INTRODUCTION

Mental health problems, including depressive and anxiety disorders, suicidal ideation, and body image disturbances are highly prevalent on college campuses. Anxiety disorders are some of the most common forms of mental illness in the US, with a 12-month prevalence rate of 19% (NIMH).

Neuroimaging studies of anxiety have linked decreased functional and structural connectivity between the amygdala and the ventromedial prefrontal cortex (vmPFC) with elevated levels of self-reported anxiety. Similar differences in connectivity have been observed between clinical and healthy population.

Question 1: Does RSFC connectivity between amygdala and vmPFC replicate Kim et al., 2011 when using trait instead of state anxiety?

Question 2: Are sex and duration between survey and fMRI moderators of this relationship?

METHODS

Subjects
A cohort of college undergraduates that completed the State-Trait Anxiety Inventory (STAI-T) (N=375; 239 female, mean age = 19.7).

IMR Paradigm:
Subjects viewed a fixation cross-hair for 10-20 minutes while resting. Task instructions were to simply maintain fixation.

IMR Data Acquisition:
Images were acquired on a Phillips Intera Achieva 3.0 Tesla scanner. Resting-state data consisted of 240 sets of 36 axial images (3.5 mm thick, 0.5 mm skip; 3.0 x 3.0 mm in-plane resolution, TR = 2500 ms, TE = 35 ms).

Data Processing: Standard RSFC preprocessing methods were performed similar to Power et al. (2014) Functional images underwent (i) slice timing correction, (ii) rigid body realignment, intensity normalization, transformation to atlas space, demeaning and detrending across each run, regression of nuisance variables across all runs, interpolation of potentially compromised volumes and frequency filtering using a zero-phase 2nd order band-pass Butterworth filter (0.009-0.09Hz) and spatial blurring using a 6mm FWHM Gaussian filter. A frame displacement threshold of 0.25mm was used to identify frames for censoring in all analyses.

Regions of Interest: Individually defined amygdala seeds were created using Friston’s atlas tool (Fischl et al., 2002). Ventromedial PFC was modeled using the region from Kim et al., 2011. To assess connectivity between the amygdala and the vmPFC region, time-courses from each region were correlated with each other and the resulting r value was normalized using Fisher’s Z transformation.

RESULTS

RSFC between right amygdala and vmPFC is inversely related to trait anxiety scores

Sex moderates vmPFC-amygdala relationship with STAI-T

Time between fMRI and survey can influence variance explained

CONCLUSIONS

Amygdala-vmPFC RSFC was inversely correlated with trait anxiety, replicating previous work.

Replication is an important, yet often neglected part of research. Using a large sample allowed us to identify moderating factors and direct future research.

References

Contact: Jeremy.F.Huckins@dartmouth.edu

Supported by NIMH 0911000, NIMH 059292, NIDA 022582, and NSF BCS-0746220.