

HIERARCHICAL PLANNING DURING NAVIGATION

¹ Jan Balaguer, ² Demis Hassabis, ² Hugo Spiers, ¹ Chris Summerfield

juan.deljobalaguer@psy.ox.ac.uk

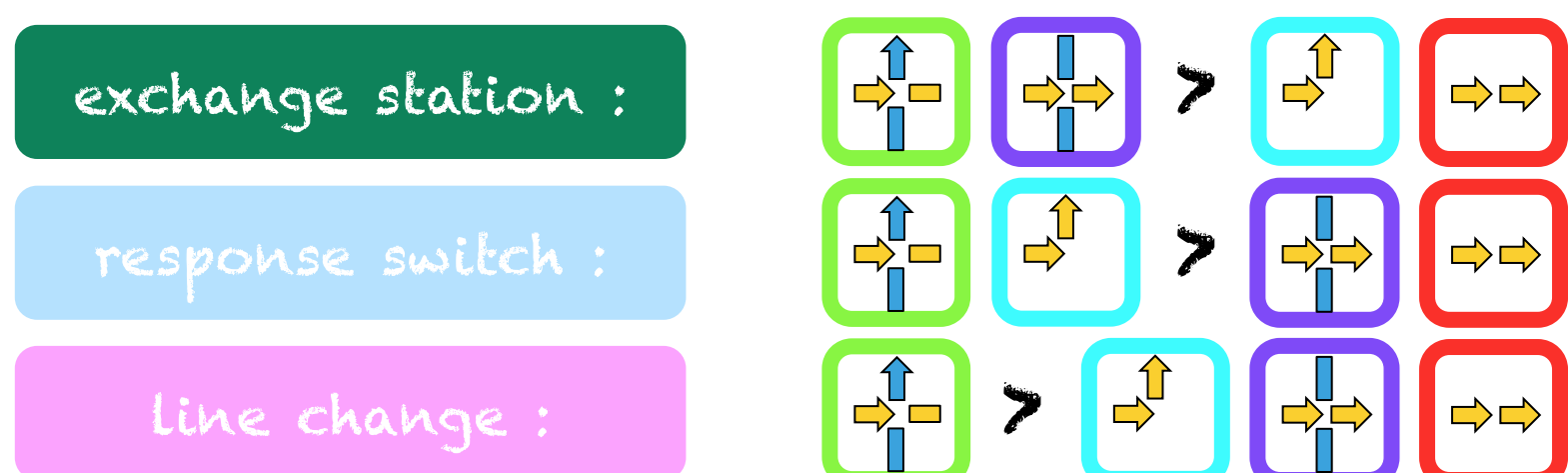
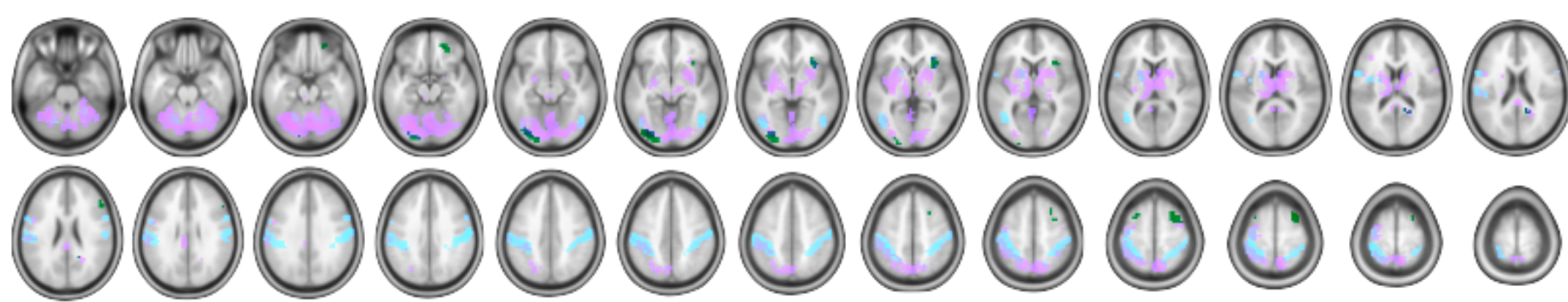


¹ University of Oxford
² University College London

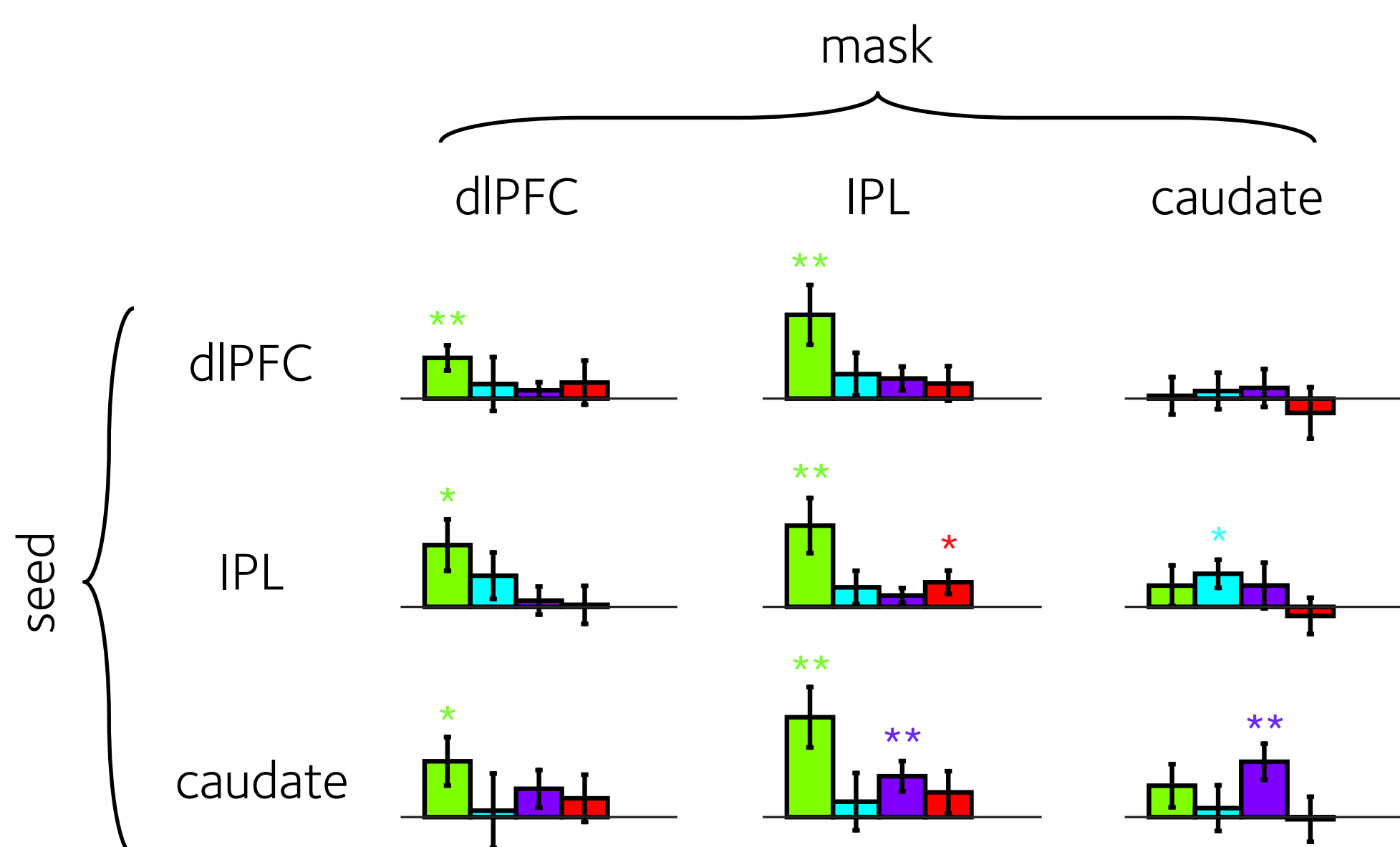
INTRODUCTION

Hierarchical representations alleviate the complexity of planning over multiple states. Using fMRI, we looked for the neural correlates of subgoal states (e.g. line changes) within a navigation task. 20 healthy participants planned their way within a virtual underground network they had previously been familiarised with.

Main effects



PPI analysis

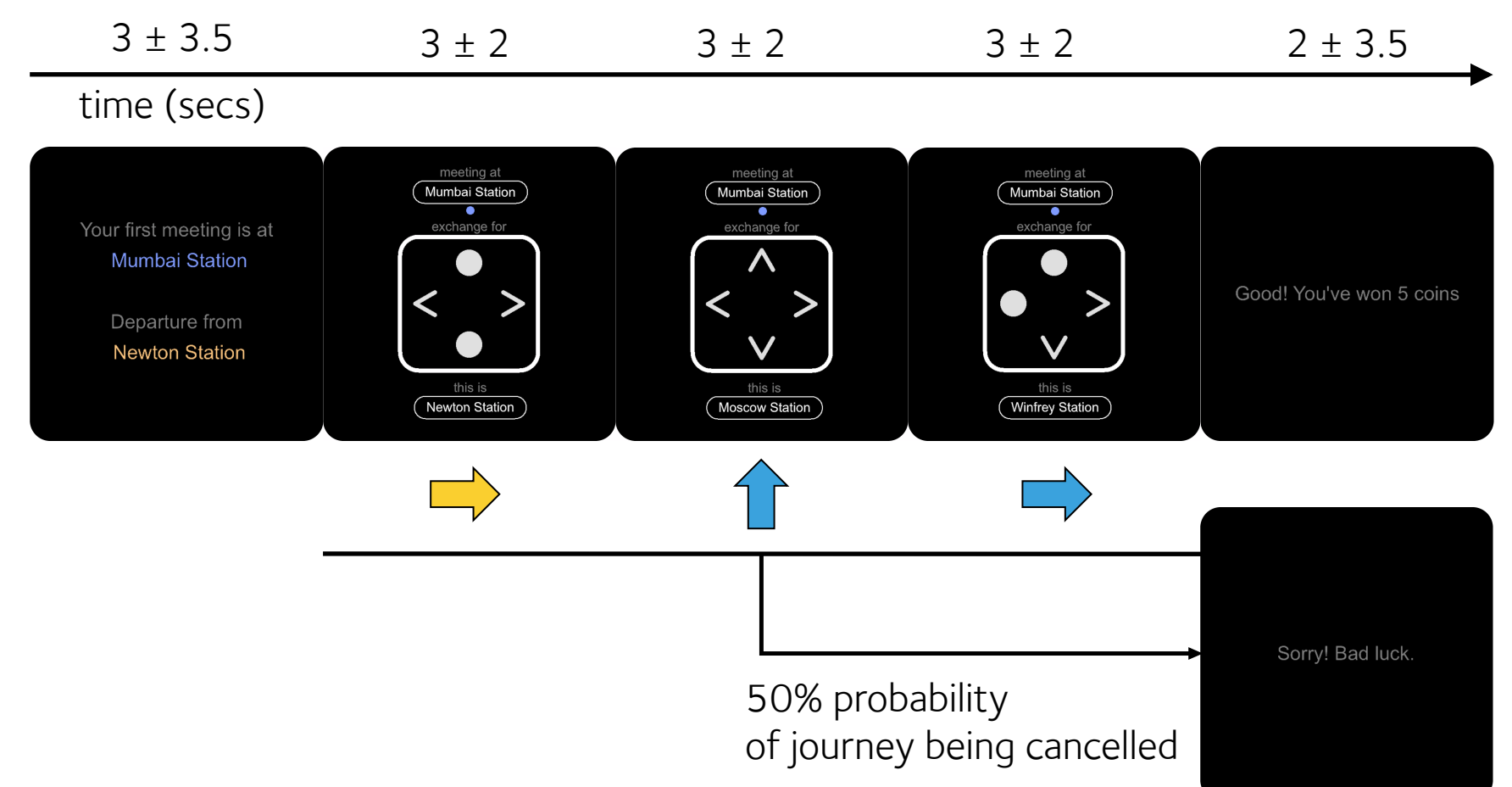


CONCLUSIONS

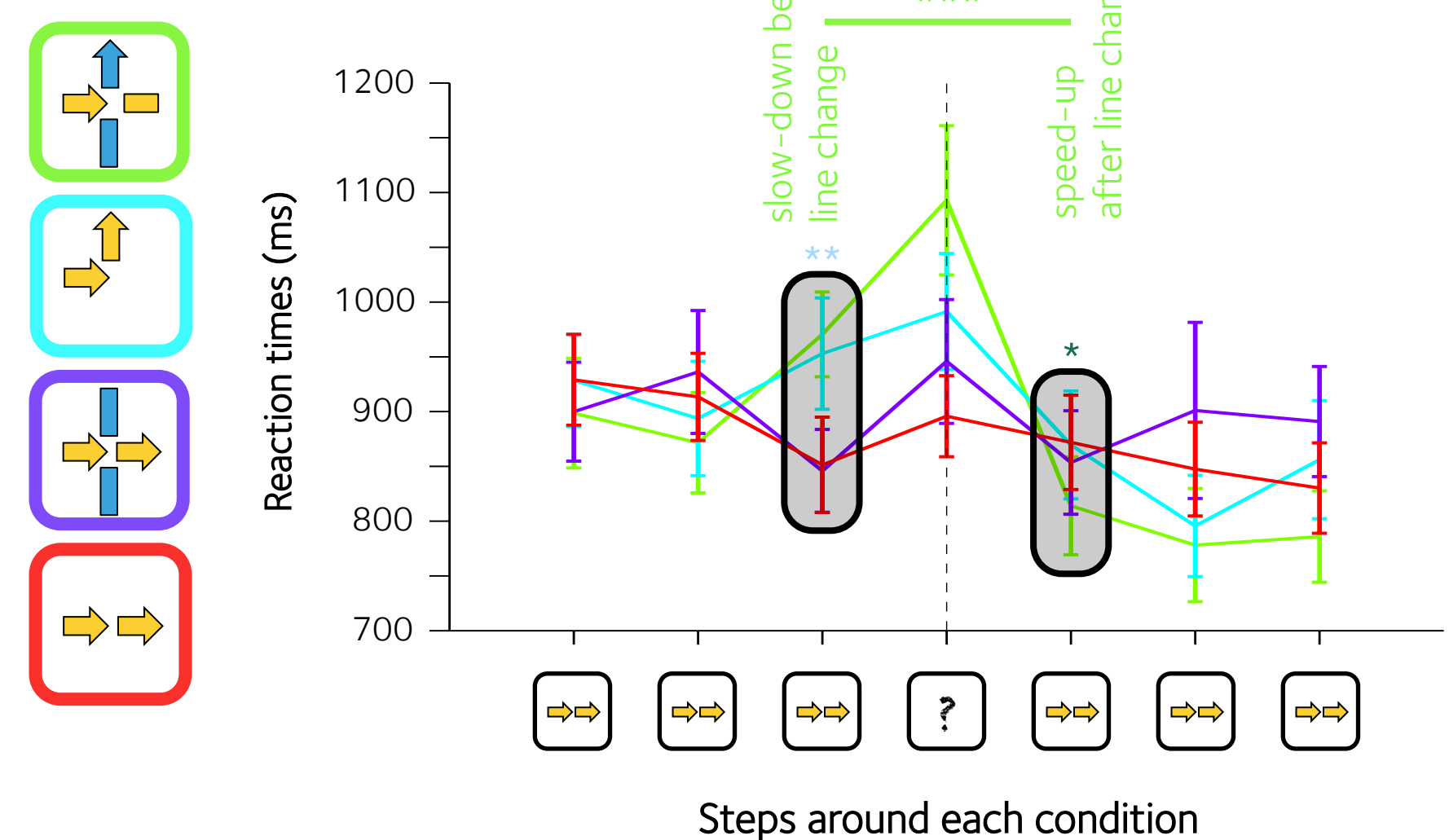
We have found unique signatures of a hierarchical representations in the brain while performing a navigation task. Specifically:

- IPL signals a switch of response.
- dIPFC signals exchange stations, but predicts the line change in advance
- caudate combines information from these two regions in order to change lines
- these regions are functionally connected during a line change (PPI analysis).

Task design

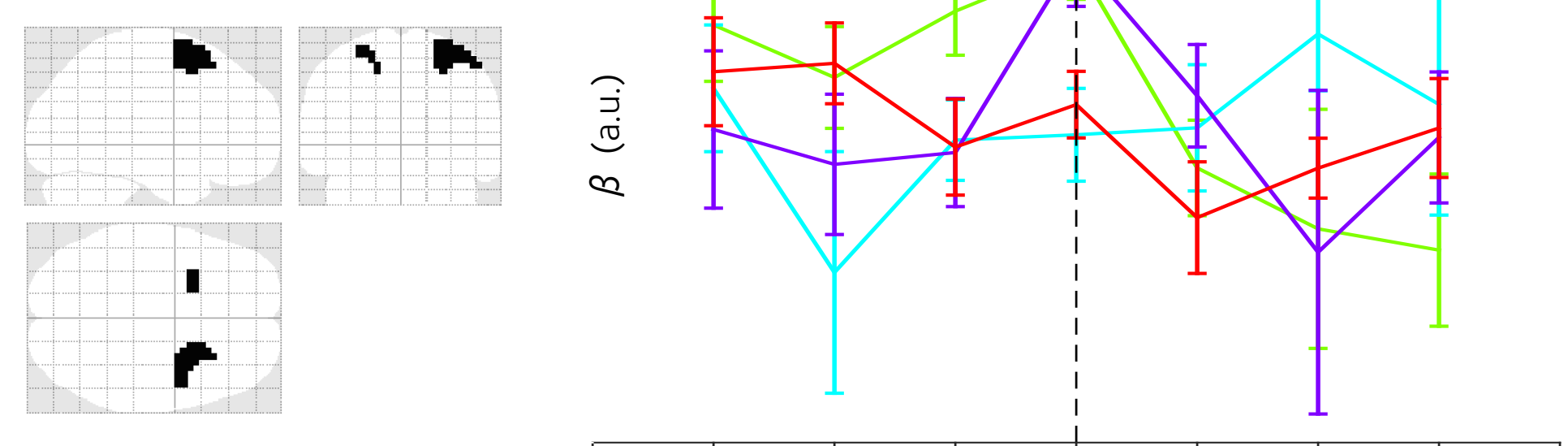


Reaction times

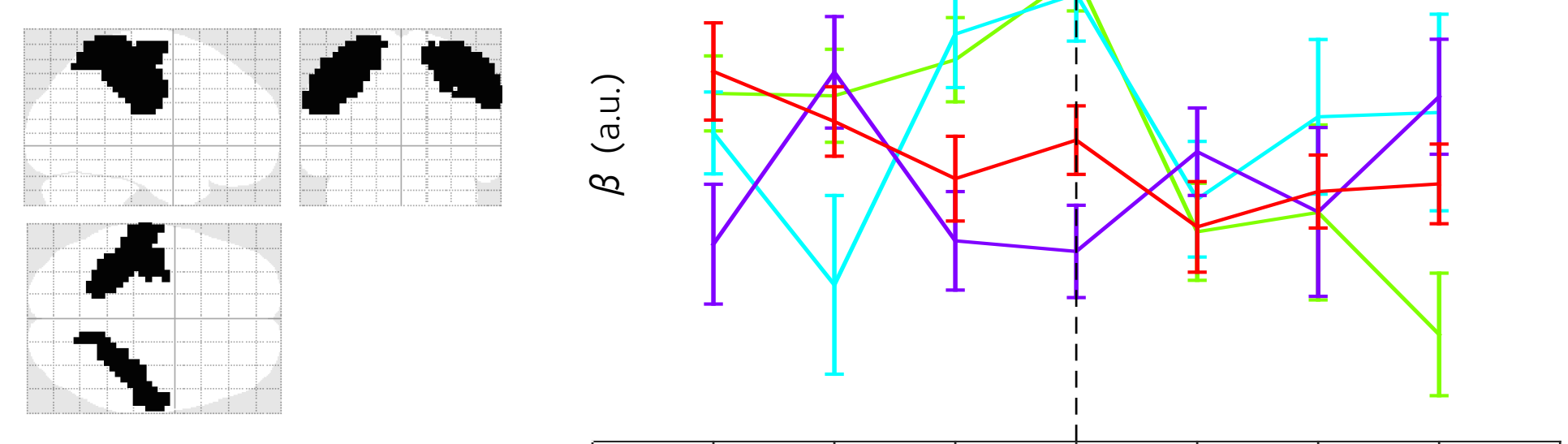


ROI analysis

dorsolateral prefrontal



inferior parietal lobule



right caudate

