# Cortical Correlates of Subclinical Antisocial Behaviors

Bhairvi Trivedi[1], Emily Richard[1], Cynthia S. Peng[1], Esha Mehta[1], Caylynn Yao[1], Annchen R. Knodt[2], Ahmad R, Hariri[2], & Gregory L. Wallace[1]

[1]Department of Speech, Language, and Hearing Sciences, George Washington University; [2]Department of Psychology and Neuroscience, Duke University

## Introduction

➢ Antisocial disorders are characterized by impairments in social-emotional functioning and distinct gray matter abnormalities.

➢ However, comorbidities (e.g., ADHD, drug use and abuse, etc.) can often cloud our understanding of the specific contributions of these behaviors to brain-based atypicalities.

➢ Utilizing subclinical antisocial behaviors allows for an unobscured approach to linking brain and behavior.

➢ The present study investigates links between antisocial traits and cortical structure within a large sample of young adults.

## Methods

### Participants

➢ 694 typically developing young adults (280 male:414 female) aged 18-22 years completed the Self-Report Psychopathy-Fourth Edition-Short Form (SRP4-SF), a 29-item scale that provides a Total Antisocial Traits score.

➢ Each participant also provided an MRI scan. Exclusion criteria were the presence of psychiatric and neurological disorders, and MRI contraindications.
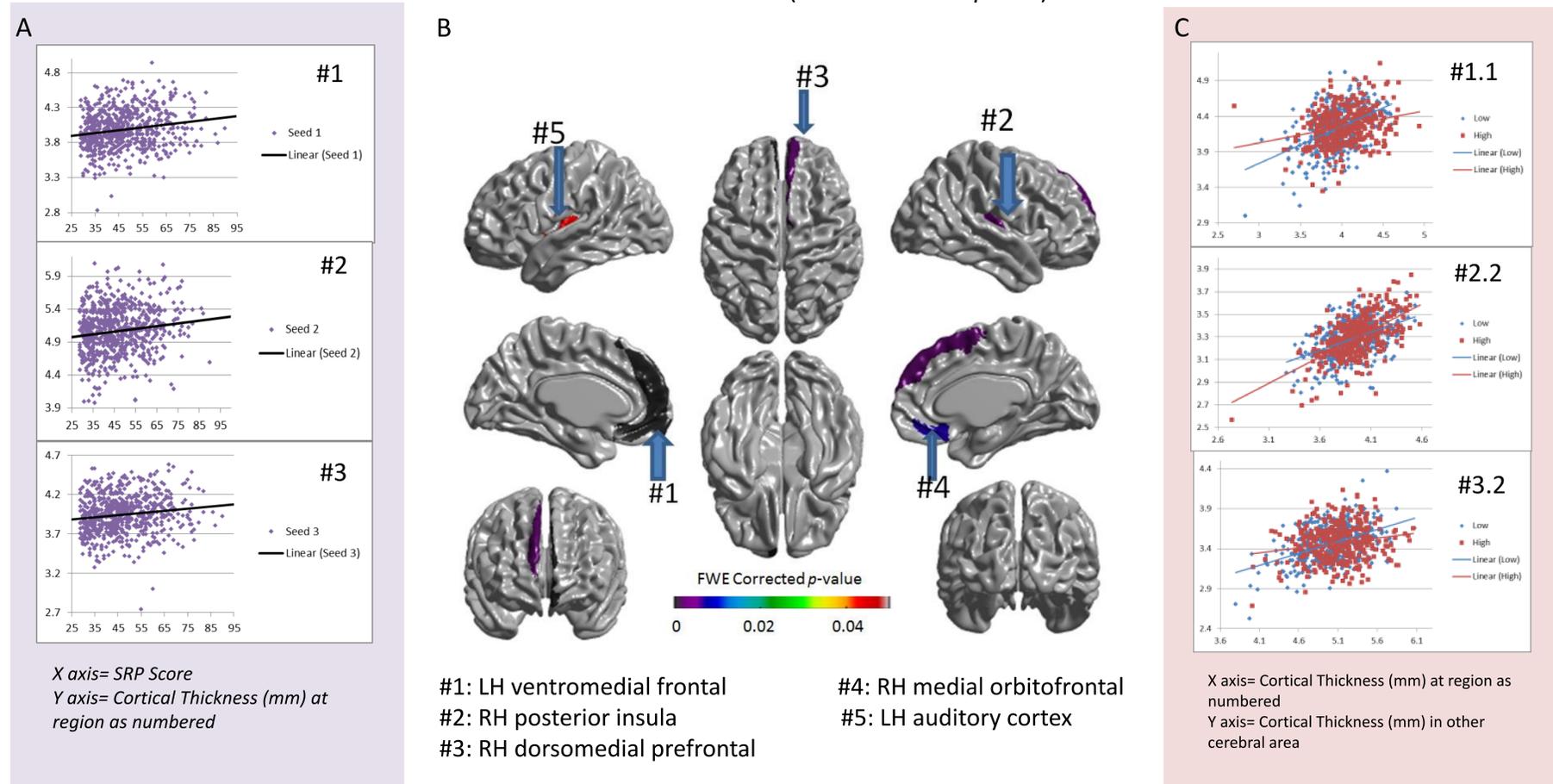
### Image Acquisition & Data Analysis

➢ The CIVET brain imaging pipeline (v2.0) and SurfStat in the MatLab environment were used to derive vertex-level cortical thickness values (>80,000 vertices) and complete analyses.

➢ Statistical analyses included: correlations between SRP4-SF score and thickness and examining how SRP4-SF scores modulate intra-cortical correlations of thickness (Mapping Anatomical Correlations Across Cerebral Cortex (MACACC)).

## Acknowledgements

We would like to thank the volunteers who gave their time to participate in this research.

## Results

Figure 1. (A) Scatterplots of Correlations between Antisocial Traits and Cortical Thickness, (B) Brainmaps of Correlations between Antisocial Traits and Cortical Thickness, and (C) Scatterplots of Regions Where SRP-SF Scores Modulated Intra-Cortical Correlations of Thickness (FWE corrected $p<.05$).



X axis= SRP Score
Y axis= Cortical Thickness (mm) at region as numbered

#1: LH ventromedial frontal
#2: RH posterior insula
#3: RH dorsomedial prefrontal
#4: RH medial orbitofrontal
#5: LH auditory cortex

X axis= Cortical Thickness (mm) at region as numbered
Y axis= Cortical Thickness (mm) in other cerebral area

## Discussion

➢ Broadly speaking, the results showed predominantly thicker cortex in prefrontal areas (e.g., bilateral medial frontal and anterior cingulate cortices) with increasing antisocial traits.

➢ These findings complement the current literature on groups with frank antisocial behavior, which are characterized by atypical cortical thickness in these same areas (Yang et al., 2012; Yang et al., 2015).

➢ Furthermore, they provide support to the notion that these results generalize to subclinical populations, since such social-emotional behaviors are expressed dimensionally in the general population.

➢ These results may aid the detection and classification of neural endophenotypes that will inform not only our understanding of antisocial disorders, but also the etiology (including genetic underpinnings) of individual differences in social-emotional functioning.