Analysis Plan: Assessing the Relation Between Pubertal Stage and Inhibitory Control in an Adolescent Sample

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Study Aim

- The aim of the current study is to assess the relationship between **inhibitory control** and **pubertal stage**

Background

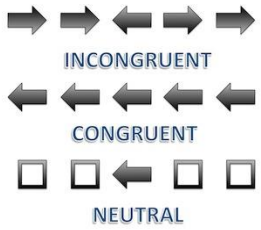
- Effects of prenatal hormone exposure on neurobehavioral development are well-documented
- Less is known about **how pubertal hormones relate to brain development and cognition during adolescence**
- Adolescence is a critical time for the development of brain regions involved in cognition and goal-directed behavior, such as inhibitory control

Dataset

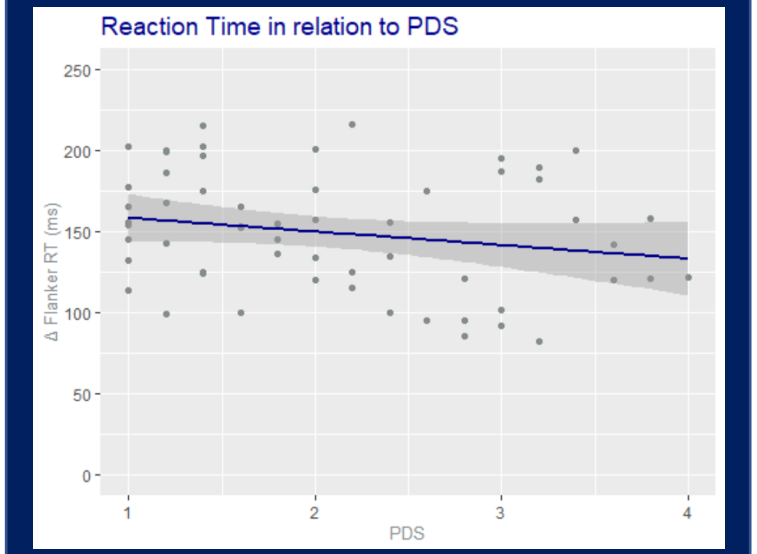
- The Adolescent Brain Cognitive Development (ABCD) study is a longitudinal study of brain development and child health in the US
- ABCD has collected data from 11,880 children **ages 9-10 years old**

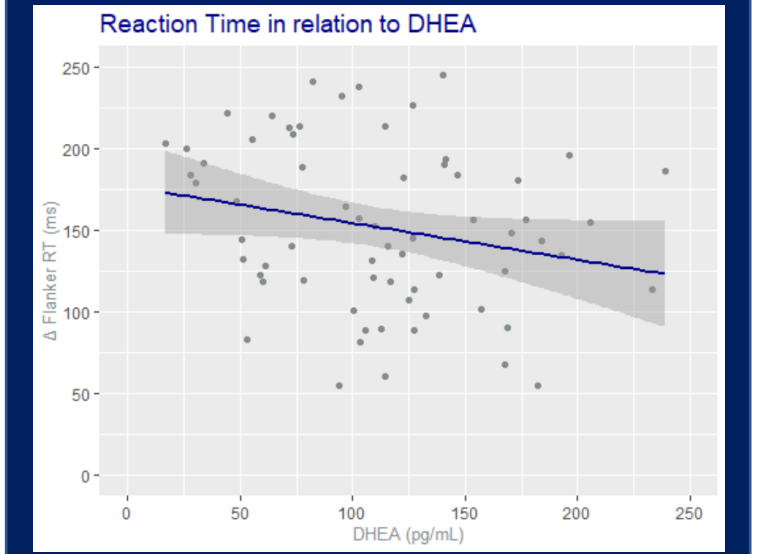
Measures

- Pubertal Stage (PDS): Pubertal Development Status, caregiver report
- Pubertal Hormones Levels: DHEA, Testosterone, and Estradiol (girls only)
- Inhibitory Control: Flanker Control and Attention Test from the NIH toolbox



Predicted Results





Hypotheses

- **Primary Hypothesis:** PDS will be negatively correlated with the difference in reaction time between incongruent and congruent trials in Flanker test, indicating better inhibitory control
- **Secondary Hypothesis:** Pubertal hormone levels will be negatively correlated with the difference in reaction time between incongruent and congruent trials in Flanker test, indicating better inhibitory control

Analysis Plan

- **Step 1:** Pearson correlations will assess the relation between PDS, hormone levels, and RT
- **Step 2:** Regression models will assess relation between PDS, hormone levels, and RT controlling for covariates (age, IQ, sex assigned at birth)

Implications and Future Direction

- Adolescence has been identified as an important period for the development of inhibitory control, but this cognitive function shows substantial heterogeneity in this age range
- This analysis will offer insight into a potential biological mechanism explaining adolescence as a sensitive window for inhibitory control behavior

References

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