



Psychology & Neuroscience News



A New Initiative in Affective Science



CASL's first annual Emotion Research Day was held in April 2015 at the University of Denver and was a joint venture between CU and DU.

What makes the study of emotions so compelling? Assistant Professor June Gruber, a faculty member of our department, hints at the appeal of a riveting mystery story. "Broadly, this is about shedding a light on the mysteries of human nature. Emotions are an essential part of what makes us human. But surprisingly, there are still a lot of mysteries as to exactly what emotions are and how we can harness them to lead healthier and happier lives."

These ideas have prompted a new initiative that strives for an interdisciplinary approach to understanding emotion, called Colorado Affective Sciences Laboratories (CASL, pronounced "castle"). In addition to drawing attention from departments outside of psychology, it has piqued the interest of multiple areas across our department, and the backgrounds of its co-founders re-

flect this: Professor Gruber is a member of the department's clinical and social areas, Professor Leaf Van Boven is in the social area, and Professor Tor Wager is in the cognitive area.

CASL's founders feel strongly about the importance of interdisciplinary work in this field, not only across areas of psychology, but across different disciplines. "At the cutting edge of this science are attempts to measure emotion across multiple levels, meaning integrating information from the cellular level all the way up to people's self-reports about their own well-being," Professor Gruber says. "Bringing together interdisciplinary teams is essential to the success of this multi-level work. You need teams of people with specializations in a variety of disciplines like neuroimaging, mental health, language analysis, and behavioral observation, working as a team, not just as individuals."

CASL reaches out to foster academic dialogue and collaboration among these and other disciplines, including the various areas in our department, and even involving academic communities throughout Colorado. The robust group of CASL's 60 members (and growing) gives a sense of this range: though composed primarily of psychology students and faculty, fields such as philosophy, art, business and marketing, environmental studies, and integrative physiology are also represented. "It seems like this was a critical gap across the university that needed to be filled," Professor Gruber says.

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Message from the Chair

In my remarks at our Winter 2015 graduation, I mentioned that “it is *never* too early to start making contributions.” That sentiment, shared by Dr. Tina Pittman Wagers, runs throughout this newsletter. One example is that of Colonel and Professor Carl Castro (see the article on page 6), who earned his PhD from CU-Boulder with Professor Jerry Rudy. His work as a graduate student foreshadowed the significant contributions Colonel Castro would make throughout his career to both military mental health and military science. The article on undergraduate research in this issue (see page 5) echoes this sentiment: Michaela Palumbo is already making contributions through her work as a research assistant to Professor Ryan Bachtell. Perhaps most poignant, however, is when these early contributions are tragically cut short and not allowed to come to full bloom. This was the case with our graduate student Sean Hudson. In his In Memoriam on page 7, Sean’s graduate advisor Josh Correll so eloquently states that



even during his all too brief time with us, Sean was a very positive influence within his graduate student family, the social program and our department as a whole, as well as with the undergraduates whom he taught. This newsletter captures and supports the notion that each of us can contribute to making a difference by shining our light. That light not only illuminates who we are, but also is sufficiently bright to lead the way for others. The light that shines *in* us and *from* us—this is the power we hold.

On a final note... This will be my last Message from the Chair in our newsletter since I am transitioning to a new position as the Associate Dean for Research in the College of Arts and Sciences at CU-Boulder. Know that it has been my pleasure to make contributions to the Department of Psychology and Neuroscience as Chair for the past three years.

—Theresa D. Hernández

Getting to Know the Sutherland Center

The Sutherland Center was established to assist those with bipolar disorder who do not have the financial means to receive help and treatment. Located on the CU-Boulder campus, the Center is in the Raimy Clinic in the Muenzinger Building. The Center was initially given a grant from family and friends of the late Robert Sutherland Sr., a prominent businessman and philanthropist who also suffered from bipolar disorder and received treatment for his illness so he could manage his life successfully. The Center’s mission is to help those impacted by bipolar disorder with diagnosis, treatment, comprehensive collaborative care and education.

The Center's director, Dr. David Miklowitz (currently at UCLA), is an internationally-renowned researcher, clinician and author whose work focuses on family environmental factors and family treatments for adult-onset and childhood-onset bipolar disorder. Dr. Alisha Brosse, associate director, handles the Center’s daily activities, trains graduate students, leads therapy groups and teaches a seminar series on bipolar disorder for the general public. There are currently three graduate students also on staff. To donate or volunteer, contact Rachel Cruz at 720-635-6563, or for online donations, go to <http://rdsfoundation.org/support/types-of-donations>. For assistance with diagnosis, treatment, referrals, etc., call 303-492-5680 or see <http://rdsfoundation.org> —Amanda Misiak



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CASL: A New Initiative in Affective Science (continued from page 1)

Affective science is known most basically as the study of human emotion, but those in various areas of psychology approach that study from different, though often overlapping, perspectives. Clinical psychologists approach affective science with an eye on mental health and psychopathology; affective disorders, emotion regulation and more recently, positive emotion, may be emphasized. Social psychologists focus on how social experience affects emotion, and on the social function of emotions; there may be an interest in topics such as stereotyping and prejudice as well as cultural or gender differences in emotion. Cognitive psychologists are concerned with how emotion impacts cognition and vice versa; the interplay of affect and cognitive processes such as memory, decision-making, attention and cognitive reappraisal are often examined. Researchers in each of these areas also use findings from neuroimaging and the neurosciences to better understand the relationship between the brain and affective states.

At CU-Boulder, students in all areas of psychology who are interested in CASL and the field of affective science can choose from several psychology classes already in place: Human Emotion, a large undergraduate class attracting over 200 students, taught by Professor Gruber, and three graduate-level classes (Affective Science, taught by Professor Gruber; Emotion and Decision Making, taught by Professor Van Boven; and Affective Neuroscience, taught by Professor Wager). An additional elective “Brown Bag” class, held over the lunch hour, includes weekly speakers in affective science from major universities such as Yale and Stanford as well as international leaders in the field, and reading groups that expose students to cutting-edge research on human emotion. CU students can also participate in Emotion Research Day, an annual cross-campus conference with CU and the University of Denver that includes students and faculty from a variety of fields.

Some broader academic plans are also in the works. The co-founders of CASL are currently developing a formal graduate certificate program in affective science and intend to submit a proposal to the university this year. This will provide students with specialized training



Assistant Professor June Gruber, one of CASL's founders, giving a TEDx talk on "The Dark Side of Happiness" at TEDxCambridge.

to promote their future careers in the field. As part of that program, the CASL team is working on a formal curriculum of the study of human emotions, developing more in-depth courses on both undergraduate and graduate levels. One of the anticipated courses, Happiness, Psychology and Philosophy, will be taught with two philosophy professors, in alignment with CASL's emphasis on an interdisciplinary approach. Professor Gruber is also working on identifying grant and fellowship funding opportunities for students and their research projects.

The student response to CASL has been strong and positive. Graduate students in our department who identify affective science as their particular area of interest are thrilled to have this initiative in their own backyard. Maggie Tobias, a first-year graduate student in Professor Gruber's lab, plans to do her own research on the interaction between cognition and emotion, focusing on cognitive bias in relation to positive emotion and psychopathology. From her perspective, having access to faculty, research and study groups specifically about affective science is a dream come true. "CASL has been a fantastic experience," she says. "When friends ask me about grad school, I tell them that I finally get to study what I care about. I get to talk to a diverse group of really smart people about a topic I'm really interested in. At the CASL Brown Bag, we have really deep discussions with people from different areas and even different departments. There are a lot of insights and new perspectives to be gained from that."

Professor Gruber notes that the growing interest in affective science can be seen in the current increased media attention to the subject, including that of well-respected academic journals. The National Institute of Mental Health has also endorsed affective science as an important priority in the study of mental illness. "This underscores how important affective science is," says Professor Gruber. "The time for CASL is ripe. We believe CU can be at the center of major discoveries in this field, and tackle some of the biggest unanswered questions about emotion."—*Alicia Segal*

For updates and further information about CASL, go to <https://www.facebook.com/emotioncasl>

Research News

Understanding Thoughts and Feelings Using Brain Imaging

by Professor Marie Banich



You've probably all seen pictures in magazines of brightly-colored brains, showing patterns of activation associated with different mental or emotional states—insights into the human brain at work. Our laboratory leverages these techniques to understand how we control and guide our behavior, how such abilities develop during adolescence and early adulthood, and how these may go awry in individuals with psychological difficulties or challenges. I run the neuroimaging center on the Boulder campus, which provides CU researchers with ability to examine both brain structure and function at some of the highest detail currently available. For example, our recent research has shown that how well a young adult can guide his or her behavior—such as ignoring irrelevant information to remain on task, switching between tasks, and updating critical information as task demands change—is associated with specific patterns of brain structure and also brain function. Our laboratory is now using that knowledge to create a framework from which to understand how such abilities develop during adolescence.

For example, our laboratory in collaboration with our colleagues in the Institute for Behavioral Genetics has been selected to collect a subset of data for a new nation-wide study—the Adolescent Brain Cognitive Development Study (<http://addictionresearch.nih.gov/adolescent-brain-cognitive-development-study>)—that will collect brain imaging data on over 10,000 adolescents from about fifteen locales across the country. Data will be collected initially when children are aged nine to ten and they will be followed yearly for ten years. This study will not only examine brain development during adolescence but also examine how it may be affected by substance use. Our portion of the project focuses specifically on following pairs of twins to determine the relative influence of genes versus the environment on brain development and to examine how both genes and the environment may influence the impact of substance use on the brain. Another somewhat related project just beginning in our laboratory has implications for mental health. Recent research shows that the brain is undergoing rapid and multiple changes during adolescence. Adolescence is also the time during life in which mood disorders, such as depression and anxiety, tend to first manifest. Our project will examine not only the development during adolescence of brain regions important for guiding behavior, but also the development of those involved in processing emotion. We hope that the outcome of this study will enable us to determine whether changes in specific brain regions can predict the onset of the mood disorders or whether the onset of the mood disorders then leads to changes in particular brain systems.

Understanding the Nonconscious Roots of Social Behavior

by Assistant Professor Chris Loersch

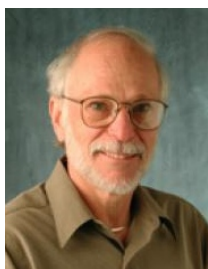
One of the oldest sayings among students of human behavior is that there is nothing so instructive as an error. It is at these times, during which behavior diverges from conscious intention, that the operation of underlying processes is revealed. If one pays careful attention to these moments, such errors can provide windows into the operation of psychological processes of which we are not aware. These events happen every day to everyone, ranging in import from simple and common errors such as driving to a location that you did not intend, to rare and horrible mistakes like accidentally killing a young black male because you thought he held a gun instead of a wallet.

My lab's research is centered upon understanding these nonconscious processes and their contribution to social behavior. One line of work examines the basic cognitive processes by which such effects emerge. In answering this question, we have developed a novel model that describes how the information made accessible by one event (e.g., exposure to a stereotypically hostile social group) can change our judgment and behavior in subsequent, completely unrelated situations (e.g., making us perceive a friend as particularly prone to anger, or administer greater punishment to an interaction partner).

In a second line of research, we seek to understand how various nonconscious processes serve our species' intense social needs. We have, for example, provided evidence that the emotional response people experience when they hear music serves an implicit social function. This is one of the first rigorous empirical investigations of the evolved function of music and suggests that human musicality helped groups coordinate social behavior. Applied work in this line examines how these social processes affect underage students' responses to alcohol advertising, again with a focus on the operation of processes that affect behavior (here illegal alcohol consumption) outside of conscious awareness.



Faculty News



Distinguished Professor Steven Maier received the prestigious 2016 University of Louisville Grawemeyer Award in Psychology. He joins past award winners who include James McGaugh, Antonio Damasio, Irving Gottesman, Leslie Ungerleider and Mortimer Mishkin, Walter Mischel, Ronald Melzack, Anne Treisman,

Albert Bandura, John O'Keefe and Lynn Nadel, Elizabeth Loftus, Aaron Beck, Daniel Kahneman and Amos Tversky, James McClelland and David Rumelhart, Michael Posner and Morris Raichle. The Grawemeyer Awards website notes: "The Grawemeyer Award in Psychology is given for original and creative ideas: ideas that possess clarity, power and that substantially impact the field of psychology....The purpose of this annual award is to acknowledge and disseminate outstanding ideas in all areas of psychological science. The award is designed to recognize a specific idea, rather than a lifetime of accomplishment....His award-winning work concerns what makes one resistant or vulnerable to stress when bad things happen. Maier showed if test subjects had behavioral control over some element of the adverse event, they were less negatively impacted and also essentially 'immunized' against some harmful effects of future bad events, even if those events were uncontrollable. Through laboratory research studies, he uncovered in animal subjects the neural mechanism that provides such resilience in the face of trauma." For more information, see <http://tinyurl.com/maieraward>.

New Faculty

In March 2016, **Zoe Donaldson** will begin her joint position as Assistant Professor in our department's neuroscience area and in the Department of Molecular, Cellular, and Developmental Biology. She will start as visiting faculty and be full-time as of Fall 2016. She received her PhD in Neuroscience from Emory University in 2009 and has held a post-doctoral appointment at Columbia University. Her research focuses on the social and biological risk factors for depression.



Dajiang Liu accepted the position of Assistant Professor of Psychology and Neuroscience in CU's Institute for Behavioral Genetics, starting in Summer 2016. He received his PhD in Statistics from Rice University in 2011 and his postdoctoral training at the University of Michigan. He is currently Assistant Professor at Penn State University's College of Medicine. His research focuses on understanding the genetic basis of nicotine addiction; unveiling the functional biology of X chromosomes; and developing novel statistical methods for data integration.



Undergraduate Research: Michaela Palumbo

Neuroscience major Michaela Palumbo has conducted research in Assistant Professor Ryan Bachtell's lab for two years. Originally from Colorado, she came to CU-Boulder specifically for the then new neuroscience degree. Michaela's thesis project, titled "Effects of Adolescent Caffeine Consumption on Addictive Behaviors in Adulthood," was one she took ownership of early on. "As we began to brainstorm ideas about what her honors thesis would entail, she expressed interest in truly taking on her own project from start to finish," said Professor Bachtell.

Initial findings from Michaela's studies suggest that adolescent caffeine consumption in rats enhances the rewarding effects of cocaine in adulthood. When rats consumed caffeine during adolescence and then began self-administering cocaine as adults, the early caffeine



consumption impacted how motivating the rats found cocaine to be. Specifically, the rats that consumed caffeine early on showed a higher motivation for cocaine self-administration.

When asked what she most enjoyed about her project, Michaela said, "We were able to tackle the entire research experience from beginning to end, from what you wanted to study and how, from designing the study to writing the final paper." Michaela, who is graduating with summa cum laude honors, is planning to apply to graduate programs in public health and biostatistics, focusing on medical research. "The environment here allowed me to learn so much, from the faculty and grad students to the other undergraduates. Everyone was helpful and supportive." —Amanda Misiak

Alumni Spotlight: Carl Castro, PhD, Colonel, U.S. Army (Retired)

Carl Castro (PhD, class of '89) has been crossing borders for most of his career. Moving back and forth between the worlds of academia, science, and the military, he has been anchored by his ongoing research endeavors and his abiding desire to make a difference in soldiers' lives.

Dr. Castro was recently appointed Director of the Center for Innovation and Research on Veterans and Military Families at the University of Southern California's School of Social Work where he's been an assistant professor for several years. Now recognized internationally as one of the foremost experts in the area of military mental health, he began his career path years ago as a young soldier and student.

In 1981, Dr. Castro enlisted as an infantryman in the Kansas National Guard and was concurrently a student at Wichita State University. "At that time, I saw the military as a great opportunity to serve my country and get a good education in the process," he says. In 1983, he became a second lieutenant platoon leader and two years later graduated with highest honors from Wichita State. He then decided to take an educational delay from the military, planning to return to active duty when he finished graduate school. The intention to return to military service came naturally to him. "I was a really good fit in the military because I was very adaptable. If you're adaptable and flexible in the military, you're going to do very well. And I always enjoyed it. The more time I spent in the military, the more I found it an increasingly interesting job."

Dr. Castro went on to CU-Boulder for his PhD in psychology, spending a year at Harvard with a fellowship in cognitive neuroscience. Throughout his training, he steadily honed the skills he would use during the rest of his professional life as a military scientist.

He particularly remembers being shaped by his training at CU, noting that it vigorously encouraged critical thinking and helped him learn how to approach and solve problems rationally. "I was also very well prepared in terms of interpreting research findings and understanding the implications of those findings," he says. "I especially learned about this from Jerry Rudy, who had a big influence on me." He speaks with great appreciation for Professor Rudy, his faculty advisor at CU. "Jerry was a fabulous mentor and friend. I can't begin to repay what I gained from my contact with him." Dr. Castro notes that Professor Rudy was an excellent role model in terms of mentoring and strongly influenced his mentoring style with junior officers in the military as well as doctoral and postdoctoral students at USC.

Dr. Castro remembers throwing himself into his studies at CU, working non-stop on his research, collecting



data, writing papers and being absolutely immersed in the whole research process, which was hugely satisfying to him. "I haven't really been able to have that level of immersion since," he says wistfully. "There was a constant push to be better and better, which I really enjoyed." Most importantly for his future military research, he says he learned how to "take things to the next level where the application of findings can actually have an impact on improving lives."

When he returned to the military after his doctoral training, he started working in earnest on that next level. At the Army's request, he began examining how transitions involving deployments and combat stressors influenced the mental and behavioral health of service members, veterans and their families. Working with grants from the Department of the Army, the Department of Defense, and other organizations, he developed leading theoretical models about the impact of military transitions and other behavioral health issues, and went on to apply those theories to implementing effective interventions. In the process, he authored over 150 scientific publications and was a highly sought-after lecturer on military mental health at scientific and military conferences. He was also involved in promoting policy change, serving on national, international and governmental advisory boards; he is currently Chair of a NATO research group on Military Veteran Transitions. After 33 years of service, including two tours in Iraq and peacekeeping missions to Saudi Arabia, Bosnia and Kosovo, Dr. Castro retired from the Army at the rank of colonel.

Then the unexpected happened: Dr. Castro found himself once again in an academic setting, landing at USC in Los Angeles as an assistant professor in Social Work. He had not anticipated this particular turn in his career path. "I actually had no aspirations to return to academia," he says, "but Dean Flynn at USC recruited me and made me an offer I couldn't refuse." His long-standing ability to adapt served him well and he quickly felt right at home. "It's been a perfect fit for me. I get to pursue my scholarly research activities, and the Dean is fantastic. I couldn't have landed in a better spot."

This sentiment echoes his experience at CU-Boulder. In reflecting on Dr. Castro's time at CU, Professor Rudy remarked, "Once in a while you get lucky and a really great student comes into the lab. Carl was one of those rare ones. He was completely self-directed and brought great energy to the laboratory. He made us all better and made being in the lab fun. When he left to return to the military I knew that he would rise to the top."

—Alicia Segal

In Memoriam

Sean Hudson (1989-2015)

Sean Hudson was a fourth-year student in our social psychology PhD program. He had accepted an offer to join my lab when I was at the University of Chicago, but then I moved, and he ended up coming to Colorado. His research focused on the idea that, when we encounter people of a different racial group, we typically have difficulty visually distinguishing between them, and that this difficulty in *seeing* might translate into difficulty *thinking* about them as individuals. His research was aimed at helping us avoid stereotypes and prejudices that arise from thinking that members of another race are “all alike.” Sean was killed on December 12, 2015. It is fundamentally ridiculous to think that I can capture in a few paragraphs what he meant to us, the members of the psychology department, but I want to try. He was a scientist with a blindingly bright future, a remarkable teacher, and a wonderfully generous spirit who made those around him feel at home—made us feel like we had a good friend.

As a student and a researcher, Sean was stunningly smart. But honestly, for me, it wasn't his cognitive horsepower that made him stand out academically. What I loved was that he thought differently than most of us. I remember, very early on—before he had even enrolled as a graduate student—we met to talk about a scientific paper. I had just discussed this same paper with a group of ten very smart graduate students in a seminar at the



University of Chicago. As I talked with Sean, he began raising questions and commenting on fundamental aspects of the research that no one else had noticed—not the ten smart students, not me. He did that kind of thing all the time.

The faculty and students in our program have often noted how profoundly Sean's comments enriched discussions. It was wonderful to talk with him about ideas because he obviously enjoyed it so much. He gravitated to big questions, and he loved the process of exploring them. He made those of us around him love that

process, too. Formally, I was his mentor, and I know I was supposed to be teaching him. But I learned a lot from him about how I want to approach research.

It is as a teacher that I think Sean was most truly gifted (professionally, at least). Funny, smart, devoted, and unswervingly compassionate to his students. He was a teaching assistant for our graduate statistics class. So his job was helping *other graduate students* learn statistics. This is a trick—it requires both a deep understanding, and the capacity to clearly communicate remarkably subtle ideas. His students would all tell you: he excelled in this domain. He worked hard to prepare, he worked hard to help them understand. Many of those students came to think of him not just as a teacher, but as a friend.

Beyond his work, Sean was a wonderful person—a precious, kind soul. He reached out to new students, to people who were upset. He did everything he could to protect them and make them comfortable. This is where words fail me most. He was a huge support to all of us, and I miss him so much already.

Sean was obviously just getting started—in our field and in life. He had a huge impact on so many of us in a few short years. My heart breaks when I think of what his life could have been, of all the good he could have done, all the students he would have mentored, all the people who could have known and loved him—people who will never know their own loss. He will be painfully and deeply missed by those of us lucky enough to have spent at least some of our time with him.

(Contributed by Associate Professor Josh Correll, Sean's faculty advisor)

NOTE: Sean Hudson will be awarded a posthumous PhD in Psychology at commencement in Spring 2016.



Sean (far right) with fellow graduate students after finishing comps.



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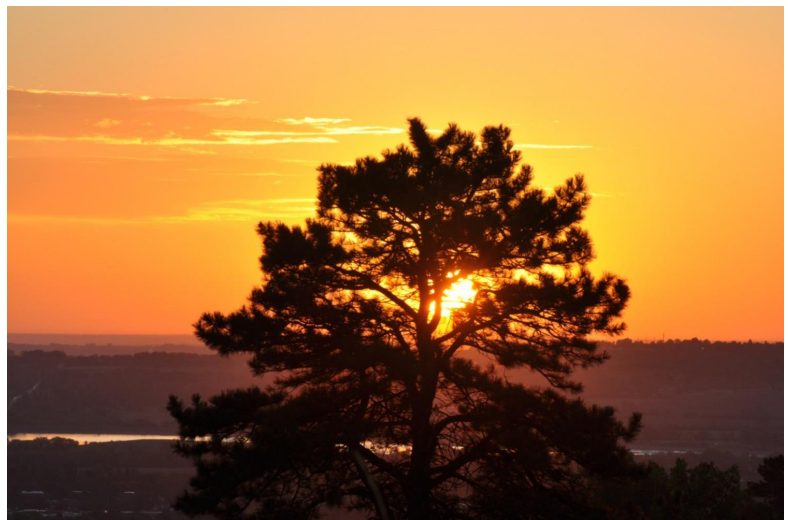
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