Neural Correlates of Fluid Intelligence via Structural and Functional Network Connectivity Measures

(Prediction of Variance in Fluid Intelligence)

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Emerging research suggests that abnormalities between and within distinct neural networks of the human brain can characterize/predict/explain psychiatric disorders.

These networks can be characterized by an assessment of task-relevant correlated fluctuations in fMRI BOLD timeseries data. However, while the functional connectivity measures of   
  
the emergence of diffusion-weighted images can characterize(find syn) the structural network connectivity (SNC) between and within these networks as well.

In this study, we obtained publicly available resting-state fMRI and diffusion-weighted data from the Human Connectome Project in order to examine the relationship between various combinations of FNC and SNC values and fluid intelligence (FI) scores, which were assessed using the Penn Progressive Matrices task.

Using a Support Vector Regression (SVR) within a cross-validation framework, we used various combinations/sets/subsets of each subjects’ FNC and SNC values within and across different networks as features in order to predict their FI scores.  
  
Using the resulting correlation, we can assess the percentage of variance in FI accounted for by a subject’s FNC and SNC values.