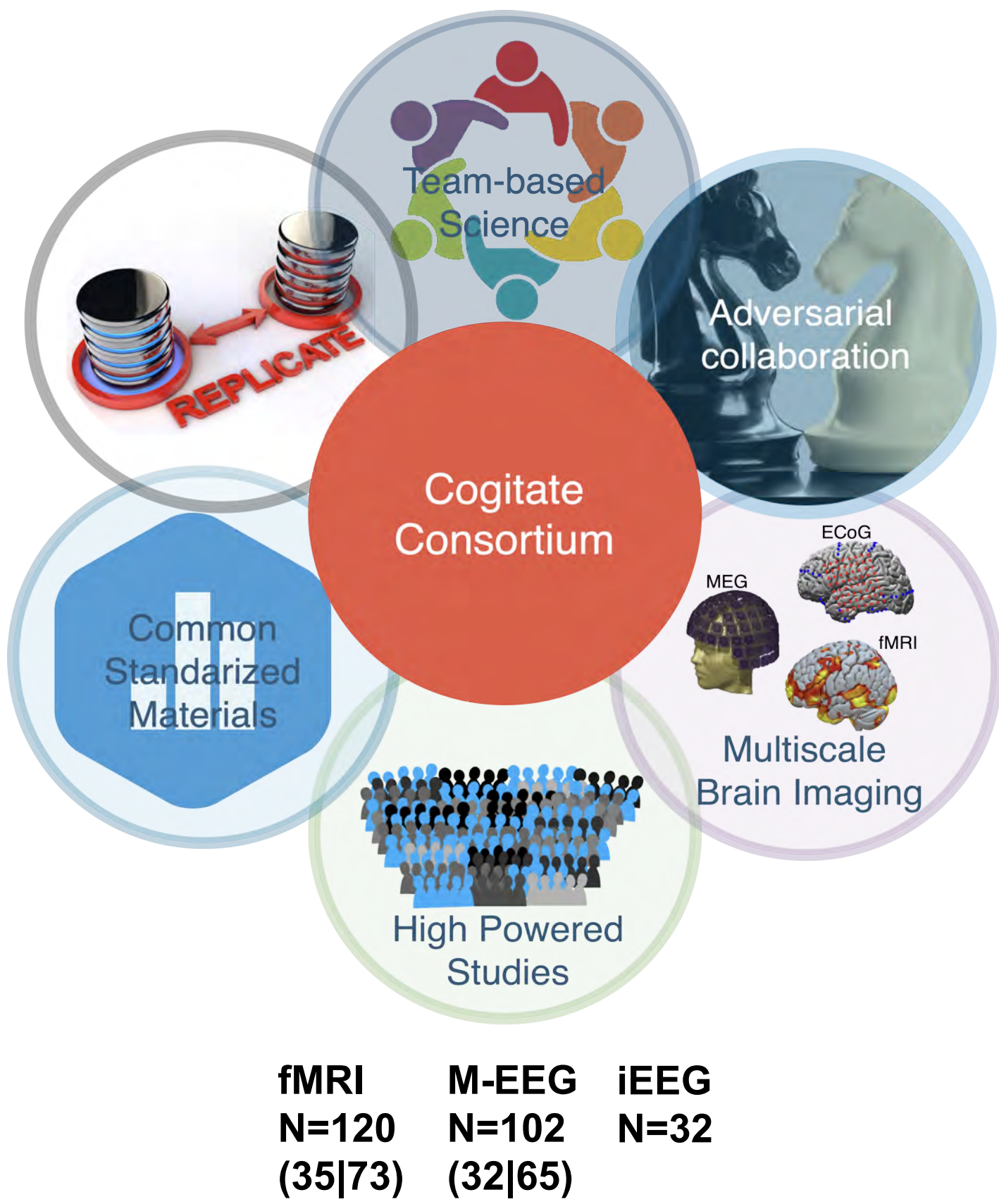


Prediction #3:
Interareal connectivity supporting consciousness

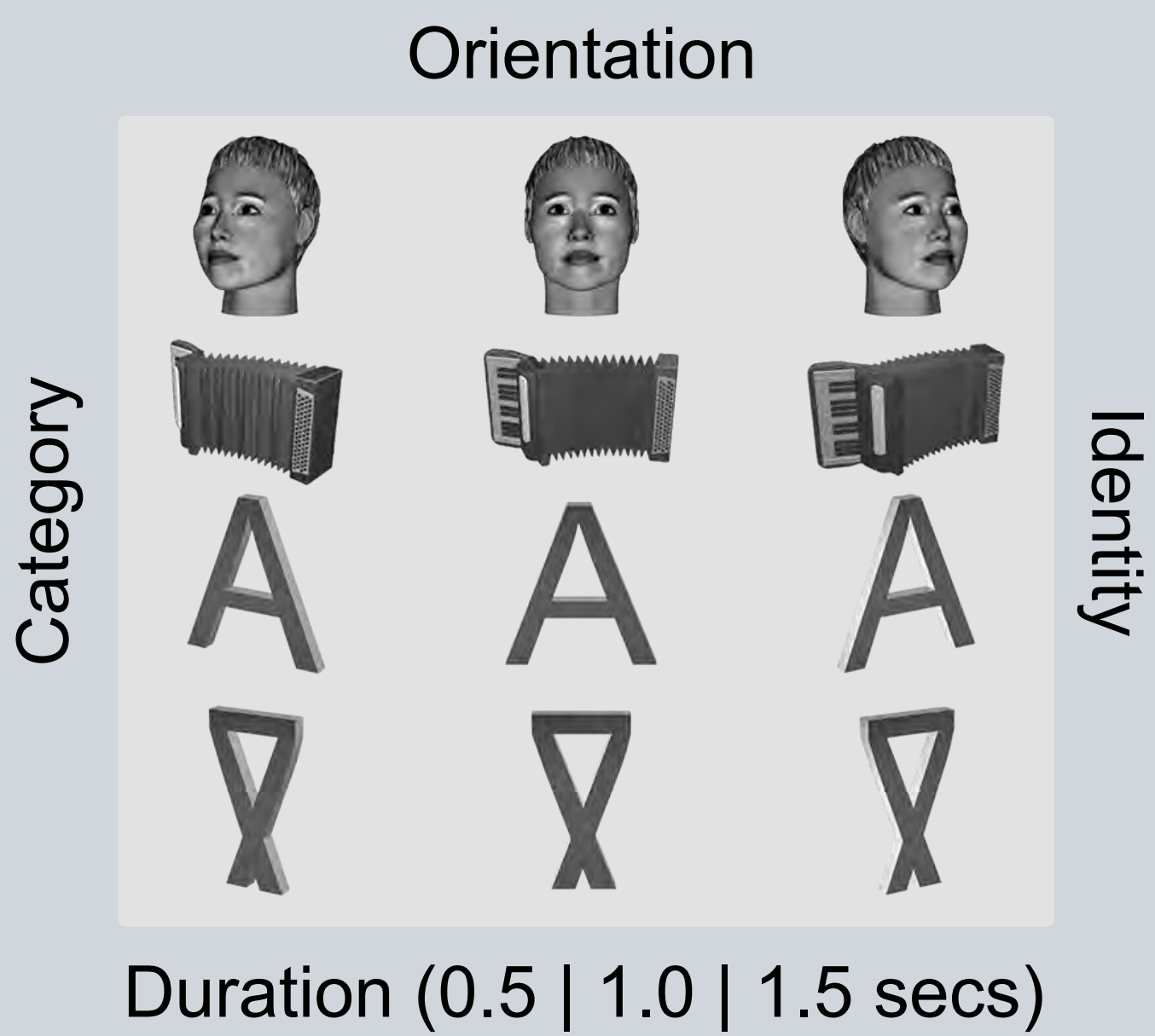
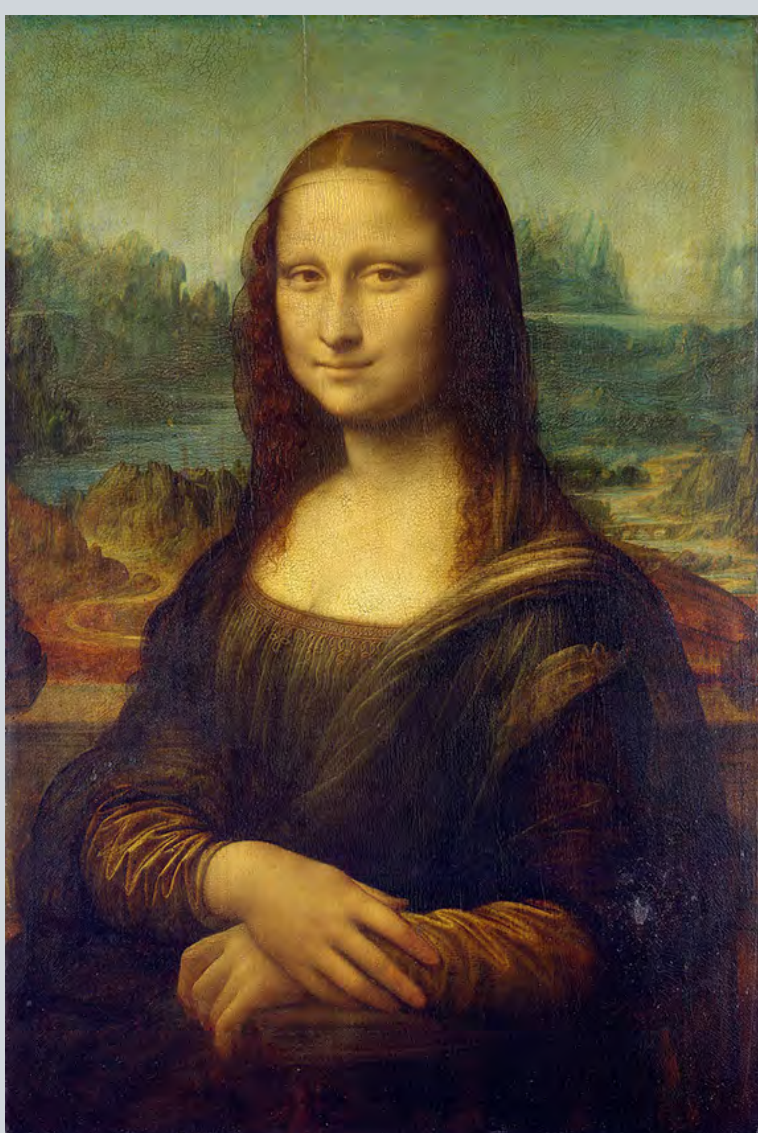


Prediction #2:
Maintenance of conscious content

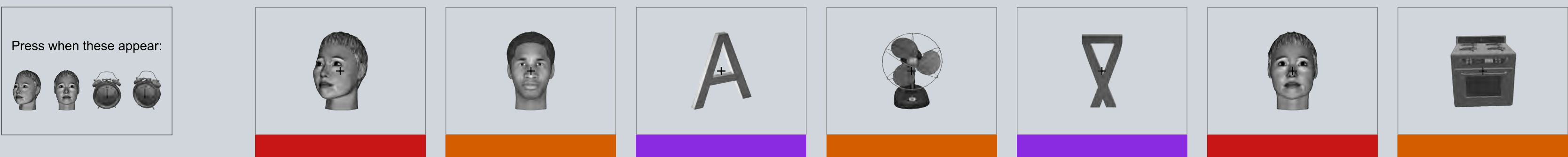
Methodology



Experimental design



Face/object task



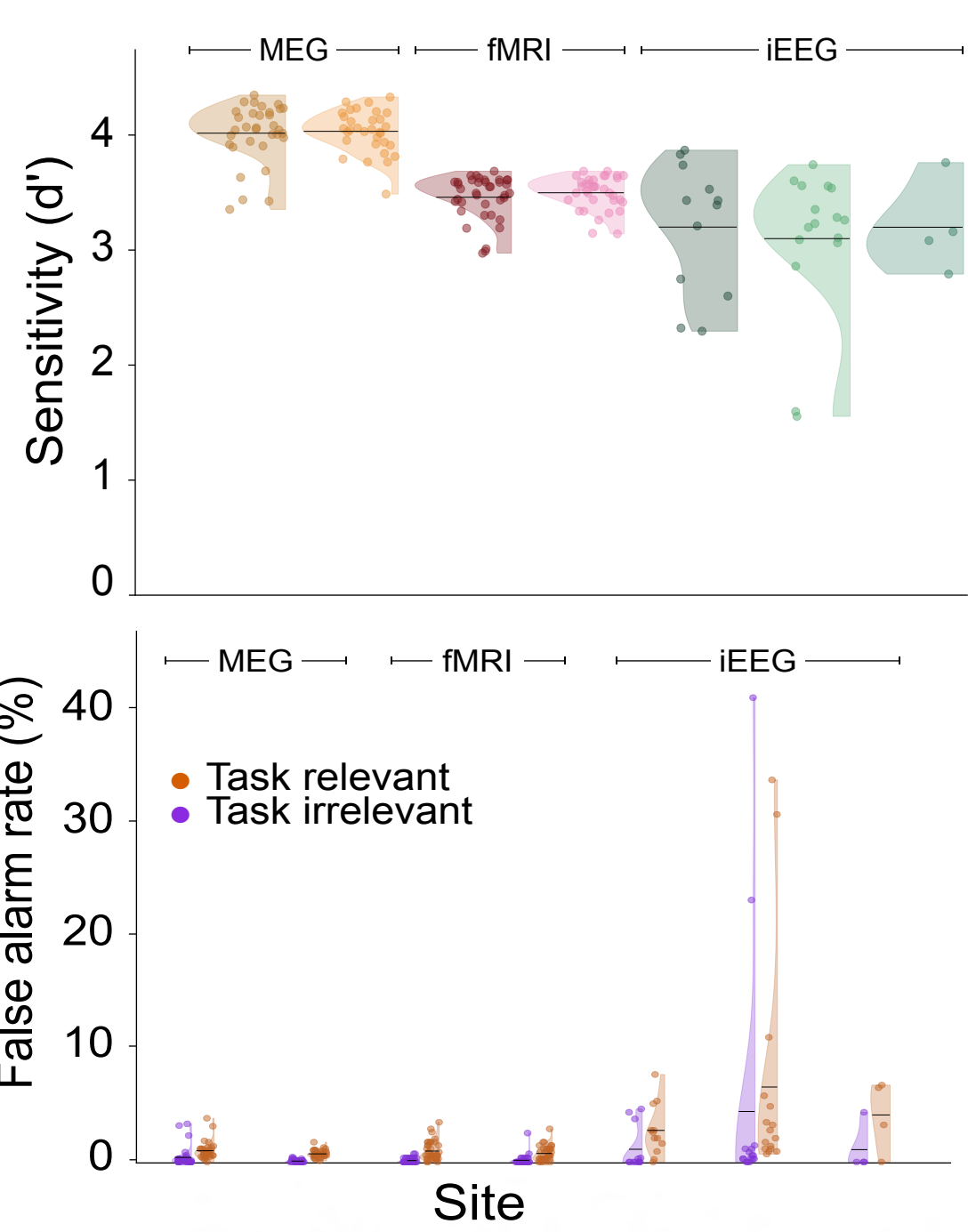
Letter/false-font task



Critical tests

THEORY	KEY HYPOTHESIS	TEST	POSSIBLE OUTCOME & INTERPRETATION
IIT	Content-specific complex of neural units in posterior cortex throughout the persistence of a percept independent of the task	PREDICTION #1 (decoding)	(1) Maximal decoding of category AND orientation in posterior areas APO (2) no decoding independent when using PFC
		PREDICTION #2 (activation/PFC)	Sustained content-specific activation/PFC across tasks in posterior areas
		PREDICTION #3 (activation/synchrony)	Lack of sustained content-specific activation/PFC across tasks in posterior areas
GNWT	Global broadcasting of information across prefrontal-parietal high-level sensory areas	PREDICTION #1 (decoding)	Generation of decoding (0.5-1.5s) of category AND orientation in PFC between T1 and T2, and vice versa
		PREDICTION #2 (activation)	Phase, content-specific, synchrony in PFC of stimulus onset & offset, for task-relevant
		PREDICTION #3 (synchrony)	Interareal synchrony between category sensitive areas and PFC (0.5-1.5s) depending on stimulus category

Behavior & eye tracking



Future directions

BUT, THIS IS NOT SCIENCE AS USUAL

What constitutes a result that arbitrates among theories?

- + another experiment (Video Game)
- + integration among predictions
- + integration among data modalities
- + integration with animal studies
- + develop methods to integrate evidence

+ ... changing the way we do science to understand consciousness!

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