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CENTER FOR

VITAL LONGEVITY

NEWSLETTER OF THE CENTER FOR VITAL LONGEVITY THF

DIRECTOR'S MESSAGE Force for Good



Welcome to our Spring newsletter. This edition falls hard on the heels of our very successful Jean and Bill Booziotis Distinguished Lecture (see right) and the UT Dr. Michael Rugg Dallas Gala where Mr.

Booziotis was honored with a Gifford K. Johnson Community Leadership Award. These events are not unconnected: Mr. Booziotis has been an unstinting supporter of the University for many years, and of the CVL since its inception, serving as our adviser, advocate, and friend. We are proud and honored that he and his late wife Jean endowed the lecture in their name that helps us to fulfill our mission in public education in science. On behalf of all us at the Center, congratulations, Bill, on your highly deserved honor.

Our speaker at the Booziotis lecture — Dr. John Gabrieli — did a wonderful job in highlighting the importance and potential of the disciplines of cognitive neuroscience and neuroimaging, touching on a wide variety of topics including psychiatric disorders, education and, not least, lifespan development and aging. We strive every day to apply these disciplines to the study of the aging mind, and to developing the knowledge that will allow the greatest number of us to enjoy cognitive vitality for as much of our lives as possible. We deeply appreciate your support in helping us to achieve this goal.

Michael My Dr. Michael Rugg

3rd Annual Booziotis Lecture features MIT Neuroscientist John Gabrieli

The Center for Vital Longevity held the third annual Jean and Bill Booziotis Distinguished Lecture at the Communities Foundation of Texas on April 6, welcoming Dr. John Gabrieli, Director of the Athinoula A. Martinos Imaging Center at the McGovern Institute for Brain Research at the Massachusetts Institute of Technology, for a talk on "neuroindividuality."

In an evening lecture that was completely free to the public, thanks to the generosity of the late Mrs. Jean Booziotis and her husband, Bill, Dr. Gabrieli highlighted what principles of brain organization are consistent across individuals, and how brains vary across people due to age, personality, and other dimensions of individuality.

Nearly 300 guests attended the talk this year at the Communities Foundation of Texas, whose architecture was conceived and designed by Mr. Booziotis. Dr. Gabrieli's talk was preceded by an evening reception of the CVL Director's Research Circle.

Touching on personality types, gender and culture, and the way these differences are reflected in the activity of our brains, Dr. Gabrieli described how such factors might be better understood through imaging. Dr. Gabrieli shared current research on just how varied individuals of all ages can be in their integration of feeling and memory.

Several generations attended, including students and staff from the Hockaday School and Williams Prep.

"Dr. Gabrieli's lecture was enlightening and offered all in the audience insight into how complex and



MIT Neuroscientist Dr. John Gabrieli, speaking at the Communities Foundation of Texas.

varied people's brains are, reflecting factors such as personality type and cultural background," said CVL Director Dr. Michael Rugg. "We were delighted to bring this lecture to the community atlarge. We are very grateful to Dr. Gabrieli for visiting Dallas to share his research in such an accessible way."

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PROFILE

Path Forged in Politics Takes Turn into Memory and Preserving Cognition CVL Councilmember Ocie Kazee-McCallister

Ms. Ocie Kazee-McCallister's path to politics emerged from the world of finance — and a belief in a teenager who is now representing the promise of today's youth and older generations.

Ocie, the District Office Manager for State Representative Eric Johnson and District 100, which includes western and southern areas of Dallas and Mesquite, reflected on her career recently over lunch at a South Dallas eatery just down the block from Rep. Johnson's district office.

As Rep. Johnson's right-hand person, Ocie oversees his legislative calendar, manages his district office and connects him to a broad community of decision makers. Recently, the Center for Vital Longevity was pleased to add her to its advisory council, connecting her to something she has come to know well as caregiver for her aging mother: Alzheimer's Disease.

Diagnosed in her mid-90s, Ocie's mother displayed some of the hallmarks of dementia: forgetfulness, repeating stories despite just having told them, a decline in her personal hygiene and weight loss. It was a harsh reality, but one that Ocie has attempted to take in stride, making sure to visit her mother daily, if not several times a day, in the memory care facility where she resides.

Ocie admits that her personal connection to cognitive decline, and seeing it up-close in her mother, drew her to the latest research from the Center, and the work of Drs. Denise Park and Michael Rugg. But the neuroscientific tips and advice she has learned are something she has made a mission of among her constituents, which includes several of Dallas' most underserved school districts.

Ocie has helped make them aware of the annual CVL public lecture series (see p. 1) and has begun working with a UT Southwestern public education initiative about the brain.

As a fellow parishioner at Dallas West Church of Christ, Ocie came to know Eric Johnson prior to his aspirations of becoming a lawyer or a political leader. After Mr. Johnson received his J.D. from the University of Pennsylvania and returned home, Ocie was there to assist him in preparation for the bar exam, providing tutoring every evening, including weekends, for two months.

"I saw in Eric an exceptional young man who was succeeding against the odds," Ocie said. "He was super smart and I knew he was going places. I also knew he would be successful in whatever career path he chose. I wanted to give him the support he most needed at that time."

Rep. Johnson is quick to point out that he's eternally grateful to Ocie and that perhaps he would not have passed the bar without her.

Ocie herself is an SMU alumna. Her professional career before becoming a public servant was primarily with Southwestern Bell Telephone, Xerox Capital Services and Washington Mutual, prior to the bank being acquired by JP Morgan.

"The Center warmly welcomes Ms. Ocie Kazee-McCallister as one of our latest additions to the council," said Dr. Rugg, Director of the Center. "We greatly appreciate her deep knowledge of the local community and commitment to cognitive aging research, and look forward to benefiting from her wisdom and advice."

For her part, like her 99-year-old mother, Ocie won't stop. "This research affects us all in some way," she said. "My plan is make this a centerpiece of our work here, for old and young alike."



Ocie Kazee-McCallister

"We greatly appreciate her deep knowledge of the local community and commitment to cognitive aging research."

- Dr. Michael Rugg

Busy Schedule, Better Mind?

New Research at CVL Probes Cognitive Differences Among Busy and Non-busy People

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Busyness might seem to have a corrosive effect on cognition, especially in an era when work schedules are crammed with meetings and urgent deadlines, and social calendars can easily fill up with a dizzying array of events about town. Throw in smartphones and you have the power to be busy — whether it's catching up with friends or working on a presentation — most any time of day.

Busy people fear not, however: sitting alone for long stretches without much stimulation or social engagement — an example of "low busyness" — is what you should fear. Recent findings by Dr. Sara Festini, a CVL postdoctoral researcher, suggest that when it comes to cognitive vitality and preserving memory, the busier the better.

Dr. Festini, along with Dr. Denise Park, CVL's Director of Research, examined day-to-day busyness and whether there was a relationship with cognition.

Basing their study on the theory that increased mental engagement can sometimes increase brain efficiency due to neural plasticity in brains of older adults, the researchers hypothesized that a busy schedule would promote cognitive engagement and benefit memory.

The study, presented at the Psychonomic Society's 56th annual meeting last fall, looked at 463 individuals from the Dallas Lifespan Brain Study, a large-scale multimodal assessment of cognition, brain structure, and brain function in adults spanning ages 20 to 89. Although the results were correlational, busier people tended to have better episodic memory, processing speed, working memory, and reasoning skills.

Some of the other findings were also intriguing and highly relevant to modern day life.

For instance, people were busiest in their 30s, with decreases in busyness thereafter. The researchers believe these high levels of busyness may correspond to increased work, home, and societal demands that affect generations differently.

Women also reported being busier than men, although this gender difference was not present during some of the busiest decades for both.

Why?

"We speculated that gender differences were absent in the 30s and 40s because both genders were working at their full capacities," Dr. Festini explains.

Furthermore, high levels of busyness were significantly associated with increased levels of education, more frequent participation in novel activities and social activities, and an increased need for cognition, suggesting that busy people may seek out enriching cognitive engagement.

"This is important work," Dr. Park said. "We constantly commiserate about how busy we are, but almost no one has ever studied its effect on cognition or the brain. One might expect being too busy could result in a stress response that is damaging to cognition, but that does not appear to be the case."

Living a busy lifestyle appears to



Dr. Sara Festini

be beneficial to cognition, although additional research is needed to further examine relationships between busyness, stress, and cognition, Dr. Festini says.

For her part, Dr. Festini is leading a busy life, doing speaking engagements between research. In early February, Dr. Festini spoke at an Aging Mind Foundation event, discussing current research on dementia and normal aging.

Dr. Festini holds the CVL Aging Mind Foundation Postdoctoral Fellowship, which is funding her continued research on the impact of busyness on memory and brain function.

The poster she presented on this busyness work was a finalist for the 2015 American Psychological Association Division 3 Best Psychonomic Society Poster Award.

Researchers Probe What Allows Old Memories to Resist "Interference" During New Learning

Acquiring new memories can enrich the human experience, although new memories can interfere with old ones and make them more likely to be forgotten – especially when a new event is highly similar to a past experience.

In an April issue of the *Journal of Neuroscience*, Dr. Josh Koen and Center Director Dr. Michael Rugg addressed how some memories persist in the face of strong interference. Drs. Koen and Rugg tested whether "reactivating," or bringing to mind, old memories during the course of new learning increases or decreases the interfering effects of new learning.

Drs. Rugg and Koen found that the reactivation of features of an initial experience shared across numerous events in the same category, but not features unique to a particular event, are important in resisting the interfering effects that accompany new learning.

While undergoing functional magnetic resonance imaging (fMRI), study participants were shown some words twice in association with two different judgment tasks while other words were presented only once. Later memory tests required the participants to recall the distinct tasks that were associated with each of the study words, regardless of whether the words were presented once or twice.

Drs. Koen and Rugg found that older memories that were more strongly reactivated during new learning were *less* likely to be forgotten. In contrast to what has been previously thought, this finding suggests that reactivation of old memories during new learning mitigates the effects of interference and leaves those old memories intact.

One prevailing hypothesis has been that if a new experience reactivates an older memory, it returns that memory to a malleable state that makes it susceptible to change or outright forgetting. The researchers put this hypothesis to the test — to see whether reactivating old memories can increase their susceptibility to interference — by applying multi-voxel pattern analysis to imaging data in 19 adults who were scanned.

The findings that emerged shed light on how some memories are able to resist the potentially negative consequence



Drs. Michael Rugg and Josh Koen at this year's annual Cognitive Neuroscience Society meeting.

of new learning, said Dr. Koen, the first author on the paper. "The results from our study suggest that when aspects of an older memory are reactivated during new learning, perhaps even when we are not consciously aware that the memory was reactivated, it is less likely to suffer interference and be forgotten."



Dr. Denise Park with Bill Booziotis.

Bill Booziotis Receives Award for Dedication to CVL

CVL Advisory Councilmember Bill Booziotis' tireless support of the Center and UT Dallas have earned him a 2016 Gifford K. Johnson Community Leadership Award. The award is UT Dallas' way of thanking champions of UTD who have taken up the University's cause "with exceptional support, dedication, passion and enthusiasm for our vision of becoming a leading national research university." He and his late wife established the Jean and Bill Booziotis Opportunity Fund for the Center, which has also created the annual public neuroscience lecture series that bears their name.

"Since its founding in 2010, Bill has helped establish a key base of donors by chairing the Director's Research Circle group," said Center Director Dr. Michael Rugg. "Because of Bill's drive over the last five years, this group of committed supporters has stepped up by donating additional funds. We were proud to nominate Bill for this prestigious award."

The award was presented at a UTD gala April 21 at the Renaissance Dallas Richardson Hotel.

High School Team Constructs Robotic Wheelchair with Help from CVL

Starting with some off-the-shelf transistors, motors and gyros, several seniors at Hillcrest High School are feverishly working in robotics teacher Tige Brown's classroom long after most students, instructors, and much of the corporate world, have gone home. It's late on a Wednesday evening and they are racing to complete a wheelchair controlled by brain waves — a device that has been months in the making and was featured at the Dallas Arboretum's Earth Day celebration on April 16.

The students are part of UT Dallas' Young Women in Science and Engineering (YWISE) program, whose purpose is to provide real-world research and engineering experience to high school students, with the aim of increasing their interest in science, technology, engineering and math. Now in its fourth year, YWISE is providing mentoring and support for more than 50 high school students from eight high schools across Dallas.

Operating on a shoestring budget, the team at Hillcrest High has devised a way to propel and steer the chair through a computer program, so that the passenger can move in any direction without speaking, in the instant of a thought. While holding the headset that directs the machine, Dr. Chandramallika Basak explains how the chair works: brains emit electrical waves, and some of those waves, such as "alpha" and "beta" waves, are associated with cognition. The headset registers the waves and, through a computer program that the team has designed, classifies them and transmits signals via Bluetooth to steer the wheelchair.

Dr. Basak, the students' mentor and an assistant professor at the Center, has volunteered part of her busy schedule to mentor the group as part of the program. In addition to being an authority on the impact of the video game training on cognition, Dr. Basak is a highly experienced computer programmer.

"Science and engineering challenges require a degree of creativity and the inspiration to try unorthodox methods to solve everyday problems," Dr. Basak says. "It's immensely rewarding to see young faces light up when manipulating technology and using their own imagination to power this device, which with some further refinement has the potential to help people."

Approaching dinner time and stopping only to answer a call from her father ("I'll be home in 15 minutes, dad"), senior Juana Tovar fastens an electrical wire within a plywood box that looks more like a splayed open PC filled with motherboards. Mr. Brown looks on. People with fully functioning legs rarely think about their own locomotion, he explains. Consider the challenges of being wheelchair-bound as a result of being paraplegic; his students have had to think about this project from a different perspective, he says. "And they are tackling this challenge largely on their own, with minimal direction from me."

The success of the program and the teams' completion of their projects depend on an advisory team of mentors comprised of UT Dallas students and professors, professionals from industry, and dedicated high school science teachers, says Dr. Magaly Spector, UT Dallas professor, special assistant to the provost, and the founder of the program. This year there are 10 teachers, 12 faculty, 26 college students, and 19 industry professionals from Texas Instruments, Ericsson, and Cisco participating in the program as mentors for teams at different highs schools.

"It takes a village, as is often said, but the result is well-worthwhile: a budding crop of students who are inspired to pursue solutions and ideas in applied science and engineering to tackle the challenges of tomorrow," she says. \diamondsuit



Left: Teacher Tige Brown and students from Hillcrest High School worked together on a robotic wheelchair that can be controlled by brain waves, with CVL's Dr. Chandramallika Basak. Right: A student points to internal components housed beneath the chair.

NEW FACES

Karen Liu — Administration



Karen joined the Center in March, transferring from the Erik Jonsson School of Engineering and Computer Science, where she worked as an accountant in the Dean's office. A graduate of the China Agricultural University, Karen also earned her masters in accounting and information management from UT Dallas. As the Center's financial analyst, Karen will be reviewing CVL's accounts, strategizing for future budgets,

preparing financial reports and identifying areas to streamline. Whenever she has a free moment, she enjoys movie-going, traveling and spending time with her family and two cats.

Jerchel Anderson — Administration



Jerchel Anderson joins the Center from the Univ. of California, Los Angeles, where she oversaw budgetary and operational aspects of University Apartments Housing for graduate students. Prior to her position as a business officer at UCLA University Apartments, she served as director of finance and personnel for two large research projects: UCLA's Institute for Democracy, Education, and Access (IDEA), a research and

policy institute dedicated to understanding racial and social inequalities in education while bringing about change, and the *All Campus Consortium On Research for Diversity (UC ACCORD).* She joins the Center for Vital Longevity as Manager of Research Administration. Her undergraduate degree is from Cal State-Los Angeles and she holds an MBA from Cal State-Monterey Bay.

Tim Schuurman — Administration



Tim joined CVL in April as a Software Systems Specialist, after seven years working for Denton County Emergency 911 Dispatch, which serves 11 different police departments, and the Denton County Sheriff's Office. In this role, Tim troubleshooted and maintained the IT systems that powered a complex phone and software architecture responsible for helping first-responders save lives. His specialty is in network and

communications management, having received a degree from DeVry University prior to joining the non-profit world. Tim is a proud father and likes spending his spare time with his two young daughters.

Saad Alghamdi — Rugg Lab



Saad joined CVL recently as a graduate intern, traveling from Saudi Arabia to study cognitive neuroscience. He earned his bachelor's degree in psychology from King Abdelaziz University. After graduation, he worked as a teaching assistant for nearly two years at King Saud University. His stint at UT Dallas is the result of being awarded a study abroad scholarship to earn a master's and Ph.D. in

cognitive sciences. Saad is interested in a variety of brain functions such as memory, aging, and decision-making to understand the cognitive processes underlying behavior and mental health. He is specifically interested in the interaction of the medial temporal lobe and the prefrontal cortex, in terms of understanding the roles these brain areas play in the encoding and retrieval of memories.

Diana Lau — Park Lab



Diana joined the Center in March, arriving from the Richardson campus where she was most recently part of Financial Management Services and worked with the Associate Controller. Prior to that, she worked with the Business Manager at UTD's Naveen Jindal School of Management Executive Education program. Originally from

Hong Kong, Diana immigrated to the United States in 1996. In her role as an administrative associate to Dr. Denise Park, she is in charge of reconciling accounts and handling operational activities for Park Lab. In her spare time, she enjoys traveling, hiking, shopping and playing tennis.

Thomas Fritsch — Park Lab



Tom joined CVL in April. A native of Milwaukee, Tom was the Director of Research at the Parkinson Research Institute of Milwaukee, the research arm of the Wisconsin Parkinson Association an organization devoted to serving those with Parkinson's disease throughout Wisconsin and

five other Midwestern states. Tom also spent a decade as a researcher at the Alzheimer's Disease Research Center at Case Western Reserve University in Cleveland. Tom holds a doctorate in cognitive psychology from Miami University of Ohio. A relatively new resident to North Texas, he moved to Dallas less than a year ago when his spouse won the position of principal bassoon in the Dallas Symphony Orchestra. In his job search in Dallas, Fritsch was very excited to learn about the Center and Dr. Denise Park's role in building it, after "reading Dr. Park's books and articles for most of my career." In his new role, Tom will be working with CVL team members to study how variables such as socializing, doing mental activity, and exercising predict maintenance, decline, or improvement in cognitive function over time. \bigcirc

Diana Aguirre — Development



Diana joined the Center in March as the Director of Development. Prior to joining UT Dallas, she worked at Big Brothers Big Sisters (BBBS) Lone Star for 11 years. In her last role at BBBS, Diana served as the Vice President for Board and Community Engagement and the Regional Executive Director for Dallas and Collin Counties, providing

leadership and support to all regional boards with a specific focus on Dallas' and Collin County's boards. Prior to joining BBBS, she worked for the Dallas Independent School District as the coordinator for their Youth Mentoring program, a partnership with BBBS targeting several low-performing high schools. Diana got her start in the nonprofit world after several years in the telecom industry. A graduate of Southern Methodist University, she currently serves on its Alumni Board. In her spare time, she loves to read, run, and crochet blankets for loved ones.

AWARE Affair Supports Park Aging Mind Lab

The AWARE Affair on April 9 featured dinner, dancing and a live auction to raise money for organizations that assist people with Alzheimer's Disease or that conduct research on its causes. Benefitting the Center for Vital Longevity among others, the event was held at the Hilton Anatole, in honor of longtime *Dallas Morning News* philanthropy columnist Bob Miller, now retired. A portion of AWARE's proceeds from the evening went to Dr. Denise Park, CVL's Director of Research. The AWARE funding will support the creation of an online repository of data from her Dallas Lifespan Brain Study (DLBS), which she directs.

The DLBS tracks changes in the structure and function of the brain through imaging, while following participants over time to map how brains maintain cognitive health or, alternatively, transition to an unhealthy brain. This generous AWARE funding provides additional resources to disseminate the data, primarily costly brain scans, to other researchers interested in using the data to answer their research questions.



Establish a Legacy that Inspires Bold Thinkers and Innovative Research

At UT Dallas and the Center for Vital Longevity

Now, more than ever before, donor support is critical to the Center for Vital Longevity's and UT Dallas' continued growth and success. Join others who have discovered a gift that pays income for life and qualifies for an immediate tax deduction. It's also a meaningful way to honor family or friends by establishing a legacy in their name that will inspire the next generation of bold thinkers and innovative research at UT Dallas and the Center for Vital Longevity.

To learn more, please visit vitallongevity.utdallas.edu/support or contact Diana Aguirre, CVL's Director of Development, at 972-883-3728 or diana.aguirre@utdallas.edu.

A gift of at least \$10,000 will secure a steady income for life:		
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75	5.9%	\$4,267
80	6.8%	\$4,791
85	7.8%	\$5,501
90	9.0%	\$6,242

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THE SCIENCE OF THE AGING MIND

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