Functional magnetic resonance imaging (fMRI) has revealed that the human brain is organized into networks of spatially distributed areas which activate and deactivate in unison. Resting-state fMRI analyzes individuals in a mind-wandering state and has revealed seven non-overlapping networks some of which have been labelled for function based on brain region. Currently, the relationship of resting-state networks with the task-state brain is not widely understood, nor is the extent to which resting-state network labels represent function. Using carefully coordinated tasks, our lab is able to infer function by observing the magnitude and timing of activity for a given network between different task conditions. Previous studies show that there is a consistent set of task-state networks that can be extracted using constrained principle component analysis (CPCA) which can be classified into categories based on cognitive function. This study reinforces the idea that task-state reveals networks may not be well explained by the resting-state paradigm and contributes to the simplification of network classification. The goal of this study was to identify the extent to which patterns of spatial activity can be distilled into reliable principles of identification for networks revealed by task-state fMRI-CPCA. Methods relied on manually sorting through images thought to represent each network in order to observe key brain regions that show reliable patterns. Novel techniques were used to enhance the visualization of such patterns. Main findings reveal 3-4 brain regions which differ predictably between networks including the cingulate cortex, supplemental motor area, superior parietal cortex, and the insular cortex.

Themes:

Check (highlight) the most applicable theme according to the abstract.

| Innovation and Technology | Health and Wellness | Culture and Society | Sustainability and Conservation |

Comments:

Well written abstract. It is clear and refrains from using jargon.