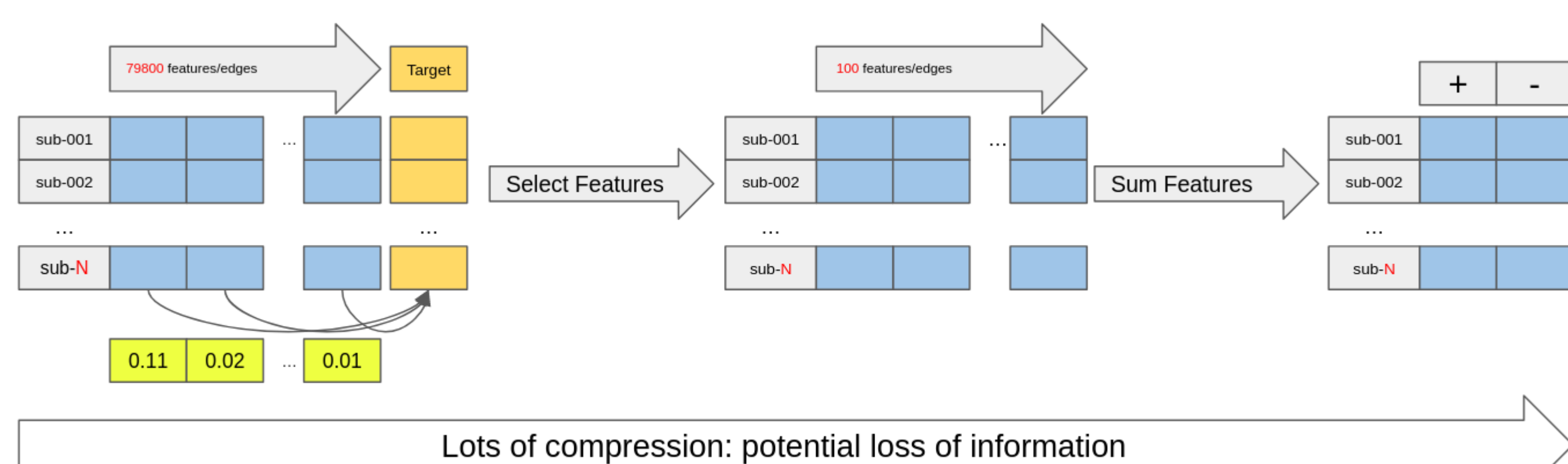


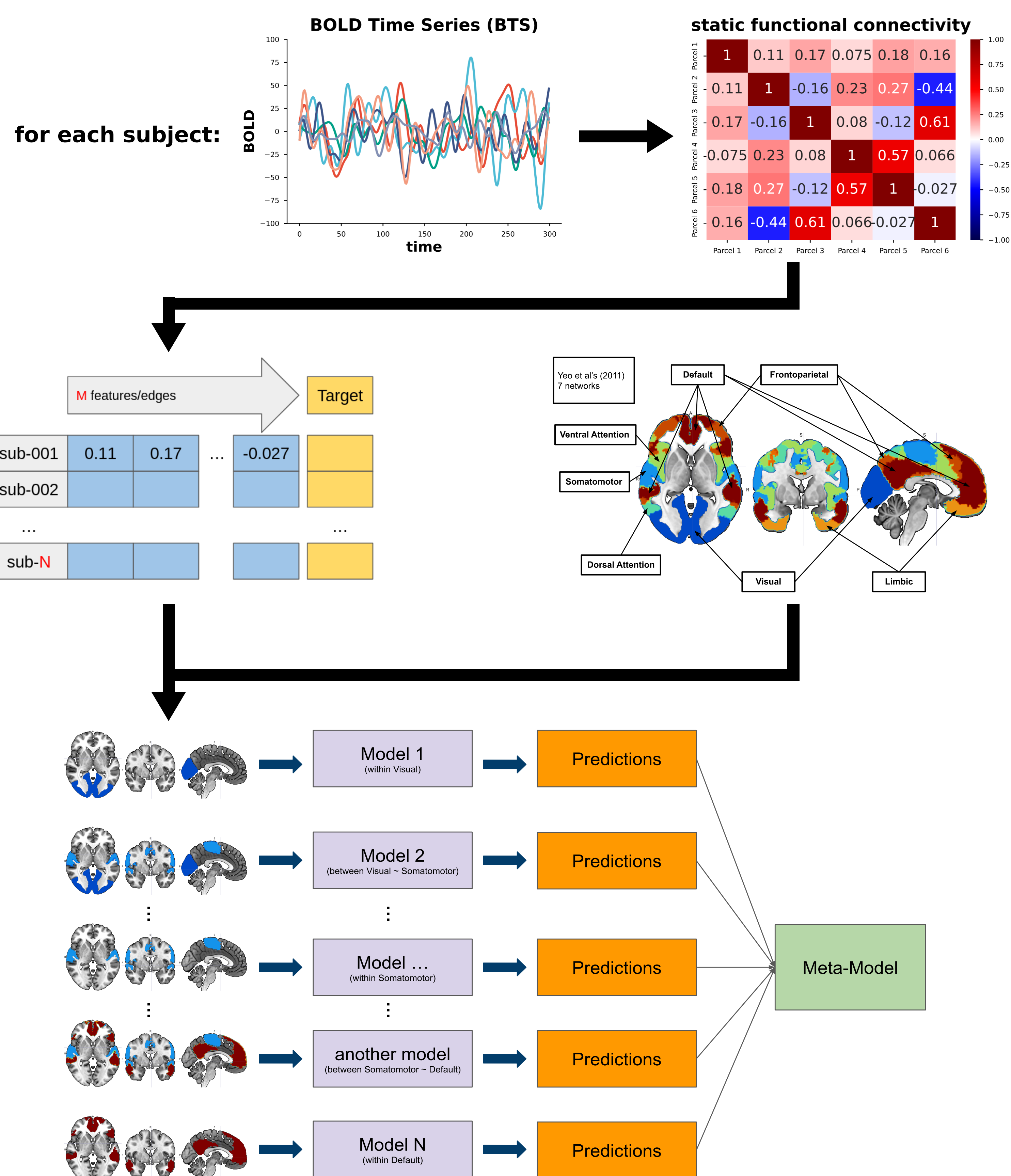


Introduction

- Functional Connectivity (FC) refers to the statistical dependencies between the activity of distinct brain areas [1].
- FC has shown significant potential as a biomarker in various studies, indicating its future applicability:
- It varies between individuals and remains consistent within an individual, demonstrating its stability [2,3].
- FC is associated with individual cognition and clinically relevant symptoms of mental disorders, highlighting its importance in research and clinical contexts [4,5].
- High-dimensionality poses a challenge for FC as it often leads to overfitting, reducing its ability to generalize effectively, which is exacerbated by the typically limited size of MRI datasets due to expensive data acquisition [6].
- Current approaches trying to deal with this tend to compress the data aggressively, potentially leading to loss of signal of interest. Example: CPM [4]

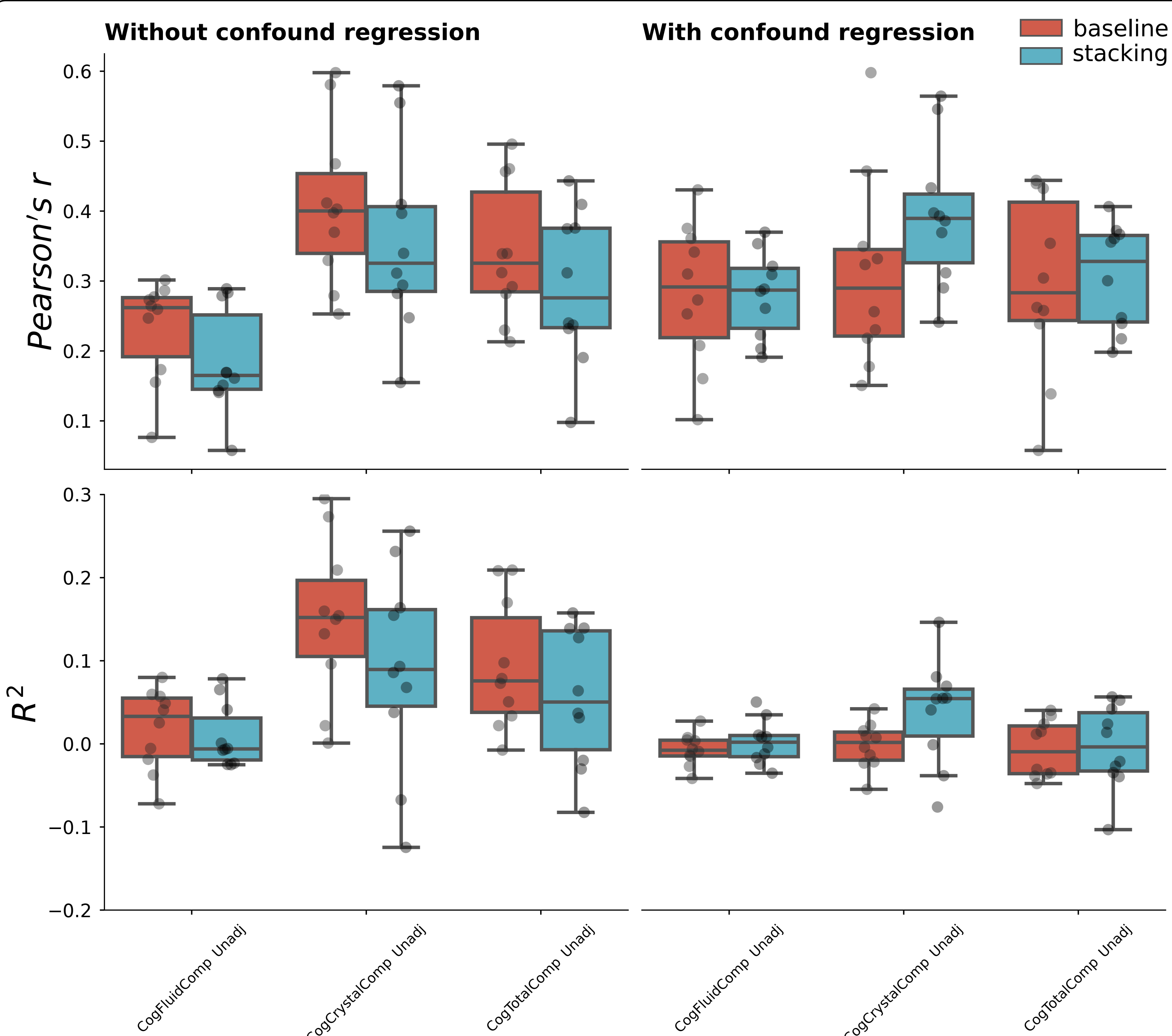


Methods



- Objective: predict 3 cognitive targets in Human Connectome Project (HCP) [7] dataset (N = 968)
- stacking_7: Yeo's 7 [8] networks are stacked by building a model for every set of between-network connections and every set of within-network connections (all models are SVM's with RBF kernel)
- baseline: "connectome-wide" model fitting (i.e. one model is fitted on all features; RBF SVM)
- 10-fold grouped cross-validation for evaluation of out-of-sample performance

Results



Discussion

- No advantage of stacking over baseline "connectome-wide" model fitting when confounds are not removed.
- Advantage of stacking over baseline "connectome-wide" model fitting in the prediction of crystallised intelligence when removing confounds.
- Next steps:
 - attempt stacking in age prediction in an independent dataset
 - attempt more complex combination of model families in stacking

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