Date

LEICA: CIC vs. SIC

Now that we have established that differences exist between healthy and obsessive-compulsive resting-state networks, we must ask which differences exist and how robust to challenge these differences are.

To examine these differences, we propose two distinct, but related, interrogations of the differences between resting-state networks. The first will examine the differences in activity between conditions in the networks common to both OCD patients and in healthy controls. As this analysis will use common networks between conditions, it will be referred to as Common Independent Components (CIC). The second interrogation will examine changes in both network activation profiles and network memberships. As this analysis will use separate networks between conditions, it will be referred to as Separate Independent Components (SIC).

In order to confirm the validity of our results, we employ three false-positive correction methods. The first is the Bonferroni multiple-comparison correction. The second is the Benjamini-Hochberg false discovery rate correction.

# Common INdependent Components (CIC)

This phase will examine differences in network activation profiles between healthy controls and OCD patients. This project may be split into the following phases:

## Extract the network memberships and activation profiles—which is to say, the ICs and their activations—from the BOLD data.

## Find upper bound of metrics in each condition

## Compare activation profiles between conditions

The comparison of activation profiles will use the following metrics and consist of the following comparisons:

## Metrics:

### Activation probabilities

### Metastability

### Entropy

## Upper bound: sum of each metric over all assemblies

## Comparisons:

### Group-level: healthy vs. patient

#### Compare upper bound of each subject

#### Plot distributions of upper bounds per subject

### Assemblies:

#### Ranks: assemblies according to metrics

#### Group-level: healthy vs. patient

#### Assembly-level: one-vs.-all

### Subjects

#### Ranks: subjects according to metrics

#### Group-level: healthy vs. patient

#### Assembly-level: one-vs.-all

# Separate Independent Components (SIC)

This phase will examine differences in network activation and membership profiles between controls and OCD patients. This project may be split into the following phases:

## Extract the network memberships and activation profiles—which is to say, the ICs and their activations—from the BOLD data.

## Compare memberships between conditions

## Find upper bound of metrics in each condition

## Compare activation profiles between conditions

The comparison of membership profiles will use the following metrics:

## Network-based statistic

## Membership correlation

Activation profiles will be compared in the same fashion as in the CIC version.