The energy maven gathered change-makers from across the country at his Mesa Vista Ranch near Amarillo to learn, discuss and consider the challenges facing brain health today and – most importantly – the solutions. Center for BrainHealth leadership and international collaborating experts shared a bold vision for the next decade of brain health and performance advances.

"UT Dallas’ Center for BrainHealth is the premier place to get answers about the brain. It’s not just about when something is wrong anymore," said Mr. Pickens. "They are discovering specific ways to guide us toward how to strengthen our brain at any age – how to be proactive and build capacity and be more cognitively resilient."

The meeting at the ranch signified the official start of the race to catch brain health standards up to those of heart health. According to Dr. Sandra Bond Chapman, Center for BrainHealth founder and chief director, their ambitious goal requires breaking from traditional research approaches to aggregate and garner transformative perspectives, advocates and collaborators.

"Boone is a forward-thinking and impactful philanthropic partner. At 89 years old, he is a prime example of how one can keep their brain young and is an advocate for starting a brain-healthy lifestyle at a young age and never ceasing," explained Dr. Chapman. "We are envisioning an ambitious global enterprise that would revolutionize the way the medical field, and society at large, thinks and acts about their brain health."

Currently, brain-focused vital signs do not exist. Establishing target norms for brain health, akin to vital signs of heart health such as heart rate, respiratory rate, pulse oxygenation and blood pressure, is crucial to preventive brain medicine.

"Advances in brain health are poised to improve society in unprecedented, historic ways. Science has never been better prepared. Society has never been more in need," said Tom C. Leppert, former CEO of Turner, Kaplan, and Castle & Cooke Properties, and Dallas mayor from 2007 to 2011. Mr. Leppert was on hand at the gathering.

"We will create the world’s first standardized Brain Health Vital Signs. We will use the Brain Health Vital Signs to determine those modifiable brain health factors that will enable optimization of one’s brain health throughout life. The Brain Health Vital Signs and identification of modifiable brain health factors will drive a revolution in brain health awareness and actions comparable to advances in heart health," said Geoffrey Ling, a leading collaborator in this initiative and a world-renowned neurologist who holds appointments at Johns Hopkins and the Uniformed Services University of the Health Sciences and serves as acting vice chair for research at Inova.

"Age-related mental decline is considered normal only because we haven’t known how to prevent it," said Dr. Ling. "What we are envisioning would fundamentally change the way we expect our brains to age."

To make this vision possible, collaborators are being engaged from across the nation and around the world. They represent various disciplines, including cognitive neuroscience, medicine, neuroscience, computational analytics, brain imaging, the microbiome, neuroplasticity, genetics and epigenetics, sleep, stress, exercise physiology, and nutrition.

"We have a series of protocols and interventions that are proven to enhance brain function," said Dr. Ian Robertson, T. Boone Pickens Distinguished Scientist at the Center for BrainHealth and co-director of the Global Brain Health Institute. "We will leverage and expand these to apply what we know to learn more; we will apply this knowledge on a global scale to benefit humanity’s greatest asset – their brain health."
As scientists at a translational research institute, we approach research through a unique lens: how to create solutions that help people today. Lately, we have magnified this lens to envision a new model of brain care, one that is personalized and focuses on building brain resilience. As cognitive neuroscientists, we reimagine, discover and implement ways to increase the longevity, and strengthen the health, of our brains. It is an ambitious undertaking. We are doing this with dedicated collaborators across diverse disciplines.

To that end, in this edition of BrainMatters, we celebrate meaningful collaborations focused on a bold vision. We recount a gathering of brain health change-makers, highlight visionary philanthropists T. Boone Pickens and Robert Meadows as well as salute the young professionals of the Think Ahead Group who represent a vibrant community that recognizes the lifelong importance of brain health throughout all segments of society. We commemorate UT System Chancellor McRaven’s commitment for Texas to lead the Brain Health Revolution and share research advancements that would not be possible without major philanthropic and strategic partnerships. Finally, in honor of summer, we appreciate our teachers and their tireless dedication to creating the next generation of great problem-finders and solvers. We offer a few brain tips to ensure your brain health stays at the top of its game over the summer.

Without brain health, we do not have health.

To unlock brain potential across the nation and around the world, we want to make sure that our nation’s heroes have access to the latest brain science has to offer – at no cost to them.

Here are a few programs that we believe will help make that difference:

- Programs that equip teachers and administrators with strategies to increase classroom engagement and standardized test-passing rates, teaching students how to learn – not what to learn
- Brain training and assessments for civilians and corporations that are committed to thinking more efficiently and effectively and becoming more productive and innovative
- Virtual environments that help students and young adults who may have a hard time making friends or struggle socially when interacting with peers
- Strength-based interventions for individuals and caregivers who are looking to remain cognitively strong as long as possible after an Alzheimer’s or dementia diagnosis

With the grand opening of the Brain Performance Institute, we look forward to offering not only these programs but also educational talks, workshops, the latest in research news and practical tips on how to take your brain to the next level.

The Brain Performance Institute is on a mission to tap into an individual’s propensity for high performance, and we will continue to develop brain science innovations that help you think, work and live a more fulfilling and vibrant life. We hope you will continue on this exciting journey with us.

Sincerely,

Sandra Bond Chapman, PhD
Founder and Chief Director
Center for BrainHealth

Leanne R. Young, PhD
Executive Director
Brain Performance Institute

As we approach Independence Day and plan for our grand opening in October, we are thinking about how the Brain Performance Institute™ can do its part to incite national change from Dallas, Texas.

One of the most frequent questions I have been asked since I became executive director of the Brain Performance Institute is, “Do you plan to continue offering services for warriors and their families?” The answer I always give is an emphatic yes! Serving our military members, first responders and their families is fundamental to our identity as an organization. While we aspire to make sure that our nation’s heroes have access to the latest brain science has to offer – at no cost to them.

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Sincerely,

Leanne R. Young, PhD
Executive Director
Brain Performance Institute

The Brain Performance Institute’s new building is nearly move-in ready. The grand suspended staircase, a dramatic focal point of the ellipse that connects the lobby level to the second and third floors, has been completed, and the lobby’s beautiful arched wood ceiling is now finished. Later this summer, furniture and art installations will round out the finishing touches in anticipation of the grand opening in October.

Sincerely,

Leanne R. Young
Dr. Xiaosi Gu and Dr. Francesca Filbey are taking a new approach to discover what causes craving in the brain.

GETTING TO THE BOTTOM OF CRAVING IN ADDICTION AND BINGE EATING

A new article in JAMA Psychiatry details the first step in revealing how craving works in the brain. Scientists at the Center for BrainHealth™ are the first to propose a systematic and quantitative model for drug addiction research. The model focuses on craving: the intense, urgent feeling of needing or wanting drugs. Their ongoing research and subsequent findings have the potential to open a new frontier of alcohol and substance abuse treatment that may also apply to binge-eating disorders.

"Craving is considered one of the strongest predictors of relapse," said Dr. Xiaosi Gu, who runs the Computational Psychiatry Unit at the Center for BrainHealth. "Even after an individual has broken the cycle of compulsive drug taking, craving can still persist. Although current treatment can handle a lot of the behavioral aspects of addiction, especially physical symptoms, craving is difficult to treat because it is a subject state. For example, when you are hungry, you have the urge to eat, but it is difficult to measure how compelling your urge to eat is in a quantitative way. However, if we could visualize craving activation in the brain, we would be better able to quantify and target it. We aim, with this new framework, to begin to separate craving from reward- or drug-seeking behavior."

Research on drug craving has traditionally centered on studying cue response. For example, a marijuana study participant typically undergoes a brain scan while being shown a picture of a bong, and researchers analyze the brain activation in response to the cue. In this scenario, the bong is a valuable item to someone who uses marijuana. However, as Dr. Gu points out, there is no way to know whether the brain activation occurs in response to the reward (an item associated with smoking marijuana) or the craving (the bong image triggers craving for marijuana).

Dr. Gu and Dr. Francesca Filbey, also of the Center for BrainHealth and Bert Moore Chair at BrainHealth, are collaborating to identify – using a new computational model – the exact regions of the brain that encode craving. They plan to reanalyze brain scans from previous research to lay the groundwork for quantifying craving, its effects and ways to target treatments to counteract it.

Initial results are promising, but it will take a few years and additional funding to complete reanalysis of the thousands of brain scans previously compiled through Dr. Filbey’s research as well as data from consortia to which Dr. Filbey belongs.

Funding for this study is supported by a start-up grant from UT Dallas, a Dallas Foundation grant to Dr. Gu and a National Institutes of Health grant to Dr. Filbey (RO1 DA030344).
FIRST-EVER SMART THINK TANK FOR ADOLESCENTS

Center for BrainHealth™ experts banded together with several Dallas public middle schools to bring together kids who are all trying to accomplish the same thing – think SMARTer.

This spring 80 sixth, seventh and eighth graders from four different Dallas middle schools attended the first-ever SMART™ Think Tank at the Center for BrainHealth. These SMART Community Schools – so named because of their school-wide participation in BrainHealth’s Adolescent Reasoning Initiative – included Sarah Zumwalt Middle School, Piedmont G.L.O.B.A.L. Academy, Raul Quintanilla Middle School, and T.W. Browne Middle School. The event gathered students from each school’s SMART Club, an after-school group comprising students who want to practice the thinking skills they learned from BrainHealth’s Strategic Memory Advanced Reasoning Training (SMART).

During the SMART Think Tank, students divided into teams to engineer a protective casing for an egg-drop competition. They listened to a presentation on concussion science and then built on what they had learned from the competition to design and present ideas for new helmets. Students toured BrainHealth to learn about the brain, how EEG and fMRI are used in research, and experienced the latest immersive virtual-reality technology used to develop new cognitive training programs at BrainHealth.

“This is a chance for students who have been through the SMART program to practice the cognitive processes that help them think at a deeper level,” explained Dr. Jacquelyn Gamino, SMART co-creator and director of the Adolescent Reasoning Initiative. “These are all kids who are potentially destined for greatness and who are interested in promoting their own brain health and their cognitive abilities,” said Dr. Gamino. “Many of them may not think they’re very good at school, but the SMART program helps them understand how best to learn, and they have the tools to succeed academically as a result.”

Since its inception in 2009, the Adolescent Reasoning Initiative has been tested, implemented and expanded to include more than 50,000 youth, 300 teachers and 125 administrators in five states. Participating teachers are trained in the principles of SMART, which helps students develop skills for how to learn, instead of what to learn.

Students who have completed the classroom-based SMART curriculum and want to do more with the strategies are invited to participate in an after-school group to practice their learning skills.

“We want to help students become the innovators of the future,” explained Janet Koslovsky, an assistant director of the Adolescent Reasoning Initiative. “We want them to have confidence in their ability when they get out of school or go on to college or vocational school; our goal is for them to be successful contributors in whatever they choose.”

Major funding over the past nine years includes the support of the state of Texas and the American Recovery and Reinvestment Act (ARRA) in addition to generous funding from the Simmons Foundation, the T. Boone Pickens Foundation, The Meadows Foundation, the Sparrow Foundation, the Communities Foundation, the RGK Foundation, Capital for Kids, the Harry S. Moss Foundation, the Fortin Foundation, and the AT&T Foundation.

SUMMER BRAIN TIPS FOR PARENTS

1. Limit the amount of screen time your children have and encourage activity. (Including video games, TV, movies, computer and phone)
2. Set a good example with your children and limit your own screen time.
3. To inspire thinking skills and creativity, when you read to your children, ask questions such as:
   - “How do you think the character is feeling?”
   - “What do you think will happen next?”
   - “If you were the author, how would you change the story?”

SMART Teacher Training

Limited spots are still available for:

SMART Teacher Training July 10-14 | July 24-28
Leadership/Administration Training July 27, 2017

Send an email to bhSmartEd@utdallas.edu or call 972.883.3247 for additional information about the Adolescent Reasoning Initiative and how to bring this program to your public school’s students.

centerforbrainhealth.org/programs/ari
Students who participated in the Center for BrainHealth’s Strategic Memory Advanced Reasoning Training™ (SMART) program during the 2015-2016 school year demonstrated concrete gains in standardized test scores. Eighth-grade students who received SMART passed the STAAR® at nearly double the rate of students at the same school who did not receive SMART. Results reflect a dramatic difference in standardized test passing rates in reading, math, science and social studies.

*STAAR stands for the State of Texas Assessment of Academic Readiness and is required for graduation from Texas high schools.

WE ASKED. YOU ANSWERED.

What does "brain health" mean to you?

We asked a group of high school and college summer interns and a group of people already in the workforce, “What does brain health mean to you?” They gave two very different sets of responses.

Can you guess which group created which cloud?

See the answer below.

Let us know what brain health means to you at: BrainMatters@UTDallas.edu
TRAUMATIC BRAIN INJURY: TRAINING CHANGES BRAIN STRUCTURE AND FUNCTION

A recent study from the Center for BrainHealth™ shows that a certain type of instructor-led brain training protocol can stimulate structural changes in the brain and neural connections even years after a traumatic brain injury (TBI). Building on previous research, the study challenges the widely held belief that recovery from a TBI is limited to two years after an injury.

The findings, published in Brain and Behavior, suggest that changes in cortical thickness and neural network connectivity may prove an effective way to quantitatively measure treatment efficacy, an ability that has not existed until now.

“For people with chronic TBI, they may have trouble with daily tasks, such as creating shopping lists and resolving conflicts with others, for many years after the injury,” said Dr. Kihwan Han, research scientist in the lab of Dr. Daniel Kravczyk at the Center for BrainHealth and lead author of the study. “These findings provide hope for people who thought, ‘This is as good as my recovery is going to get’ and for the medical community who have yet to find a way to objectively measure a patient’s recovery.”

The study included 60 adults with TBI symptoms lasting an average of eight years. Participants were randomly placed into one of two cognitive training groups: strategy-based training or knowledge-based training. Over an eight-week period, the strategy-based training group learned strategies to improve attention and reasoning. The knowledge-based training group learned information about the structure and function of the brain as well as the effects of sleep and exercise on brain performance.

Magnetic resonance imaging revealed greater changes in cortical thickness and connectivity of individuals in the strategy-based reasoning training compared to the knowledge-based group. These structural changes positively correlated with an individual’s ability to switch between tasks quickly and consistently to achieve a specific goal. “People who showed the greatest change in cortical thickness and connectivity showed the greatest performance increases in our cognitive tasks. Perhaps future studies could investigate the added benefit of brain stimulation treatments in combination with cognitive training for individuals with chronic TBI who experience problems with attention, memory or executive functions,” Dr. Han said.

The work was supported by the Department of Defense, The Meadows Foundation and the Friends of BrainHealth Distinguished New Scientist Award.

IN CELEBRATION OF A PASSIONATE LIFE

In memoriam: Dana Juett, 1947-2017

In an interview with the Center last year, Dana said, “Giving little bits and pieces of help along the way to those who have the drive and desire can make a huge difference not only in their lives but for generations to come — that’s what we hope our efforts at the Center for BrainHealth will do.”

Through his dedication and passion for investing in others at pivotal life moments, the legacy of Dana Juett will live on in the work of those he so generously supported. Along with his wife, Kate, he contributed time, effort and financial support, helping many rise to the top and succeed. For example, since 2013, the Sapphire Venture Leadership Residency, which was named in honor of Dana, is a nine-month educational program for budding young philanthropists. It examines social issues, offers workshops and provides tutelage for nonprofit and for-profit executives.

We are extremely grateful for Dana and Kate’s leadership and philanthropic efforts over the years,” said Dr. Sandra Chapman, founder and chief director of the Center for BrainHealth. “He was truly inspirational. He encouraged others to help in any way whenever they could. He knew the work being done here was vital for each of us, the community as a whole and the future.”

CARRY THE LOAD

Brain Performance Institute™ team members showed their support at the Carry The Load Dallas Memorial March, an event that helps restore the true meaning of Memorial Day by honoring service members and their families who have made the ultimate sacrifice. A portion of funds raised from this year’s Memorial March will expand the reach of the Center for BrainHealth’s Brain Performance Institute programs, helping military service members, first responders and their families unlock their brain potential.
The Meadows Foundation has made a generous donation of $1 million to support the creation of an imaging suite for the Brain Performance Institute’s new building.

For Robert Meadows, the importance of maintaining brain health is both a personal and professional cause. Having walked alongside a loved one struggling with mental illness, he knows how devastating the effects can be. And as chairman of the board of trustees at The Meadows Foundation, whose work to address gaps in mental health care manifested in the 2014 creation of the Meadows Mental Health Policy Institute, Meadows is uniquely attuned to the need for quality, accessible mental health-care services — as well as the need to reframe the public’s perception.

“A lot of people in society still think that mental illness is a choice, but it is a medical problem,” he said. “Once you have witnessed it, you realize how much the stigma needs to be eliminated and how much work needs to be done to help those affected and their families.”

As mental health and brain health are inexorably linked, researchers at the Center for BrainHealth™ and its Brain Performance Institute have a keen interest in understanding the markers of a healthy brain and the neural mechanisms that underlie many mental illnesses. Armed with this knowledge, the Brain Performance Institute will be able to help those struggling with brain diseases or mental illness now, not a generation from now.

People who have psychological or emotional challenges face enough hurdles,” Meadows said. “They don’t need improving their brain health to be complicated.”

To further these goals, the Brain Performance Institute will have a dedicated on-site imaging suite thanks in part to the generosity of Robert Meadows and The Meadows Foundation. In 2016, The Meadows Foundation contributed $1 million toward this suite.

“The ability of these new scanners to map connectivity at a high resolution over the whole brain will provide us with much greater detail about how the healthy brain works, ultimately enabling the pursuit of our long-term research goal of discovering the markers of brain health,” explained Dr. Daniel Krawczyk, deputy director of the Center for BrainHealth. “Higher-quality scans will enable us to make more accurate predictions from the data collected, setting the stage for better and more informed treatment plans for specific brain diseases or injuries, which can ultimately be shared with research institutions and medical facilities around the world.”

By bringing the most advanced imaging technology and talent available to its campus, BrainHealth will propel its initiatives in health, injury and disease — including mental health — even further.

“Robert is visionary in his philanthropic efforts. He understood our long-term goals and truly championed our request for support of the Brain Performance Institute’s imaging suite,” said Kimber Hartmann, Center for BrainHealth’s development director. “This new technology will enable us to discover so much more about the human brain, which we hope will lead to new innovations in brain science that can make a meaningful impact in the lives of those struggling with brain disease or mental illness — as well as those who are looking to cultivate and maintain brain health. We are so grateful to Robert and The Meadows Foundation for their key contributions to this work.”

CHAMPION NEW IMAGING SUITE AT THE BRAIN PERFORMANCE INSTITUTE™

OCTOBER 2015
Chancellor William H. McRaven of The University of Texas System makes a bold prediction at the groundbreaking ceremony for the Brain Performance Institute building.

“We’re going to know a lot more about how to take care of our brains. We are going to need to take care of it, because thanks in part to the physical fitness revolution, people are living longer. To make the most of the years we have, we need to make sure that brain fitness catches up with physical fitness. And I’m convinced it’s going to happen, and I am here to state in no uncertain terms that The University of Texas System intends to lead this new revolution to benefit our state, our country and the world.”

NOVEMBER 2015
Chancellor McRaven announces his vision for the UT System, his Quantum Leaps initiative, a series of nine ambitious, system-wide goals. Among them is leading the brain health revolution.

“We will make an unprecedented investment in leveraging and connecting all the cutting-edge science ongoing at UT institutions... With an ambitious collaboration between UT institutions, the UT System is committed to using its size, scope and expertise to accelerate and revolutionize our understanding of the human brain. New discoveries and treatments are within reach. Investing in neurosciences initiatives will not only advance UT’s current work and research; its impact has the potential to change the lives of millions of people across Texas and the world.”

JANUARY 2017
The Brain Health Revolution is front and center at the 2017 Chancellor’s Council Executive Committee Winter Program & Business Meeting.

Chancellor William H. McRaven brought together supporters from across the System for a two-day “Leading the Brain Health Revolution” symposium on the UT Southwestern campus. Prior to the Chancellor’s Council Executive Committee official business, attendees heard from researchers on a variety of topics, including traumatic brain injury, stroke, neurodegenerative diseases, mental health, memory and sleep as well as extending brain health. Center for BrainHealth’s Dr. Sandra Bond Chapman and Dr. Ian Robertson led the morning keynote that highlighted the latest cognitive neuroscience discoveries that relate to executive performance, stress management, innovative thinking and enhanced decision-making.

Presenters hailed from UT Arlington, UT Austin, UT Dallas, UT Health San Antonio, UT MD Anderson, UT Medical Branch Galveston, and UT Southwestern from fields including neurology, neurosurgery, bioengineering, neuropsychology, physical medicine and rehabilitation, and vascular neurology.

ROBERT MEADOWS AND THE MEADOWS FOUNDATION
Sponsored by Sewell Automotive Companies, the Think Ahead Group’s annual Kentucky Derby-themed fundraiser fell on Cinco de Mayo and featured a twist that included margaritas and mint juleps. Funds raised by the young professionals who are passionate about brain health allowed them to donate $35,000 to the Discovery Group. This Center for BrainHealth™ program works to improve quality of life after an Alzheimer’s diagnosis and raise awareness about the signs of dementia. Lindsay Gehan chaired the event with assistance from Kristen Carter and Kendal Kramer. Since its inception in 2009, The Think Ahead Group has donated more than $280,000 in support of research and programs focused on brain injury, brain disease and healthy brain function.