

Researcher finds exercise may be intervention for Down syndrome

March 6 2013, by Sarah Auffret



Marcus Santellan exercises on a motorized bike while Katy Lichtsinn, an ASU kinesiology senior, encourages him. Credit: Tom Story

(Medical Xpress)—Marcus Santellan's aunt says he's more talkative at home, using longer sentences, now that he's in an exercise program at Arizona State University. The young man with Down syndrome (DS) is helping ASU researchers find out whether intense, assisted exercise can improve cognitive, motor and emotional functioning in adolescents with DS.

Marcus swings his legs down from the motorized bike with a groan after a half-hour session, but he's exhilarated. He is one of eight participants who come to the Tempe and Downtown Phoenix campuses three times a week to work out on a bike. Another eight have already completed the study.

Katy Lichtsinn, an ASU [kinesiology](#) senior who acts as his cheerleader and mentor, warns his aunt that Marcus might be tired after pedaling at 110 rpm.

"I'm not tired," says Marcus, taking a gulp from a water bottle. "But I can't feel my legs."

Persons with DS, a chromosomal condition that affects about 400,000 children born in the United States, have broad [cognitive impairment](#) and physical characteristics that limit their ability to perform functional tasks of daily living. To date, there have been few, if any, [behavioral interventions](#) that have been shown to bring about improvement in their functioning.

Shannon D.R. Ringenbach, an associate professor of kinesiology in the School of Nutrition and Health Promotion, hopes to show that Assisted Cycle Therapy has the potential to improve the lives of people with DS. She has received a \$150,000 grant from the Eunice Shriver National Institute of Child Health and Human Development to conduct the study.

A smaller [pilot study](#) she carried out two years ago revealed that adolescents with DS improved their speed of information processing and [manual dexterity](#), even after one Assisted Cycle [Therapy session](#). The same was not true after one voluntary [exercise session](#), since people with DS tend toward [sedentary behavior](#) and have reduced strength.

An innovation in Ringenbach's approach is the use of a specialized stationary bicycle with a motor, so participants exercise faster. Assisting in the research are about 15 ASU undergraduates and one doctoral student, who monitor the participants carefully and urge them on. Participants are tested periodically on their functional behaviors, manual dexterity, executive function and depression.

"It's really remarkable that by doing this kind of exercise, they begin to think faster," says Ringenbach. "We believe they develop new brain cells. We don't know yet how long it will last. But it has the potential to dramatically change the quality of their lives. With early intervention in children with Down syndrome, it's possible it could improve their IQ."

Exercise has been shown to improve cognitive, physical and mental health in people with Parkinson's disease.

Marcus' aunt, Georgina Rosas, has been caring for him along with her sister since he was six months old. He graduated from Tempe High School last year, and has been active in Special Olympics. Rosas enrolled him in the ASU study in hopes it would help him think a little faster. She wishes there were more interventions for people with DS.

"A lot of [Down syndrome](#) children are smart and able to learn to do things, but they get left behind, in the research," she says. "He is well loved, with two devoted aunts. But it's nice to have people at the university who are looking into this."

Participants' families tell Ringenbach that their children enjoy the program a great deal. They are talking and interacting more, their moods are better, and they'd like the program to continue. She hopes to extend her research by developing a motorized bike for smaller children, and perhaps to develop a program for DS individuals at the downtown YMCA.

Provided by Arizona State University

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