

SPiRE-EIT2019



Summer Program for Interdisciplinary Research and Education – Emerging Interface Technologies (SPiRE-EIT)



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Virtual Reality Based Stress Tasks – Is Virtual Stress Real?

Faculty Mentor: Birdie Shirtcliff (Human Development and Family Studies; birdie@iastate.edu)

Mentor: Neil Barnett (Human Development and Family Studies; nbarnett@iastate.edu) Lotte Van Dammen (Human Development & Family Studies, lotte@iastate.edu)

REU Interns: Roselynn Conrady, BradonThymes, Lucas Wright

My laboratory is focused on the impact of stress exposure on biobehavioral health with a focus on adolescents. We examine a range of biomarkers –measures that can be collected from the body which indicate health and wellbeing – from noninvasive biospecimens such as saliva, hair, and cardiovascular sensors/electrodes. These biomarkers have utility because self-reported stress is not related to stress inside the body. For many years, I have supervised student-led and student-involved research that examined whether real-world activities are biobehavioral stressors: skydiving; competitive rugby; roller-coasters; karaoke; haunted-houses; public-speaking; drinking alcohol; electric shock. These activities trigger a cardiovascular and stress hormone response in healthy volunteers with one surprising exception. Since coming to ISU and in connection with the HCI program, my lab has been able to expand this line of research towards virtual reality (VR) based stress tasks. VR opens up the possibility to create a world that is not physically possible yet still taps into our basic stress response. VR also allows my students to administer stress which might not otherwise be ethical in real-world settings, such as walking a plank atop a skyscraper. VR also opens up the possibility to experimentally modify a stressor to probe the underlying stress mechanisms by targeting specific components of the VR environment. My students learn about the fundamentals of stress physiology, are trained on biomarker data collection, and then implement data collection on human participants. HCI students are given the opportunity to create, modify, or implement a VR stressor and then test whether the stressor triggers a stress response. The next steps of this line of research is that the best stress task(s) my students discover will be implemented in future research that examines this stressor in adolescents (who typically cope well with stress), adults with dangerous occupations like correctional officers, and incarcerated youth (who are often stress nonresponders). The long-term goal of this research is to expand the field's understanding of stress and its underlying biobehavioral mechanisms.

<http://research.hs.iastate.edu/spit-lab/>

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