The Simmons Family Foundation is betting on the power of brain science to revolutionize one of our nation’s most pressing concerns – education of our youth. They have invested $2.5 million to implement programs, developed at the Center for BrainHealth, across Texas to create a model for national education reform.

Worldwide, the United States has fallen from number one in high school graduation to number 22 out of 27 ranked countries, according to the Organization for Economic Co-Operation and Development (OECD). Domestic advances are failing to compete with other developed countries that have worked aggressively on education reform. Curricula in top performing countries have evolved to emphasize creative thinking, problem solving and the ability to innovate, an OECD report points out.

U.S. Education Secretary Arne Duncan emphasizes, “I think in other countries, there’s a greater understanding that education is the path to a middle-class life. And somehow we have to get back that sense of urgency, that commitment that other countries have.”

The Simmons Family Foundation gift to the Center for BrainHealth’s Brain Performance Institute aims to help bring the U.S. back to its former global esteem. Priming tweens for high school success, the generous donation will be used to integrate scientifically-proven high performance brain training, known as SMART, into several public middle schools of low socioeconomic status across Texas beginning in fall 2014. Moreover, it will provide extra support to students affected by two issues also in the national spotlight: the growing number of children diagnosed with Autism Spectrum Disorder (ASD) and the 20% increase in bullying in the last 10 years.

“The Simmons Family Foundation is dedicated to affecting change on important issues,” explains Lisa Simmons, trustee of The Simmons Family Foundation. “Transforming our education system is at the top of the list, and we believe the SMART training is vital to teach middle school students to learn and think strategically. With the number of young people facing social challenges, such as bullying, on the rise, the opportunity to promote social and emotional well being really appealed to us.”

The two programs will be delivered on a wide scale and are based on decades of research. Both inspire creative, insightful and resourceful thinking and are proven to strengthen the part of the brain responsible for critical thinking, reasoning, decision-making and problem solving – key aspects necessary to compete on an international level.

“With the campus-wide approach, SMART will be infused into the school’s culture and curriculum,” says Jacque Gamino, Ph.D., Director of the Center for BrainHealth’s Adolescent Reasoning Initiative. “When students are inspired to be involved in the learning process, innovation and creativity lead to engagement and academic success. Involving entire faculties and parents in the SMART program helps bolster student achievement.”

The social cognition program targeting those involved in bullying, individuals with an ASD diagnosis and other teens who face significant social challenges will be made available to students based on teacher recommendation. The cutting-edge virtual reality program, complete with personalized avatars and face tracking software, is a safe learning environment disguised as a fun video game that allows participants to triumph at real-life situations such as peer pressure, disagreements and building friendships.

Dr. Gamino and Sandra Chapman, Ph.D., the Center’s Founder and Chief Director, recently visited with officials in Secretary Duncan’s office to discuss scalability and future prospects for SMART on the national level. “We are grateful to The Simmons Family Foundation for the opportunity to expand these proven programs,” says Dr. Chapman. “Expanding SMART on this scale not only improves the minds of more students, but also continues to validate our research and the program’s potential to have a monumental impact on the U.S. education system.”
According to the President’s Council on Fitness, Sports and Nutrition, only one in three adults engage in the recommended amount of physical exercise each week. Their lack of activity deprives them of diverse health benefits ranging from short-term elevations in mood, energy, and quality sleep to more systemic benefits such as weight control and disease prevention. However, new findings from scientists at the Center for BrainHealth, in partnership with The Cooper Institute, show that exercise improves brain function and boosts memory — news that may finally motivate people to get up and move their feet as an incentive to prevent Alzheimer’s disease later in life.

**In this novel study, researchers discovered that aerobic exercise stimulates positive brain change and memory gains more quickly than previously thought possible.** Published in Frontiers in Aging Neuroscience, the findings show that cardiac exercise improves memory in adults ages 57 and 75 who added regular aerobic exercise to their routine experiences benefits in brain health and physical fitness within three months, half the time of previous studies. Three times a week for 12 consecutive weeks participants were required to complete supervised, one-hour-long aerobic workouts (e.g., treadmill or stationary bike) until exhaustion. Imaging results revealed increased brain blood flow and allowed the team to identify specific brain areas involved in the memory improvements documented on cognitive tests. “There are two key findings in the current study,” said Sina Aslan, Ph.D., founder and president of Advance Brain Health. “First, the anterior cingulate, which has been linked to superior cognitive performance in life, showed higher blood flow and second, the hippocampus blood flow increase, which may prevent Alzheimer’s disease, predicted memory gains.”

Although the ability of aerobic activity to quickly enhance memory and potentially stave-off Alzheimer’s disease is impressive, changing the way you think offers far more robust brain gains. In another recent BrainHealth study published in Cerebral Cortex, study participants ages 56 to 73 years of age experienced significant cognitive changes and improvements in brain health after only 12 hours of directed brain training over the same 12-week time period. Regional and global gains in cerebral blood flow were accompanied by increased brain metabolic rate, which is the wiring of the brain that allows information to travel between brain cells, and increased speed of neural processing. Furthermore, important brain networks functioned more efficiently. Consistent with these memory changes, brain imaging in participants with GWI revealed a pattern of neural response across important brain networks, a function that allows information to travel between brain cells, and increased speed of neural processing. Consistent with these memory changes, brain imaging in participants with GWI revealed a pattern of neural response across important brain networks, a function that allows information to travel between brain cells, and increased speed of neural processing. This research demonstrates that exercise can enhance brain performance and provides the hope that individuals can improve memory capacity and cognitive brain health by habitually utilizing higher-order thinking strategies and engaging in aerobic exercise no matter their age.

**Unique Brain Changes Identified in Veterans with Gulf War Illness**

Approximately 25% of those deployed during the First Persian Gulf War, more than 250,000 veterans, have been diagnosed with Gulf War Illness (GWI). Although medical professionals have acknowledged the potential for serious long-term health effects, the causes of GWI have yet to be fully understood. Novel findings from a study recently published in Clinical Psychological Science by Center for BrainHealth researchers Dr. Bart Pyraga and Nick Hubbard, along with nationally recognized GWI expert Robert Haley, M.D. of UT Southwestern Medical Center, positively confirm deficits in working memory and reveal a neurobiological marker unique to the illness. Compared to matched controls, study participants with GWI demonstrated diminished brain capacity in three components: working memory, the ability to adapt and switch between tasks; attention, the ability to filter distractions and maintain focused attention; and speed of information processing. Consistent with these memory changes, brain imaging in participants with GWI revealed a distinct biomarker that could serve as a way to diagnose the illness and test for treatment efficacy. These findings may hold implications for other disorders that give rise to cognitive impairment, including Alzheimer’s disease.

**Addiction Study Looks at Brain Connectivity in Marijuana Users**

A new study published in a special edition of The American Journal of Drug and Alcohol Abuse, guest-edited by Center for BrainHealth’s Francesca Filby, Ph.D., is shedding light on how marijuana use may shape brain connectivity. “Many studies have shown how people who use marijuana, who don’t, with marijuana being so prevalent and, yet, only approximately 10% becoming dependent, it is even more important to address what puts individuals at risk,” said Filby, the study’s lead investigator. For the study, an arrow cued participants to press a button as quickly as possible — except when a tone sounded. Interestingly, results showed no activation differences in the relevant brain regions of addicted users and recreational users. However, the researchers’ findings revealed greater connectivity between the brain regions of addicted users than those who use substances recreationally. Among many potential explanations of these findings, Dr. Filby suggested that the hyper-connection may be exhausting energy from the control regions causing decreased self-control.

**A Child’s Brain:**

A new study published in online in Brain Connectivity and Cognition shows that the Center for BrainHealth’s SMART program does more than just improve performance; it improves core brain functions essential for academic achievement and daily living. The program focused on teaching teens strategies to “get the gist” of difficult information and improve comprehension, reasoning and problem-solving. For the study, middle school students ages 12 to 15 were shown visual images that cued them to press a button as quickly as possible or in new situations that required them to withhold button pressing. The test, designed by the Center’s Heather Motes, Ph.D., the study’s lead author, “The results demonstrate the potentially broad implications of teaching higher-level thinking skills to students in general but also to certain groups who have trouble with inhibitory control such as students with ADHD.”

**Brain Performance Institute**

Cross-train Your Brain: Adding a brain boost to your next aerobic workout is as simple as removing tension from service to civilian life. workout is as simple as removing tension from service to civilian life. The American Journal of Drug and Alcohol Abuse
Leadership Legacy

For Betty Lu Slaughter Williams, matters of the brain and helping those in need were always of upmost importance. “My mother was passionate about many causes, but no cause was more dear to her heart than advocacy for those with mental health challenges,” her daughter Linda Perryman Evans said.

“She worked tirelessly to help secure mental health services for incarcerated men and women beginning at a time when most individuals with mental health challenges were not receiving adequate or even humane care.”

In her honor, Betty Lu’s loving husband Joel Williams, Jr. and Linda Evans have donated $1 million in support of the Center for BrainHealth’s Brain Performance Institute building capital campaign.

“Betty Lu spent her life dedicated to helping the community. Investing in the Brain Performance Institute fulfilled two of our interests: supporting medical research and truly transforming lives,” explained Joel. “Brain-related causes are important to our family, and we wanted to be one of the first to make a substantial gift to this innovative institute.”

“Betty Lu’s smile could light up a room. It was always a joy to see her,” said Center for BrainHealth board chair Debbie Francis. “Her vivacious, infectious spirit and unwavering dedication to mental health will inspire us for years to come through the Brain Performance Institute.”

The RGK Foundation Takes High Performance Brain Training Program to Central Texas

The RGK Foundation’s continued endeavor to improve society by advancing knowledge and realizing human potential inspired its latest $500,000 gift to the Center for BrainHealth. The generous grant will expand existing high performance brain training programs for former and current military service members and middle school students in the Central Texas area. Known as Warrior SMART and Adolescent SMART, the Center for BrainHealth initiatives, working in partnership with its translational arm, the Brain Performance Institute, will help these two groups of students who are experiencing significant life transitions achieve cognitive gains that maximize their real-world potential.

Support from the RGK Foundation for the Adolescent SMART program will install a regional liaison in Austin. “A similar position has been piloted in Florida, but this will be the first regional liaison for Texas. The continued expansion of the Adolescent SMART program is important for advancing the Center’s goal to increase student achievement and reasoning ability, regardless of socioeconomic status, in areas across Texas,” explained Jacque Gamino, Ph.D., Director of the Adolescent Reasoning Initiative. The Austin liaison will help maintain the program’s fidelity, providing support to teachers who have been trained at the Center for BrainHealth to implement Adolescent SMART in their middle school classrooms and collecting data. The liaison will also serve as a regional contact for school district administrators to help establish SMART programs in more Central Texas schools.

The RGK Foundation’s support for the Warrior SMART program will fund additional training team personnel for deployment to Central Texas, a hub of military bases and veteran service agencies. “We are grateful for RGK’s support in this strategic move that will help us reach one of the highest concentrations of veterans and active-duty service members in the United States,” said Matthew Neyland, Head of the Warrior Training Team and former U.S. Marine Corps Officer. “Our training leverages leadership and strategic thinking skills learned in the military, bridging the transition from the battlefield to civilian life.”

“These programs are based on compelling research that show individuals who complete SMART demonstrate improved cognition and brain health,” explained Director of Development Kimberly Hartmann. “Initiatives like this one in Central Texas help propel us toward our goal of helping millions of people achieve better brain function within the next several years.”


The Brain: An Owner’s Guide, the Center’s annual sell-out lecture series made possible by the generosity and vision of The Container Store, will once again deliver groundbreaking brain health research straight from renowned leaders in the field every Tuesday night in February.

Tickets on Sale Now • Visit CenterForBrainHealth.org

Thank you to the numerous donors whose support funded the research appearing in this edition of Brain Matters.

- ATT Foundation
- Crystal Charity Ball
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- Sapphire Foundation
- The Simmons Family Foundation
- Sparrow Foundation
- T. Boone Pickens Foundation
- Texas Legislature

In Memory of Lawrence Eliot “LaWrie” Marcus

July 5, 1917 - November 1, 2013

“Lawrence Marcus’ steadfast spirit of brain innovation, tenacity and humor benefited our city and the nation,” said Sandra Chapman, Ph.D., the Center’s Founder and Chief Director. “He had the kind of mind we all stand in awe of.”

Lawrence Marcus was the last of the generation that built the Neiman Marcus retail chain. A decorated war hero, arts and culture enthusiast, and beloved family man, he wielded diverse interests and talents. “He was a man who was interested in everything especially meeting new people. He never stopped learning or thinking,” said his wife, Shelby Marcus.