



FUNCTIONAL CONNECTIVITY DURING ACTION RECOGNITION MODULATED BY TOP-DOWN GOALS

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INTRODUCTION

AON Network (Gasper, 2012)
Observation
 How does attentional strategy impact information processing in the action observation network?
 • The pSTS of the action observation network is implicated in encoding actions (Grossman et al., 2000) and in understanding action goals (Wyk et al., 2009). These connections are modulated, in part, by top-down influences from the IFG (Sokolov et al., 2018).

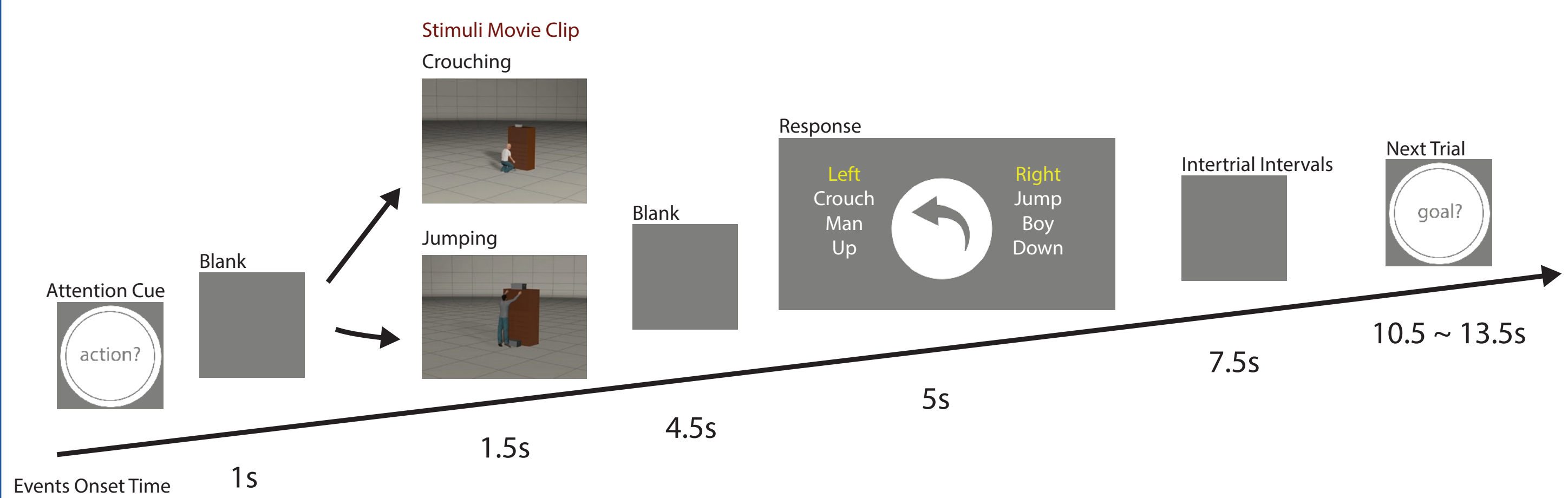
pSTS: posterior superior temporal sulcus
 IFG: inferior frontal gyrus
 AON: Action observation network

• We hypothesize that perceptual encoding on the pSTS is influenced by the observer's goals when viewing action, and that information about these goals is apparent in the IFG. Therefore, connectivity between the pSTS and IFG may be strengthened when attending to action kinematics.

• To test this hypothesis, we evaluate functional connectivity between the pSTS and IFG (and the AON) under different attentional strategies.

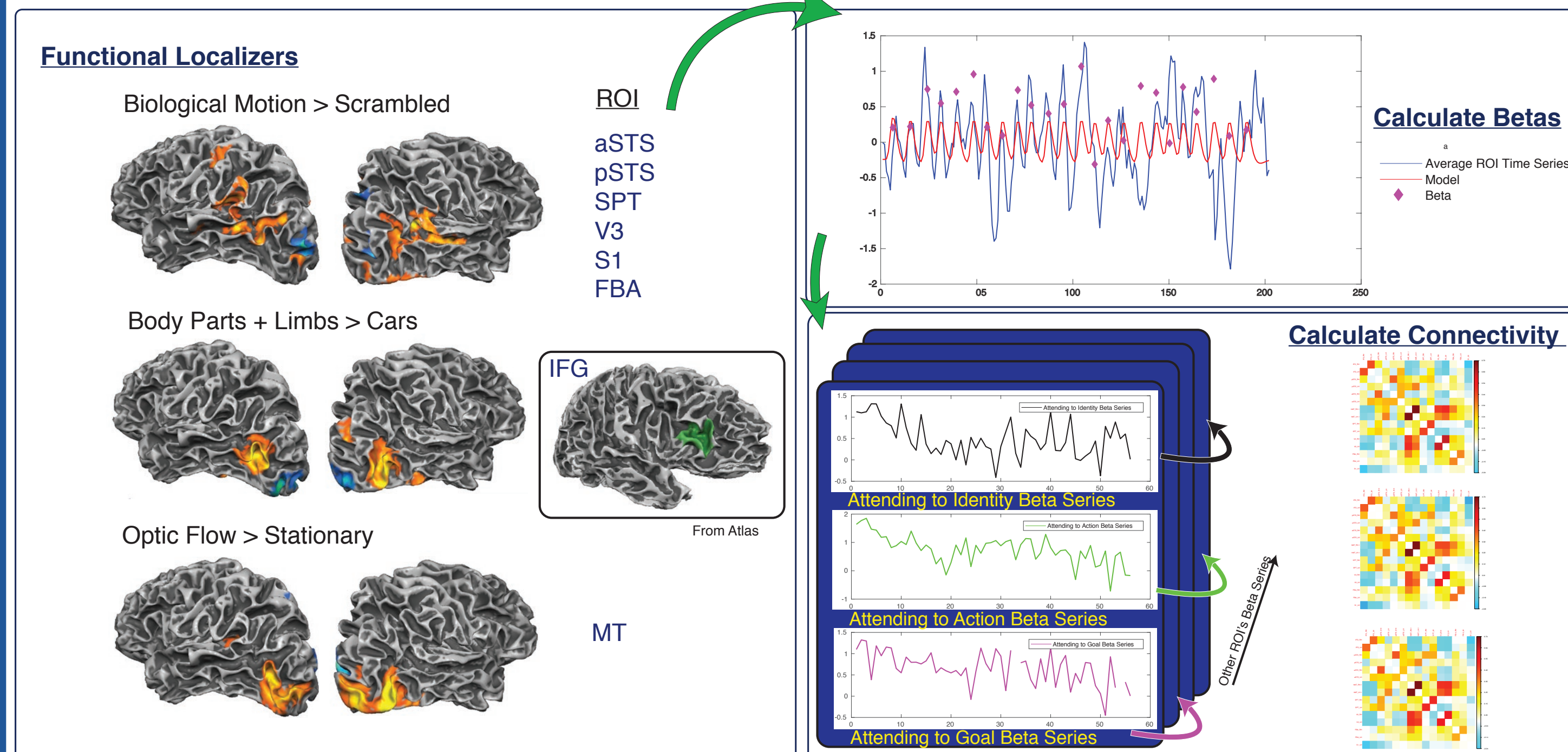
METHODS

Procedure:
 1. Participant was cued to attend to the action, goal or identity of the actor in a 3 sec vignette.
 2. Animations depicted one of two actors (man or boy), directing attention up or down, then crouching or jumping to the intended goal.
 3. Participants (N = 22) selected correct response based on the task cue.

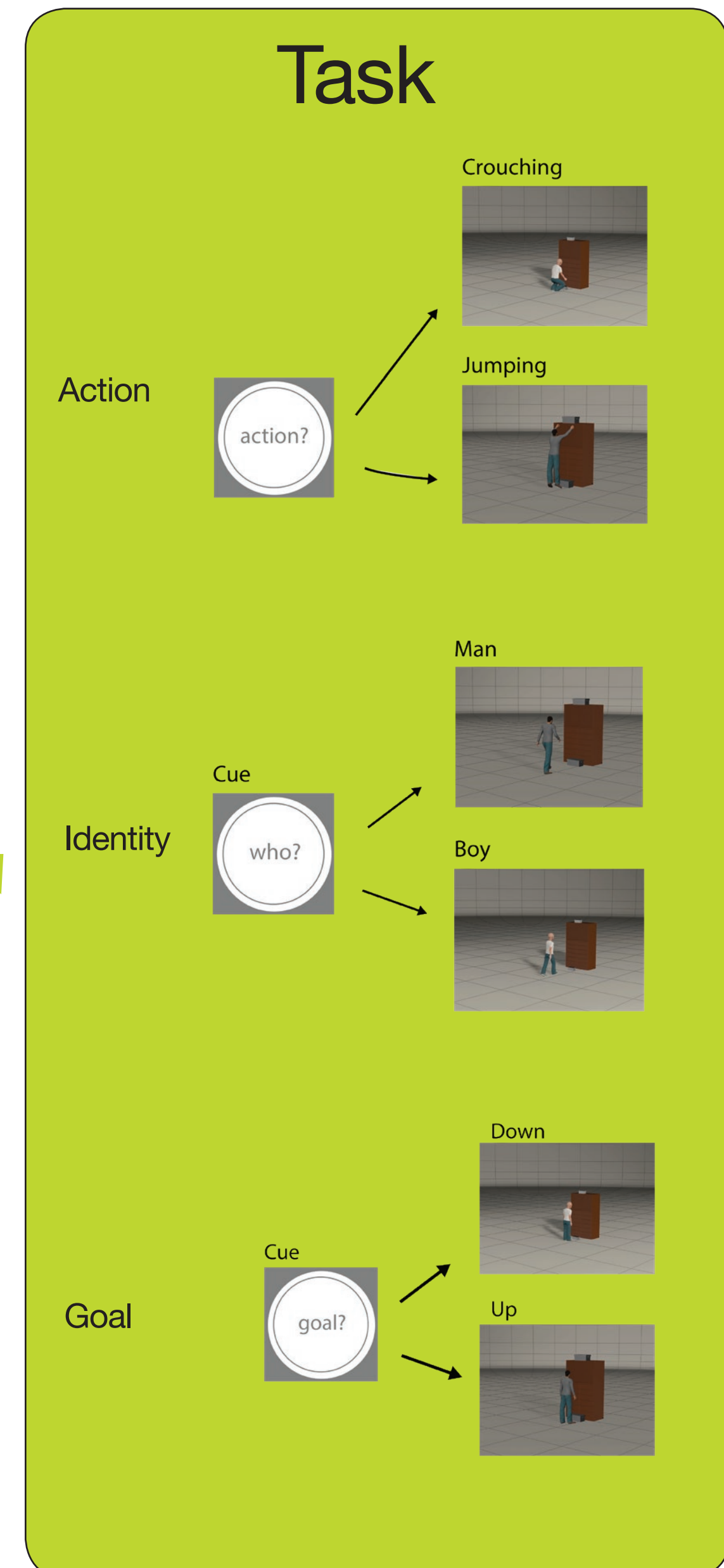


ANALYSIS

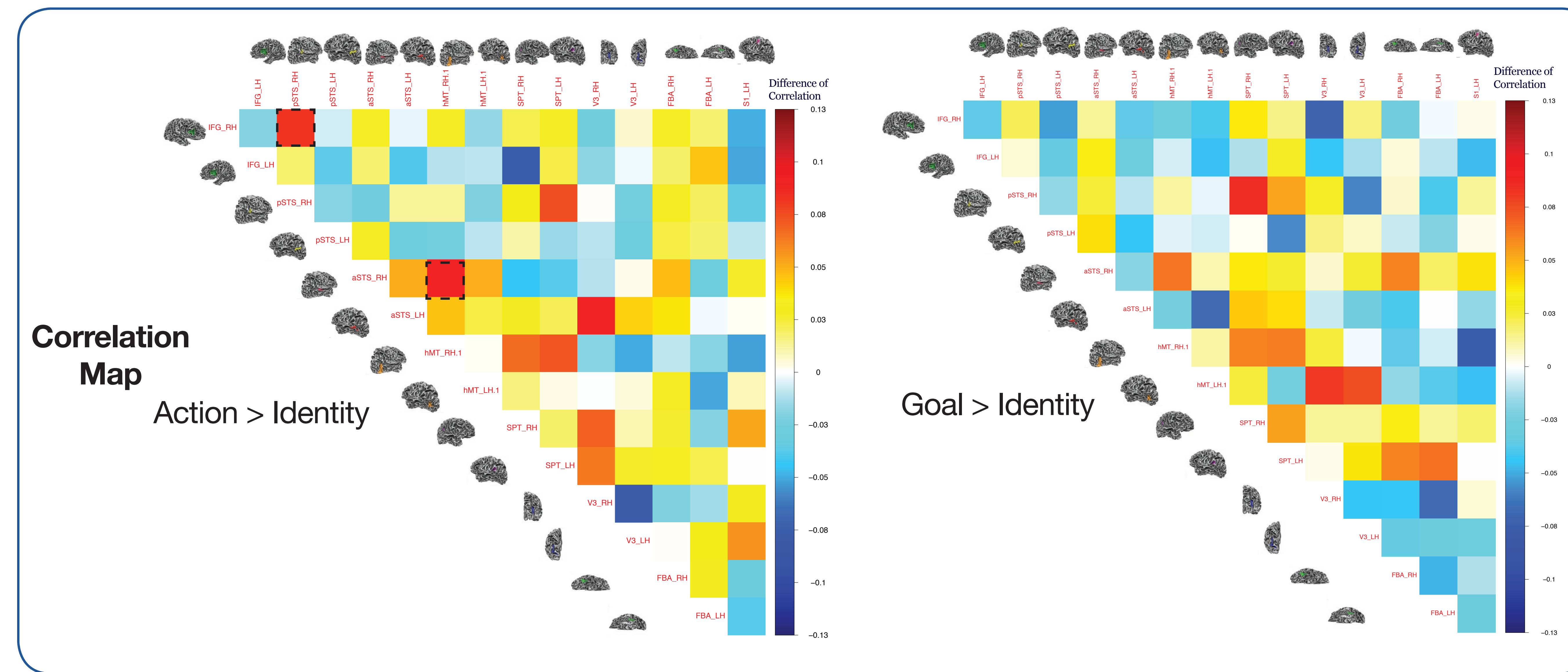
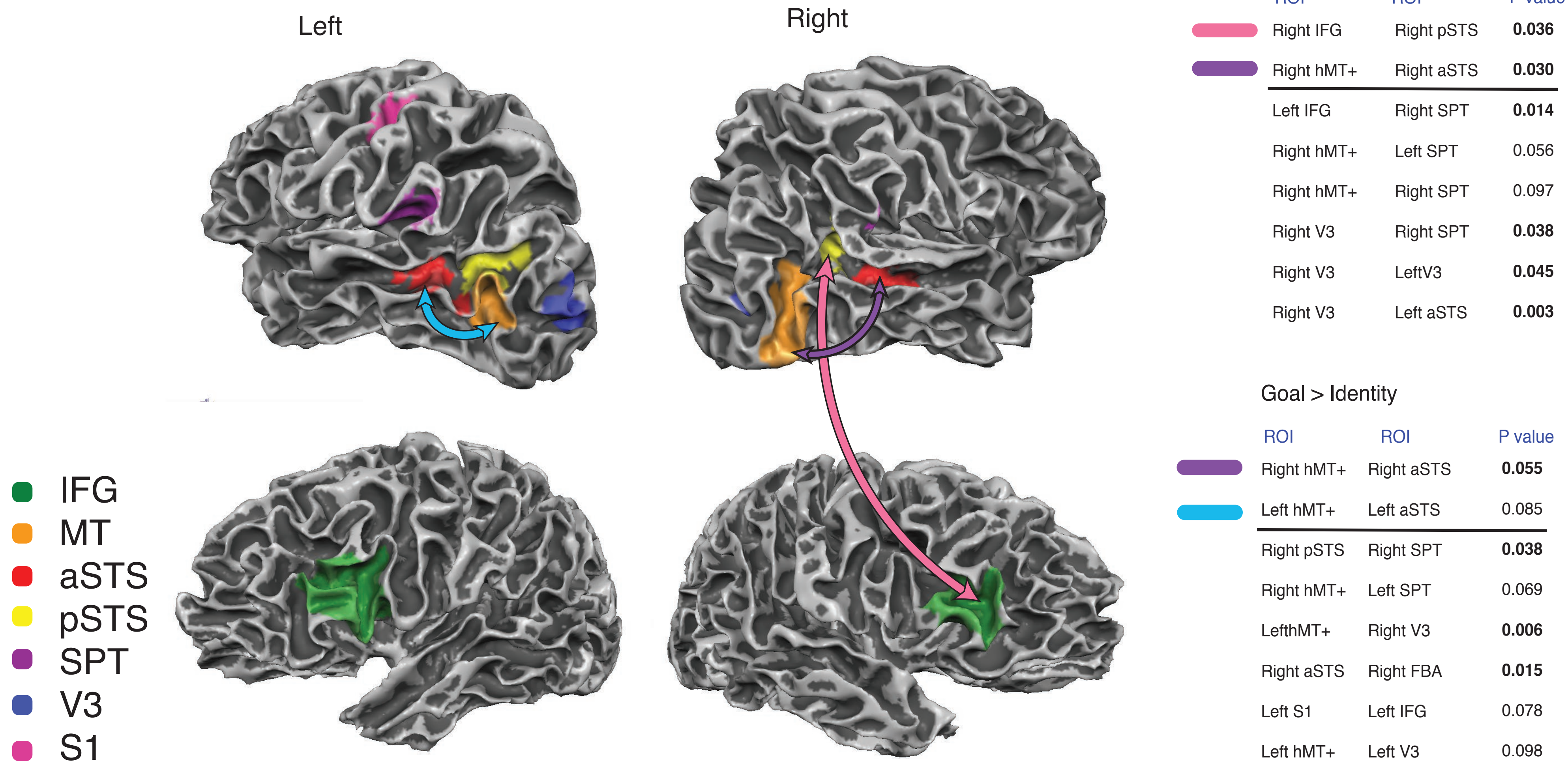
Rapid event-related design with 64 trials per instruction condition



RESULTS



Action Recognition Connectivity Results



Conclusion

• The IFG and pSTS are more connected when attending to action than when attending to actor identity. This is consistent with the hypothesis of top-down information from IFG shaping action encoding in the pSTS.

FUTURE DIRECTION

• Dynamic Causal Modeling (DCM)

Dynamic causal modeling is a data-driven process that uses probability to compare plausible models. Shultz et al. (2015) has used DCM to understand the direction of connectivity between pSTS and inferior frontal gyrus (IFG) when subjects viewing biological motion or faces.

I am planning to use DCM to find out direction of information flow between pSTS, IFG, and hMT+ under three attentional cues used in the current study: action, identity and goal. Since DCM usually requires smaller selection of regions, current study will be a good preparation.

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