**Working Memory and Response Inhibition:**

Functional and Structural MRI are two imaging approaches to measuring the brain. MRI captures brain structure in high-resolution, similar to a 3D image. The fMRI is dynamic, capturing an indirect measure of neuronal activation (oxygen changes). Brain imaging may yield value to understanding how the brain functions different with psychiatric disorders like ADHD, Schizophrenia, and Bipolar Disorder. However, these disorders are heavily correlated with demographics. The deficits in working memory and response inhibition observed with these disorders may be caused by other factors such as low education levels.

Here, we will investigate how working memory and response inhibition are predicted by fMRI, and MRI measures, and compare this with other “low resolution” features including: demographic information, medical diagnoses, and zodiac sign (in HTAC file). What is the relative effect size of each modality to predict working memory and response inhibition? Models should be run separately within patients and controls, since these groups had different inclusion/exclusion criteria. Depression measures include Hopkins Depression, Chapsoc\_total, and chapphy\_Total, which all capture different types of depression. These scales are also provided on Dropbox in the accompanying folder.

Around 200 subjects had MRI/fMRI imaging performed out of a larger group of about 1000. You should create two datasets by combining measures- one larger one without imaging data, and one smaller one that contains the imaging data.

**Description for Project 1:**

Use zodiac signs to predict response inhibition from mental disorder and including ADHD schizophrenia, depression and bipolar compared and other covariates; brain imaging, demographics and other given covariates.

**Description for Project 2:**

Use zodiac signs to predict verbal and spatial memory from mental disorder and including ADHD schizophrenia, depression and bipolar compared and other covariates; brain imaging, demographics and other given covariates.

**Variables of interest**

Variables of interest are noted below. You are welcome to add additional measures.

**fMRI measures: (CNP.xls)**

Visual\_Global\_Efficiency Somatomotor\_Global\_Efficiency Dorsal\_Attention\_Global\_Efficiency Ventral\_Attention\_Global\_Efficiency Limbic\_Global\_Efficiency Frontoparietal\_Global\_Efficiency Default\_Mode\_Global\_Efficiency

**MRI measures: (CNP.xls)**

Left.Amygdala Right.Amygdala Left.Caudate Right.Caudate Left.Accumbens.area Right.Accumbens.area TotalGrayVol CortexVol CorticalWhiteMatterVol Left.Putamen Right.Putamen Left.Pallidum Right.Pallidum Left.Hippocampus Right.Hippocampus WM.hypointensities non.WM.hypointensities

**Cognitive Measures: WM\_RI\_G\_Scores\_All\_Available.csv**

VWM\_G- verbal working memory SWM\_G- spatial working memory

RI\_G. – response inhibition

Cognitive Measures for around 750 subjects, including those who did not have MRI/fMRI, is provided in

WM\_RI\_G\_Scores\_All\_Available.csv

**Behavioral Measures: (ChapmanHAMDHopkins\_all.csv)**

HOPKINS\_SOMATIZATION HOPKINS\_OBSCOMP HOPKINS\_INTSENSITIVITY HOPKINS\_DEPRESSION HOPKINS\_ANXIETY CHAPPER\_TOTAL CHAPSOC\_TOTAL CHAPPHY\_TOTAL

Hopkins: Hopkins Symptom Checklist. These are divided into 5 “domains”- see Hopkins Symptom Checklist.pdf manuscript in Dropbox Folder.

The CHAP\* files are from the Chapman Physical Anhedonia, Chapman Social Anhedonia, and Chapman Perceptual Aberration scales in the file ‘Chapman scales.doc’

**Demographic Covariates:** HTAC\_Demographics\_Full.csv

AGE GENDER ETHNICITY SCHOOL\_YRS

**Medical Diagnoses (optional):** HTAC\_Qry\_1405Health.xls

See codebook for labels

**Birth Year for Zodiac:** BirthYearsofCNP.csv