DEPARTMENT OF

PSYCHOLOGY AND NEUROSCIENCE

2015

newsletter/2015

Enhancing Early Detection of Alzheimer's Disease

Memory for a past event typically involves remembering the various components of the event (known as item memory) as well as the associations between the components (relational memory). In order to retrieve rich, detailed memories of our everyday experiences, such as a party attended last week, we must recall not only the individual experiences (i.e. the taste of the food or the sound of the music), but also the way in which all the components were bound into a single event.

Relational memory is more complex and, therefore, more sensitive than item memory to decline in several populations, including normal, successful aging populations. Dr. Kelly Giovanello, an Associate Professor in Cognitive Psychology, explains, "Successful aging is staying mentally active, physically active, and socially active. Most of the successful agers I've seen are people that, throughout their lives, independent of whatever job or position they've had, stay mentally active." Deficits in relational memory are a fundamental aspect of age-related cognitive decline. Older adults with deficits in relational memory can show impairment in perceptual, spatial, or temporal relational memory.

With a decline in perceptual relational memory, older adults are impaired in remembering the letter, voice, or font in which information was previously presented. Loss of spatial relational memory manifests when older adults are impaired in remembering the location of objects or words on a screen, building and landmarks on a tourist map, and objects in a room. When temporal relational memory is impaired, older adults experience difficulty in determining which event came first, then second, and so on.

Several studies over the past decade indicate that

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Welcome to our new entering class of 2015-16 Ph.D. students!

Embracing Neuroscience in Psychology

Effective July 2015, we became the Department of Psychology and Neuroscience at UNC. This decision was approved by vote at a faculty meeting and finalized by the Administrative Boards of the General College and the College of Arts and Sciences.

"We're excited to announce this name change, as it unifies our department by more effectively encompassing the diversity of our faculty's teaching and research initiatives," explains Dr. Donald Lysle, Department Chair. Over the past decade, the field of psychology has increasingly become more engaged in the direct study of neural processes underlying behavior. This is reflected in the increasing use of technologies, such as neural imaging in both animals and humans and the development of cutting-edge techniques, including optogenetics to activate specific populations of brain cells in animal behavioral studies and the examination of neural circuitry that is associated uniquely with risk for behavioral disorders and negative health outcomes, among others.

With such changes to the field of psychology, our faculty believe that UNC should remain at the forefront of this movement to retain our department's status as a leader within our discipline. More than half of our current faculty engage in neuroscience research and receive neuroscience-specific funding. Dr. Lysle says, "By changing our name to include neuroscience, we better reflect who we are and what we do and continue to attract the most innovative faculty and students."

Beginning Fall 2015, the Department of Psychology and Neuroscience launched a new Neuroscience Minor. "We're very excited about a new minor that accentuates our strengths as a department and reflects student interest," says Dr. Beth Kurtz-Costes, a Full Professor in Developmental Psychology and Director of Undergraduate Studies.

With a new minor and brand, the Department of Psychology and Neuroscience is able to more successfully represent our collaborative research and dedicated instruction in both disciplines, while still retaining our rich traditions of psychology. Dr. Lysle says, "I look forward to an academic year with a new name and a continued dedication to excellence in psychology and neuroscience."

Couples Therapy Improves Treatment Outcomes

Melanie Fischer, Clinical Psychology Graduate Student

Most adults who seek treatment for a psychological problem receive individual psychotherapy, typically involving multiple one-on-one sessions with a therapist. However, research suggests that it is important to figure out how romantic partners react to psychological disorders and how a relationship can contribute to, or detract from, successful treatment. Recent findings show that including a romantic partner in therapy has the potential to dramatically improve treatment outcomes – however, the mechanisms for these added benefits are not always clear.

Melanie Fischer, a graduate student in Clinical Psychology, says, "I've spent my graduate school years at UNC working to find out more." She conducted her research on couples-based treatments for a variety of psychological disorders with Dr. Donald Baucom, a Richard Lee Simpson Distinguished Professor in the Department of Psychology and Neuroscience.

Fischer focused on psychotherapy treatment research using couples to treat eating disorders and anxiety disorders, including obsessive compulsive disorders. As a therapist, she gained an in-depth understanding of the challenges these couples face and how they interact with each other. For her dissertation, Fischer measured emotional arousal through voice recordings of couples throughout a conversation to examine how the partners influence each other. Her findings indicated that individuals with these disorders rely on their partners to help regulate their emotions. Fischer says, "It's my hope that these findings will eventually help to optimize couples-based treatments."

In addition to her research, Fischer is launching a major effort in England in collaboration with Dr. Baucom, Dr. Michael Worrell, Director of the Central London Cognitive Behavioural Therapy Training Centre, and Dr. Sarah Corrie, Visiting Professor at Middlesex University. The four-person leadership team will disseminate a couples-based treatment for depression this fall, which they hope will have an important impact on the National Health Service. Fischer will train therapists in workshops throughout England and conduct research on the effectiveness of this treatment in real-life settings. The team will co-author a book with Routledge Publishing on couples therapy, including an evaluation of the treatment and their findings. Fischer will also write a similar book in German as a senior author.

Fischer first joined the Clinical Psychology Program in 2009 as a Fulbright Scholar from Calberlah, Germany. Successfully defending her dissertation, "Disorder-Specific Patterns of Emotion Coregulation in Couples: Comparing Obsessive Compulsive Disorder and Anorexia Nervosa", in Spring 2015, Fischer is currently completing her pre-doctoral internship at the Medical University of South Carolina and the Ralph H. Johnson VA Medical Center, where she is conducting research on post-traumatic stress disorder and couples-therapy for veterans. Of her time at UNC, Fischer says, "I feel extremely lucky to have spent my graduate training here. Our program provides both excellent clinical and research training, and this integration has allowed me to develop a research program that I don't think I would have been able to pursue without my clinical experiences."

Greetings from Davie Hall! I am pleased to share our year and future plans for the Department of Psychology and Neuroscience.

Our name change is just one of many exciting new developments in the department. Becoming Psychology and Neuroscience allows us to better reflect the evolving field and our place within it. I believe that this name change captures a more accurate portrayal of our research, teaching missions, and vision for our department's future. As we incorporate more state-of-the-art neuroscience and biological measures into our research and teaching in all of our programs, I am confident the strengthened focus will help us to maintain our prominent national ranking.

The quality of our programs and the strength of our research are evidenced by our continued 12th place ranking in the nation by U.S. News and World Report. We were also ranked #3 among UNC College of Arts and Science departments with grant funding over $12 million in the 2014-15 fiscal year. Roughly 70% of our faculty have federal grants and make substantial contributions to the advancement of science.

This spring, we anticipate the completion of a multi-million dollar renovation of Howell Hall. Howell Hall was built in 1906 as the Chemistry Department and later served as home for the School of Pharmacy and later the School of Journalism. Howell Hall, once finished, will be a state-of-the-art research facility for neuroscience. New core laboratories will include a confocal microscope, human neurostimulation and neural recording, physiological monitoring, brain imaging, and a space for behavioral observation.

Our undergraduates continue to engage in new opportunities in the department. The Neuroscience minor officially launched this fall and over 50 students have already enrolled in the minor. A new Neural Connections group, which you can read more about in this issue, is engaging the community (from ages 8 to over 65!) with hands-on neuroscience activities. Our Karen M. Gil Internship Program in Psychology welcomed an additional eleven psychology majors into the Fall 2015 cohort. They've been placed in internship sites all over Research Triangle Park – I look forward to the Gil Internship's weekly blog where our majors share their new research experiences.

Our collective need still exceeds the state and federal funds that are available to us. Private funding continues to play a pivotal role in helping the department capitalize on our many strengths. In this newsletter, you'll read about interesting and innovative research being conducted by our faculty and students – and how private support from alumni like you makes those projects possible.

Private giving is crucial to maintaining the academic excellence of our department for current and future students. So much of what we do depends on the generous support we receive from alumni and friends of the department and we are appreciative of any gift, large or small. If you have already made a gift to us this year, we thank you for your generous support.

I hope you enjoy hearing news from our department. When you visit Carolina, I invite you to visit us in Davie Hall.

Sincerely,

Donald T. Lysle

Donald T. Lysle. Ph.D.
Chair of the Department of Psychology and Neuroscience
Kenan Distinguished Professor

Reducing Measurement Bias In Substance Use Research

Substance use in adolescence is an epidemic that has significant physical, psychological, and social effects on adolescents and their families. Recent decades have seen tremendous strides in understanding the complex biological, behavioral, and social factors that give rise to the development of substance use disorders (SUDs) in youth. Much of this research has relied on self-report measures of substance use.

Measurement of substance use is challenging because participants, particularly adolescents, are not always truthful. Wording questions can also be complicated (i.e. "I have gotten in fights or arguments with friends and family after drinking" with response options varying from "never" to "always") as the construct is inherently subjective. Cole explains, "Using this example, maybe I fought with friends and family twice last week after drinking, but I don't feel as though my drinking was the cause of the argument; or maybe I don't consider twice last week to be particularly often, whereas someone else certainly might." Additionally, it can be problematic to measure substance use, because its very nature may affect accurate recall of events.

Veronica Cole, a graduate student in Quantitative Psychology, recognized the difficulty of assessing SUDs in adolescence and focused her research on identifying and reducing the bias in measurement. Her new research project titled, "Mixture Modeling of Patterns of Substance Use: Taking into Account Measurement Bias," was recently funded by the National Institutes of Health through a pre-doctoral fellowship.

Her project explores a form of measurement bias known as differential item functioning (DIF). Given an item intended to measure an underlying construct, DIF occurs when subjects with the same level of the underlying construct differ systematically in their responses due to their gender, race/ethnicity, age, or any other individual characteristic.

For example, in one study of problem drinking among college students, female participants were much less likely to endorse the statement, "I spent too much money on alcohol," than male participants. Cole says, "Authors hypothesized this had little to do with the female respondents' problem drinking. It was much more likely that gender norms around paying for alcohol in mixed-gender settings, explained this finding." Given enough statements like this and ignoring responses due to gender, researchers might underestimate female participants' levels of problem drinking.

Veronica Cole, graduate student in Quantitative Psychology

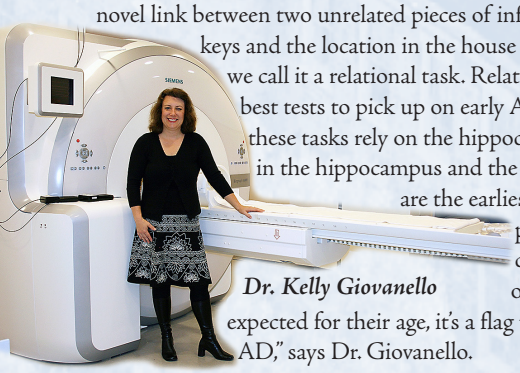
Cole's research seeks to find and solve measurement problems such as these, in order to make current behavioral measures of substance use generalizable to all adolescents. Using a simulation study, Cole will generate data that mirrors actual substance use data with DIF on the basis of a number of variables, including age and gender. After creating many samples of data with conditions presenting low to severe DIF, Cole will run a number of current tests to see how well each test does at discerning DIF.

Cole hypothesizes, "DIF will cause us to draw biased inferences about the underlying construct if we don't account for it." Without directly building DIF into models by recognizing that a question may be over or under endorsed by a particular group, researchers will overestimate or underestimate the results and be more likely to incorrectly classify participants as binge drinkers versus non-binge drinkers. Cole's research will would work to improve measurement and to understand the antecedents of substance use, particularly in adolescence when problems often begin. Cole says, "By developing methods for researchers to find and correct for DIF, I am hoping to make sure that advances in substance use research will be truly generalizable to everyone."

Enhancing Early Detection of Alzheimer's Disease

(Continued from Page One)

deficits in relational memory are some of the earliest impairments observed in Mild Cognitive Impairment (MCI-AD), a clinical diagnosis for the early symptomatic stage of Alzheimer's disease. "Any time a person has to create a novel link between two unrelated pieces of information – like pairing your keys and the location in the house where you've dropped them, we call it a relational task. Relational memory tasks are the best tests to pick up on early Alzheimer's disease, because these tasks rely on the hippocampus. Pathological changes in the hippocampus and the surrounding brain regions are the earliest sites of Alzheimer's related pathology. So if someone consistently fails those kinds of tests, beyond what would be expected for their age, it's a flag they may be entering MCI-AD," says Dr. Giovanello.



Dr. Kelly Giovanello

Dr. Giovanello's lab is currently running a study using multiple modalities of imaging at UNC's Biomedical Research Imaging Center (BRIC). Her lab is studying 40 participants from 65 – 85 years of age, including a control group of healthy adults and those presenting with MCI-AD. Utilizing the Siemens Biograph PET/MR scanner, researchers simultaneously capture brain structure and brain functional data in one scan. Participants perform relational memory tasks in the PET/MR scanner and Dr. Giovanello's team are able to use the structural magnetic resonance imaging (MRI) to look at volumes of different regions of the brain, diffusion tensor imaging to look at the connections between neurons, the positron emission tomography (PET) for metabolism data, and a functional MRI.

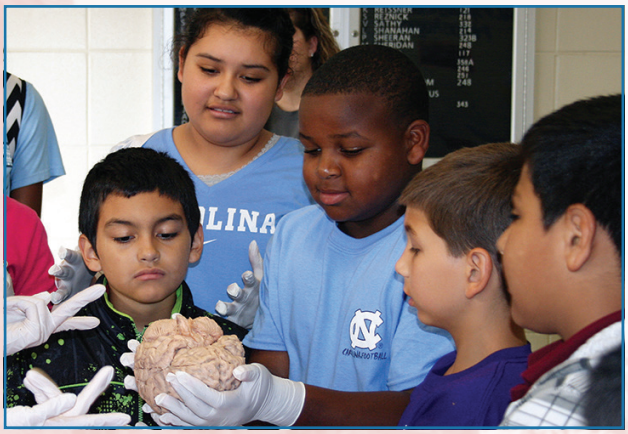
In the scanner, Dr. Giovanello explains, "we show participants pairs of words. In this particular study, individuals see two words at a time and they have to generate a sentence that includes the two unrelated words. For example, surgeon and arrow. The person has to come up with any sentence they want, such as the surgeon removed the arrow."

MRI and PET techniques show promise in diagnosing early Alzheimer's disease, but neither method alone has proven a reliable biomarker for classifying individuals with MCI from those healthy older adults without neurodegenerative disease. Dr. Giovanello proposes that by combining the PET and MR methods, scientists can enhance early MCI-AD detection. A combined approach eliminates variability across scanners and has implications for localizing brain dysfunction in early MCI-AD.

In Dr. Giovanello's project, she uses this technology to test simultaneous PET/MR in presenting MCI-AD cases amongst controls. She adds, "This project provides the essential first proof of concept necessary for future funding to test the technique in detecting silent brain disease. The opportunities for advancing our understanding of the basic neuroscience of MCI-AD using multimodal imaging are tremendous." Dr. Giovanello hopes that by pinpointing functional abnormalities occurring in MCI-AD, this data will aid in pre-clinical detection and work to advance drug discovery for Alzheimer's disease.

Engaging The Community With The Neural Connections

"Wherever I go, I try to get involved in science outreach," says Dr. Marsha Penner, Lecturer and Director of Undergraduate Research. "At UNC, there are all of these people who are interested in community engagement and diversity in the sciences. Our group naturally fell into place." The Neural Connections was formed this past spring at the Morehead Planetarium's STEMville Science Symposium, a half-day science conference for children in grades four through seven.



5th Grade Students from J. Glenn Edwards Elementary School interact with a human brain.

Dr. Penner and a group of psychology majors shared hands-on neuroscience activities with over 100 children at the event. Activities included interacting with a human brain and spinal cord and demonstrating action potential through electrodes placed on muscles, like the bicep. "We have all kinds of cool gadgets to demonstrate neuroscience – neat things that kids love. By collecting data with them and from them, it really shows the kids that anybody can be a scientist. You don't have to be a PhD, you – as a kid in grade four – can be a scientist and collect your own data."

The Neural Connections not only work with youth, but with the community at large. In September at the Museum of Life and Science in Durham, the group demonstrated the neuroscience of taste perception and helped museum-goers determine if they were supertasters. Using a test strip with phenylthiourea, adults who noticed a bitter taste were categorized as supertasters, a group with a genetic sensitivity to taste.

Based on enthusiastic feedback from undergraduates and the community, Dr. Penner applied for and received an APPLES Course Development grant to assist in building a PSYC 490 course called "The Neural Connections." Her service-learning course will be offered in Spring 2016 to provide undergraduates with the opportunity to share neuroscience with the community. By the end of the semester, students will design their own hands-on activity with an accompanying manual to explain how to implement the model. Dr. Penner anticipates sharing these activities freely online so others, such as educators, can use these STEM-resources in the classroom.

"Students who volunteer for the Neural Connections love sharing neuroscience. It's a great way to solidify what they've already learned in the classroom and to interact with faculty and students outside the classroom. We're having a fun time and being great ambassadors for the university," says Dr. Penner. Undergraduates in the Neural Connections unanimously agree. Elisabeth Ulrich, a senior graduating in May 2016, says, "I'm not crazy about a career in research. Being a part of the Neural Connections is an exciting opportunity to see how I can use psychology and neuroscience in the future in a non-research way."

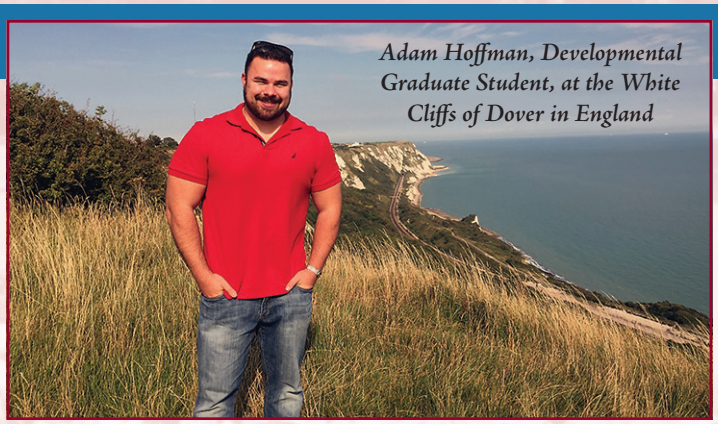
Ethnic and Gender Identity Development in French Adolescents

With the persistent underrepresentation of ethnic minorities and women in the STEM domain of science, technology, engineering, and mathematics, psychologists have begun to examine how various social psychological phenomena contribute to racial, ethnic, and gender achievement gaps. Racial, ethnic, and gender identities are believed to play significant roles in shaping adolescent academic motivation and achievement.

In Fall 2015, Adam Hoffman, a graduate student in Developmental Psychology, traveled to Aix-Marseille University in Marseille, France to work with Dr. Isabelle Régner and her Cognitive Psychology Laboratory. Dr. Régner, a senior lecturer, studies the role of social comparison, self-fulfillment of goals, stereotypes, and the cultural and gender identity of the students and their commitment versus disengagement in the academic arena.

The aim of Hoffman and Dr. Régner's collaboration was to extend the current developmental identity theory by examining the longitudinal trajectories of the development of identity-related beliefs and the impact of those beliefs on academic motivation and achievement in adolescents. Examining both ethnic majority (European French) and ethnic minority (North African French) adolescents is vital to the study as youth of North African descent are stigmatized and often perceived as lacking motivation or the ability to excel academically.

The study utilized questionnaires over a four-year period through in French middle schools, grades 6 – 9. Hoffman is currently running analyses and will examine how changes in ethnic and gender identity in these grades are related and may predict academic achievement, self-efficacy, goal orientations, and interest.



Adam Hoffman, Developmental Graduate Student, at the White Cliffs of Dover in England

Hoffman, a National Science Foundation Graduate Research Fellow, spent the fall semester abroad as a result of the Graduate Research Opportunities Worldwide (GROW) program. GROW provides opportunities for graduate students to enhance professional development through research collaborations at elite science and engineering sites overseas. Hoffman says, "As we live in an increasingly globalized society, it is critical for psychologists to understand the phenomena they study beyond the context of their local region or country."

Hoffman's research collaboration through GROW was an important part of his UNC graduate school experience. He says, "Through studying identity development in youth outside the U.S., I hope to develop a better understanding of both the universal and unique patterns of identity development in North African French youth and how these patterns compare to American youth." When Hoffman returns to the States, he will resume his work in Dr. Beth Kurtz-Costes' laboratory and begin work on his dissertation to study the development of ethnic identity and stereotypes in American Indian youth in western North Carolina.

Undergraduate Researches Behavioral Economics in Singapore

Saima Akbar, an undergraduate majoring in Psychology, was selected as a 2015 Phillips Ambassador. The Phillips Ambassadors Program is a scholarship opportunity for undergraduates to study abroad while at Carolina. The scholarship combines a financial award, an academic course, and a charge to those chosen as Phillips Ambassadors to share their study abroad experience with the Carolina Community. "It was a unique opportunity to engage another culture and conduct research in a different country," says Akbar.

Traveling to Singapore in the summer of 2015, Akbar completed her research project at the National University of Singapore. Akbar is interested in Singapore's unique balance of harmony versus free speech and how this balance impacts society. She found that Singapore maintains harmony by limiting some of the freedoms that Americans take for granted, but that the country is still able to maintain one of the lowest crime rates in the world.

Akbar also worked closely with Rongjun Yu, Ph.D., an Assistant Professor of Psychology at the National University of Singapore. Dr. Yu uses behavioral paradigms and neuroimaging methods to study why people fall prey to decision biases. Akbar, with Dr. Yu, examined emotional motives for non-cooperation when people play economic games. Participants in the study played games involving tokens that they could win or lose. Half of the participants were told they could earn extra compensation depending on their performance on the tasks. Dr. Yu and Akbar tested how greed could change the pattern of non-cooperation and early preliminaries found that participants primed with greed would invest more tokens than neutral players. They also are working on an experiment to explore the motivation of fear in economic games.

Saima Akbar, Class of 2016, at the Kuala Lumpur Bird Park in Malaysia

Research is still on-going, but even in a brief amount of time, Akbar says, "I was able to learn a lot about another culture and how research is done in another country." Akbar plans on participating in more psychological research with Dr. Yu, even now that she is back home in Carolina. While unable to work directly with participants, she will continue to analyze data and complete a research paper. She also is planning a project to "give back" to engage the Chapel Hill community to learn more about Singapore, free speech, and religious freedom. Her time as a Phillips Ambassador was a vital experience as a Carolina undergraduate. More, now than ever, Akbar says, she's aware of the importance of international research. "The quest for knowledge and for peace is an international effort, which we can learn from and improve."

Why I Give

Ann Rankin Cowan, Class of 1975

When Ann Rankin Cowan says she's "true blue," she means it. Her father, Edward L. Rankin, Jr., graduated from UNC Chapel Hill in 1940 and instilled a love of Carolina in his children. For Cowan, there was no other choice of university – she majored in Psychology and graduated with her B.A. in 1975.

Carolina has always meant family to Cowan. While she was in attendance at UNC, she had a brother in his first-year of college and a sister at the School of Law. From 1940 to 2013, 16 family members have attended and graduated from Carolina. Cowan says, "When I felt that I had the ability to give back, I wanted to give back to a field of study that provided me with intellectual stimulation."

Cowan's gift to the Department of Psychology and Neuroscience has created the Ann Rankin Cowan Lecture Series. Of her time at UNC, Cowan said, "there were few stimulating outside-the-classroom opportunities available to students. The lecture series is a great opportunity for students to hear from experts from other states and universities." The 1st Annual Ann Rankin Cowan Lecture, held in September 2015, featured Barbara Olasov Rothbaum, Ph.D., ABPP. Dr. Rothbaum received her B.A. in Psychology from UNC Chapel Hill and is now a clinical psychologist at Emory University

Ann Rankin Cowan with her daughter, the latest Cowan family UNC graduate, Jane Cowan (Class of 2012)

School of Medicine who specializes in research on the treatment of individuals with anxiety disorders. Her lecture, "Treatment of Post-Traumatic Stress Disorder: From Pharmacotherapy to Virtual Reality," enabled undergraduates, graduate students, and colleagues to learn more about her pioneering application of virtual reality exposure therapy to treat psychological disorders.

Cowan made her gift to the department to enrich and enhance opportunities in psychology that cannot be financed through tuition or state support. She worked closely with the Development Office on-campus and found that they were "so supportive of seeking out where I want to give." The Cowan Lecture Series is an exciting new venture for both Cowan and the department. Cowan believes strongly that it is the responsibility of alumni to provide meaningful Carolina experiences to its students. She states, "Now is the time for alumni to step up and give back to support the programs near and dear to our hearts."

Searching for Preventive Treatments in PTSD

Dr. Donald Lysle, a Professor in Behavioral Neuroscience

Post-Traumatic Stress Disorder (PTSD) is a common psychiatric disorder that results from exposure to a physical or psychological threat, such as military combat, natural disasters, serious accidents, or physical or sexual assault. It is characterized by chronic anxiety and exaggerated fear learning and symptoms can include re-experiencing the traumatic event, avoidance, and hyperarousal. Currently, there are no effective pharmacological treatments for PTSD and many prescribed drugs only alleviate the symptoms.

Recent clinical studies have found that morphine treatment in the hours after a combat injury can significantly reduce PTSD rates among combat veterans. Similar correlations have been found in children after an incidental trauma resulting in an emergency visit. Dr. Donald Lysle, a Professor in Behavioral Neuroscience, explains, "These findings were an a-ha moment. My dissertation research investigated fear learning in animals and, throughout most of my career, I have been studying the effects of morphine on health. I realized these studies encompassed the full circle of my career."

In 2013, Dr. Lysle established the first animal research that supports the use of morphine as a preventative treatment for PTSD. Animals experience a condition similar to human PTSD called stress-enhanced fear learning. Dr. Lysle administered non-sedative doses of morphine to several treatment groups of rats experiencing stress-enhanced fear learning. One treatment group received a dose immediately following a traumatic event, the second received a dose 48 hours following a traumatic event, and the third received multiple doses at 0 hours, 24 hours, and 48 hours following the event. His research team found that morphine was 100% effective in preventing the development of fear-learning for rodents that received a dose 48 hours after trauma. "Often in science, you find effects that are small such as a 10% change. When you see a 100% reduction and the effect is completely eliminated, it's really amazing," says Dr. Lysle.

This experiment was critical to establish that morphine can block the development of stress-enhanced fear learning and that, in order to prevent PTSD, it is important to administer a treatment in the first 24 to 48 hours. "We believe the brain is undergoing significant changes in its neuroplasticity following trauma. It's like the brain is being re-wired to become hypersensitive and hypervigilant," explains Dr. Lysle. "Of course, morphine has a high drug abuse liability. You don't want to dispense morphine as a pharmaceutical treatment. We're trying to determine what actions morphine has in the brain so we can identify a drug that more directly treats the disorder."

Researchers have found that interleukin-1 beta (IL-1), a cytokine, has effects on memory. Cells in the brain produce IL-1 as an inflammatory response to stress. "Our data shows that morphine's effects may be related to alteration of IL-1," says Dr. Lysle. "Morphine reduces IL-1 and blocking the IL-1 in rodents also prevents the development of stress-enhanced learning." Dr. Lysle's laboratory is using a new technology invented by Dr. Bryan Roth, a Professor in the Department of Pharmacology at UNC, known as Designer Receptors Exclusively Activated by Designer Drugs (DREADD). DREADD creates receptors on the surface of cells. When these receptors are activated by dru gs (designed specifically for activation), scientists can turn on or off specific signaling pathways in brain cells.

Dr. Lysle is working on a preliminary study featuring this DREADD technology. Adapting Dr. Roth's technology, Dr. Lysle is attempting to identify the cell type within the brain that is responsible for IL-1 production that is related to stress-enhanced fear learning. Dr. Lysle is currently in pursuit of the funding needed to pursue this line of research. "This research promises to provide a new treatment for PTSD. If we could find a translatable treatment for PTSD, it would be extraordinary."

CONGRATULATIONS TO OUR PH.D. GRADUATES!

Student	Program	Faculty Advisor	Year
Shianna Dye Chavis	Clinical	Deborah Jones	2014
Olivenne Skinner	Developmental	Beth Kurtz-Costes	2014
Jazmin Brown	Social	Keith Payne	2015
Erin Cooley	Social	Keith Payne	2015
Danielle Dean	Quantitative	Daniel Bauer	2015
Laura Fabricant	Clinical	Jonathan Abramowitz	2015
Ashly Gaskin	Clinical	Enrique Neblett	2015
Renske Hoedemaker	Cognitive	Peter Gordon	2015
Shane Hutton	Quantitative	Abigail Panter	2015
Yang Liu	Quantitative	David Thissen	2015
Kristjen Lundberg	Social	Keith Payne	2015
Adrienne Pettiford	Developmental	Martha Cox	2015
Elise Rosa	Cognitive	Jennifer Arnold	2015
Maura Sabatos-Devito	Developmental	Steven Reznick	2015
Jennifer Green Stevenson	Behavioral Neuroscience	Regina Carelli	2015

Psychology & Neuroscience

YOUR SUPPORT IS ESSENTIAL!

The Department of Psychology and Neuroscience gratefully thanks the generous donors who have supported its students, faculty, and programs over the years. Our success is largely dependent upon these donations and your continued support is needed.

Gifts to the Psychology and Neuroscience Department's Annual Fund are used at the discretion of the Chair and are directed to where the need is greatest. Please consider making a donation today to help us:

- Update our equipment and research space in Davie Hall so that we can provide our undergraduates with the best education possible and maintain our cutting-edge research programs
- Continue to recruit the best faculty and students to the department
- Provide graduate student funding for travel and research
- Retain our top-notch faculty

If you have questions about giving to Psychology and Neuroscience or would like additional information, please contact:

Kiley Moorefield, Associate Director of Development
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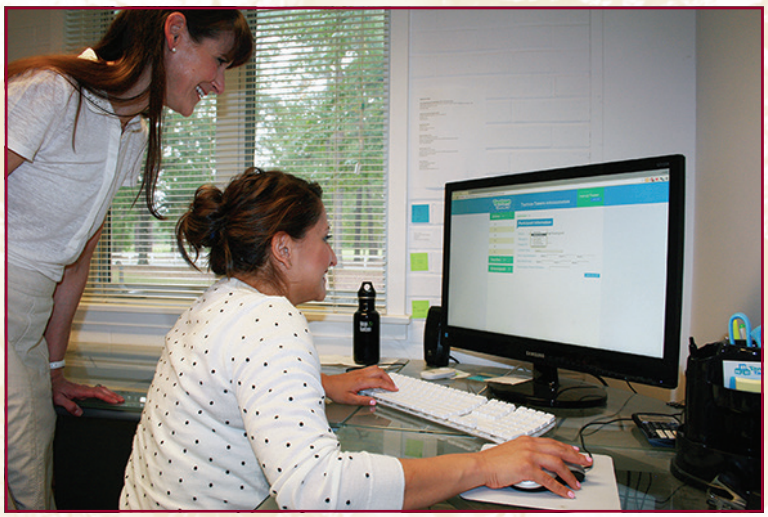
Smartphones as a Delivery Vehicle for Treatment

Early onset behavior disorders, such as attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), and conduct disorder, are overrepresented in families with chronic and acute stressors including low-income families, yet these families are less likely to engage in treatment than other populations due to lack of time or resources. This lack of care is an economic and public health issue as early onset disruptive behaviors predict delinquency in adolescence, anti-social behavior in adulthood, and in turn, up to a ten-fold increase in medical, criminal justice, and educational costs for individuals, families, and society.



Dr. Deborah Jones and 5th-year graduate student, Michelle Gonzalez, demonstrate the Tantrums Tamer App

Successful early intervention treatment for disruptive behaviors is available in the field of Behavioral Parenting Training (BPT). BPT is an effective treatment for reducing these behavior problems and, in turn, can have lasting effects for decreasing disturbances in behavior through adolescence and adulthood. Sessions in BPT are conducted with the parent(s), child, and therapist. Parents learn skills such as positive attention, ignoring, and effective consequences for problem behavior, such as time-out, as well as how to anticipate situations where a child may act out and help parents respond accordingly.

"We know that if low-income families finish Behavioral Parenting Training, they benefit just as much as anyone else," says Dr. Deborah Jones, a Professor in Clinical Psychology. However, financial strain and associated difficulties, such as shift work, problems with transportation, or poor mental/physical health, decrease the probability that low-income families will engage and complete the treatment, which includes sessions with a therapist, midweek telephone check-ins, and daily home practice.

Dr. Jones and her team worked with CrossComm, Inc., a mobile and application development company, to build *Tantrum Tamers*, a smartphone app for families and therapists to use together to curb destructive behaviors and to engage families more fully in the BPT process. "The idea behind the app is to try to increase the probability that if we support low-income families enough and connect with them enough between sessions, they're more likely to come back every week, they're more likely to understand why we're teaching them these methods, and why it's important," explains Dr. Jones.

Building upon a successful pilot study, Dr. Jones and her research team are currently conducting a research trial that is funded through the National Institute of Mental Health at our Family and Community Clinic. The study targets low-income families of 3 – 7 year olds in the community. Half of the families involved in the study receive only the standard Behavioral Parenting Training. These families work with a therapist for approximately 8 to 12 weeks in hour-long sessions. The experimental group receives the BPT sessions and an iPhone with the *Tantrum Tamers* app.

Tantrum Tamers connects the parents and the therapist through several features, including a video series, survey, and video call. Each week, families can watch a video that demonstrates what they've just learned in session. The video recaps the skills practiced in therapy and is also a helpful tool to show other adults, like daycare providers, how to work effectively with their child. Parents can also complete daily surveys which are uploaded immediately to the therapist.

One of the features, a video call, has been extremely effective for the therapist and the family. "If you're trying a skill at home, and it's not working the same way it worked in session, a parent can share that to get a quicker fix – rather than waiting a whole week later," says Dr. Jones. "It also connects the family with the therapist in an interactive way. We have very strict parameters about what time-out looks like; there must be a grown-up chair and a reserved corner where there's no one else. One of our parents walked us around her house on the video call so the therapist could help her pick the best time-out spot."

Tantrum Tamers App

Dr. Jones is still in process of recruiting and working with the 102 families for this 4-year study. She anticipates that upon completion of the treatment, children in both the control and trial groups should improve behaviorally, since the BPT is already a proven tool in this field. "Our hypothesis is that families in the technology-enhanced group will be more likely to come every week, be more likely to do their homework, and to complete the entire treatment series," says Dr. Jones.

If *Tantrum Tamers* proves to be a successful tool, Dr. Jones hopes that the app may be used as a complement to treatment by therapists who work with families experiencing disruptive behaviors. Graduate student, Michelle Gonzalez, has been working on the study as a supervised therapist. She's already found it to be a benefit. Gonzalez explains, "We're working with families that are hard to engage. This technology helps them feel more connected to their therapists and has big implications to benefit a vulnerable population."

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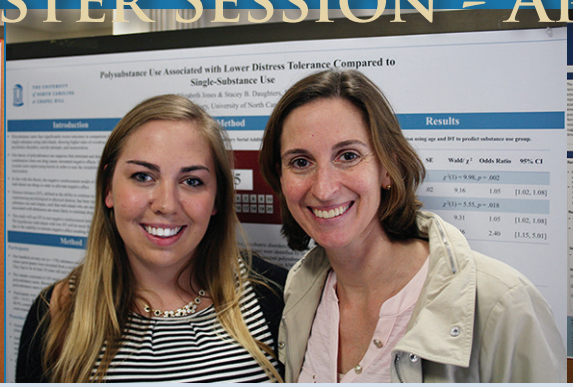
Honors Poster Session - April 29, 2015

Dr. Jonathan Abramowitz and undergraduate Robert Graziano: Graziano's honors thesis was titled, "Tipping the Scales: Improving Utilization of Mental Health Care in Military Veterans."



Dr. Stacey Daughters and undergraduate Elizabeth Jones: Jones' honors thesis was titled, "Polysubstance Use Associated with Lower Distress Tolerance Compared to Single-Substance Use."

Dr. Beth Kurtz-Costes and undergraduate Alexis Duckett: Duckett's honors thesis, "Parental Racial Socialization and Adolescents' Self-Esteem: Influences on Academic Achievement," won this year's Undergraduate Prize for Outstanding Psychology Research that Enhances Diversity.

Undergraduate Honors Program 2014-2015

Our 2014-15 undergraduate honors students are pictured above with faculty program advisors, Dr. Beth Kurtz-Costes and Dr. Peter Ornstein.