

Lindsay Hoyt & Paul Smith: *The Preteen Study: Puberty, Race/ethnicity, and Environmental Influences on Positive Youth Development*

Abstract:

Early pubertal timing is associated with increased risk for social, emotional, behavioral, and physical problems during adolescence and beyond. Most puberty research has been conducted in female, white sample populations; however, puberty may be particularly important to study in African American girls and boys, who experience the biological changes of puberty earlier than the general population. Integrating two distinct lines of scholarly inquiry – biological processes of puberty and race/ethnic minority youths’ psychosocial experiences – we will (a) examine a novel technique to measure pubertal status using non-invasive salivary hormone levels, (b) test whether pubertal status predicts increased discrimination, and (c) explore links between puberty, discrimination, and youths’ academic, psychological, and behavioral outcomes. Approximately 200 African American 4-8th grade students and their primary caregivers will be recruited from two Charter schools in Brooklyn, NY. Students and caregivers will answer a series of survey questions and students will complete a short salivary sampling protocol at home. Additional data on students will be collected from teachers and school records. Objective measures of pubertal status will be measured using Liquid-Chromatography/Mass Spectrometry, a cutting-edge scientific methodology that will enable more precise research on the pubertal transition in young adolescents.

Amy Roy & Gary Weiss: *Quantification of ADHD Behavior using a Smart Cushion and Motion Sensors*

Abstract:

ADHD is one of the most common childhood psychiatric disorders in children worldwide. Assessment of ADHD and many effective interventions rely upon parent and teacher reports of child behavior, which are subjective and thus, subject to bias. For this reason, accurate objective measurement of ADHD behaviors such as hyperactivity that are non-intrusive and low cost, would be a tremendous asset to clinicians. The proposed project leverages Dr. Roy’s research on children with ADHD, and work done by Dr. Weiss’s WISDM Lab on using wireless sensors to improve health, to accomplish two primary aims: (1) to develop a motion detection system that provides accurate assessment of ADHD behaviors; and (2) utilize machine learning algorithms to build a predictive model, to enhance prediction of an ADHD diagnosis. The proposed study will utilize inexpensive wireless motion sensors to collect motion data from children with and without ADHD as they perform a specific set of tasks. We will create and evaluate different smart cushion designs as well as the efficacy of alternate placement and uses of the wireless sensors (e.g., waistband, wristband). Given the great interest in improving healthcare by the use of new smart technologies, this project has great potential for attracting external funding. It also can serve to increase the visibility of interdisciplinary research at Fordham University and encourage the application of new computer technologies, especially sensing technologies, to existing health and neuroscience problems.