



Health Games Research Round Two Grantees - Project Summaries

Children's Hospital of Philadelphia (Philadelphia, PA)

Project Title: Reward Circuitry, Autism and Games that Teach Social Perceptual Skills

Principal Investigator: Robert Schultz, Ph.D., Clinical Psychologist and Professor, Department of Pediatrics, and Director, Center for Autism Research, University of Pennsylvania School of Medicine

This study tests effects of facial perception games on the brain activity and facial perception skills of 8- to 12-year-old children who have been diagnosed with an autism spectrum disorder (ASD). Children with ASD tend to have difficulty perceiving and interpreting facial expressions and recognizing a person's identity by observing their face. The games used in the study challenge them to notice subtle differences in faces and expressions and give them opportunities to rehearse these skills and receive feedback on their performance. Behavioral testing and use of functional Magnetic Resonance Imaging (fMRI) of players' brains before and after playing the games for 50 hours over the course of eight weeks will help the researchers determine how the games influence facial perception skills and how the brain changes in response to these game experiences.

George Washington University (Washington, DC)

Project Title: Active-Adventure: Investigating a Novel Exergaming Genre in Inner City School Physical Education Programs

Principal Investigator: Todd Miller, Ph.D., Assistant Professor, Department of Exercise Science, School of Public Health and Health Services

This study compares physical, psychological and behavioral effects of three activities: (1) playing Winds of Orbis, a video game that involves an upper and lower body workout as the player moves in order to control a character's movements in the game; (2) playing Dance Dance Revolution, a popular video game that provides a lower body workout as players dance on a pad that detects their dance steps; and (3) engaging in traditional physical education activities at school. Study participants are inner-city African-American and Hispanic students from grades 1-8 who are randomly assigned to the three groups. The study examines various outcomes such as their enjoyment of the activities, attitudes toward physical activity, amount of exercise, and number of calories burned.

Georgetown University (Washington, DC)

Project Title: Wii Active Exergame Intervention for Low-Income African American Obese and Overweight Adolescents

Principal Investigator: Sandra Calvert, Ph.D., Professor, Department of Psychology, and Director, Children's Digital Media Center

This seven-month field experiment randomly assigns obese and overweight urban high school students to (1) play the Wii Active competitively during lunch and after school with the goal of lowering their body mass index (BMI), (2) play the Wii Active cooperatively in a team during lunch and after school with the goal of helping each other reduce their BMI, or (3) have no access to Wii Active during lunch or after school (control condition). The study examines physiological, social, and cognitive outcomes of participants in all three groups to determine whether those who play Wii Active are more physically active; lose more weight; develop greater self-esteem; have more friends; and have better memory, attention and other cognitive skills than those assigned to the control group. The study also examines whether competitive or cooperative game play influences these outcomes the most.

Long Island University (Brooklyn, NY)

Project Title: Dance Video Game Training and Falling in Parkinson's Disease

Principal Investigator: Shaw Bronner, Ph.D., P.T., O.C.S., Director ADAM (Analysis of Dance and Movement) Center

This study compares the use of a commercially available dance pad video game, Dance Dance Revolution, to two traditional treatment options that help people with Parkinson's Disease reduce their risk of falling by increasing their balance, strength, endurance, motor coordination, and visual-motor integration. The two traditional treatments are rhythmic stepping with music and treadmill training with music. The researchers assess balance, motor function, reaction time, and self-confidence to evaluate the game in comparison to the two traditional treatments. They also use functional Magnetic Resonance Imaging (fMRI) to observe participants' brain activity.

Michigan State University (East Lansing, MI)

Project Title: Buddy Up! Harnessing Group Dynamics to Boost Motivation to Exercise

Principal Investigator: Deborah Feltz, Ph.D., Professor, Department of Kinesiology

Research has found that people will work harder with a partner in a strenuous physical task than when working alone, especially if the partner is moderately better at the task. This study provides a virtual partner that engages in exercises with participants on the Eye Toy: Kinetic camera-based video game. College-age study participants are randomly assigned to engage in EyeToy: Kinetic exercises either with a virtual partner or alone. Characteristics of the partner are varied to see which are most effective at improving endurance and exercise time.

Michigan State University (East Lansing, MI)

Project Title: Short-Term and Long-Term Effectiveness of Exergames for Young Adults

Principal Investigator: Wei Peng, Ph.D., Assistant Professor, Department of Telecommunication, Information Studies and Media

This project investigates effects of the Mount Olympus game, a 3D fantasy role-playing game that requires players to move their upper and lower body in order to control their character's movements throughout the world of the game. Overweight and inactive college students participate in the study, which randomly assigns them either to play Mount Olympus or to use a motivational Web site designed to promote and support physical activity. The study examines the extent to which each media activity meets individuals' needs for competence, autonomy and social relatedness, and how meeting these needs may motivate engagement in the activity. More engagement is expected to lead to more physical activity in daily life and therefore to more weight loss and better health outcomes.

Teachers College, Columbia University (New York, NY)

Project Title: Lit: A Game Intervention for Nicotine Smokers

Principal Investigator: Charles Kinzer, Ph.D., Professor, Department of Mathematics, Science and Technology, and Director, Program in Communication, Computing, and Technology in Education

The project will develop and evaluate *Lit: A Game Intervention for Nicotine Smokers*, a smoking reduction game to be delivered on a mobile platform (initially, on the iPod Touch or iPhone). The game is intended to be an alternative to smoking with the goal of reducing or eliminating tobacco use in players' lives. The game involves breathing into a microphone to control gameplay, and is coupled with sound, color, images, challenges and feedback to mimic the stimulant and relaxant effects of smoking. The design elements within the game result in two modes of play ("Rush" and "Relax"). These will be tested for their stimulant and relaxation effects through emotional response and physiological measures (electroencephalogram (EEG), heart rate, galvanic skin response) and compared to subjects after smoking or who play the game in lieu of smoking. If successful, the game will emulate the effects of smoking as a replacement therapy for smokers who want to quit. It will do so by allowing smokers who crave the physiological effects of smoking to reach for this five-minute game rather than for a cigarette. Game design principles, such as those involved in the use of a breath controller with mobile devices, and their application(s) to similar health-related games will also be an outcome of this work.

University of California, San Francisco (San Francisco, CA)

Project Title: A Video Game to Enhance Cognitive Health in Older Adults

Principal Investigator: Adam Gazzaley M.D., Ph.D., Assistant Professor, Department of Neurology, with a joint appointment in the Department of Physiology, and Director, Neuroscience Imaging Center

As people age, they lose some of their ability to sustain their attention and to focus their attention on their main task while ignoring distractions. This study aims to improve these and other related cognitive skills by using a driving game in which players practice paying attention to relevant information, such as traffic signs, and ignoring irrelevant information, such as billboards. The study monitors brain activity with electroencephalogram (EEG) measures and observes eye position and game performance in younger adults (ages 18 to 30) and older adults (ages 60 to 80) before and after six weeks of game play. The study assesses changes in cognitive ability, brain activity and transfer of game-related skills to similar cognitive operations and activities that take place in daily life.

University of Southern California (Los Angeles, CA)

Project Title: Robot Motivator: Towards Adaptive Health Games for Productive Long-Term Interaction

Principal Investigator: Maja Mataric, Ph.D., Professor, Department of Computer Science, and Senior Associate Dean for Research, Viterbi School of Engineering

This study examines the influence of virtual social characters on people's motivation to exercise. Study participants ages 60 and older are randomly assigned to exercise by following the lead of either (1) an embodied character, which is a human-looking robot that demonstrates exercises right there in the room with them or (2) an animated presentation of the same robot on a television screen. The study investigates the role of physical embodiment and social presence on participants' motivation to engage and persist in exercise and physical activity.