Title (max 85 characters): Role of Core Mental Workspace Network in Representing Various Sensory Stimuli

Description (max 250 words):

Previous studies in our lab have found that the processing of visual imagery is distributed across regions of a mental workspace network including the occipital cortex, posterior parietal cortex, precuneus, lateral occipital cortex, dorsolateral prefrontal cortex, and frontal eye fields. In these areas it was possible to predict representations in and manipulations of visual mental imagery by training a machine classifier on patterns of neural activity on one region and testing it on patterns of activity in others. \*\*\*This implies that the various operations and representations are processed in a distributed fashion by this core network. In our next project, we would like to see if this mental workspace similarly recruits auditory cortex for auditory mental imagery. Instead of the occipital cortex, the auditory cortex would be a region of interest, along with the other five. We would pair various auditory stimuli with visual cues and test recall of the auditory cues. The study would see if the mental workspace regions are engaged by auditory stimuli, and if the patterns in each region caused by the auditory stimuli can be cross-classified with each other. The mental workspace has shown flexibility in doing this with visual stimuli, and we hypothesize that it is similarly involved in the maintenance and manipulation of sounds. To implement the study, a program would be written to present the stimuli, and we will collect structural and functional scans using fMRI as participants perform a delayed match to sample task involving the stimuli. Patterns of activation in the regions of interest would be used to perform multivariate classification analysis, and cross-classification will also be tested.