

# Psychology & Neuroscience News

## Lab Class Enhances Neuroscience Major

Senior Instructor Dr. Heidi Day marvels at the impact of a good hands-on lab experience. “Sometimes it’s not until you see something for yourself that it begins to have meaning for you,” she says. “It’s like looking at a bunch of arbitrary dots on a map as opposed to being familiar with a location. You can see London on a Google map but if you’ve been to London, you’ll have a whole set of associations and know it on a very different level.”

Dr. Day brings her 20-plus years as a neuroscientist and her love of hands-on inquiry to the CU classroom in her undergraduate course *Laboratory Techniques in Neuroscience*. This class allows students to metaphorically walk through the streets of London, giving them practical experience in a neuroscience lab while sharpening their skills in statistics, scientific reading and writing, and critical thinking.

The lab techniques class was added last year to the curriculum for the flourishing neuroscience major. It reinforces the *Introduction to Neuroscience* course which is more conceptually based. For example, students learn



Dr. Heidi Day oversees students while they pipette DNA samples for quantitative PCR (polymerase chain reaction) to determine changes in nervous system gene expression after an experimental manipulation.

that the physical structure of neurons influences their electrical properties. To demonstrate this in the lab, students compare conduction velocities (the rate at which electrical signals move along the neuron) in neurons with different physical properties. The lab class also tangibly reviews neuroanatomical knowledge gained in the introductory neuroscience course. A hands-on approach to gross neuroanatomy helps students learn to see neurocircuits in three dimensions. They also get an up-close-and-personal glimpse of microscopic neuroanatomy, observing neurons and glia in brilliant fluorescent patterns under research-grade microscopes. Students seem most impressed with observing what they’ve often only read about—one student excitedly

told Dr. Day, “I’ve studied neurons but this is the first time I’ve ever actually seen one!”

In addition, students in the lab class receive practical training in experimental design and modern experimental techniques. Based on this training, they design and run their own experiments to investigate potential changes in gene expression in the nervous system. Dr. Day explains that students then work with the data they’ve gathered. “They have to analyze their own data using statistical methods learned in other classes, and write up everything in the style of a scientific journal as if they’re attempting to be published,” she says. “All of this involves gaining and integrating a variety of knowledge and skills.”

Hardik Patel, a neuroscience student who took the lab class last spring, believes that the class was an important building block in his neuroscience program. “It was a **(Continued on page 3)**

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## In Memoriam: Kenneth R. Hammond (1917-2015)

Professor Emeritus Kenneth R. Hammond passed away in April 2015 at the age of 98. The following are contributions from some of his former students and colleagues:

Ken Hammond was born in San Francisco, California, in 1917. He received his BA, MA, and PhD from the University of California, Berkeley. In 1948, he accepted an appointment in the Department of Psychology at the University of Colorado Boulder, where he taught until his retirement in 1987. There, he co-founded the Institute of Behavioral Science and co-founded the Center for Research on Judgment and Policy. He was a visiting professor at the Universities of Hawaii, Berkeley, and Arizona, as well as a visiting scholar at the International Institute for Applied Systems Analysis and the Rockefeller Foundation Bellagio Center. His research was supported by the National Science Foundation, the U. S. Public Health Service, the Army Research Institute, the Office of Naval Research, the Commonwealth Fund, and other private foundations. In 1982, he was awarded an honorary doctorate from the University of Uppsala, Sweden. In 1987-88, he served as the second President of the Society for Judgment and Decision Making.

Over the course of his illustrious career, he published over 100 articles, wrote seven books, and edited five. The importance of his contribution to cognitive theory continues to be manifest in the work of his students and colleagues in such disparate fields as medical decision making, human factors, public policy analysis, group decision and negotiation, educational research, social work, human technology interaction, and weather forecasting.



Based on the work of his mentor Egon Brunswik, Professor Hammond proposed a general framework for the study of human judgment, Social Judgment Theory (SJT), which recognizes that uncertainty creates the



need for judgments to be based on multiple fallible indicators, and explores the implications of judgment processes for interpersonal learning, disagreement, conflict, and social policy. In a series of remarkable papers during the 1960s and 1970s, Professor Hammond adapted and extended Brunswik's Lens Model to the study of individual judgment, interpersonal learning, and cognitive conflict, placing his own distinctive stamp on the field, but never failing to recognize and champion Brunswik's ideas. In 2001, Professor Hammond co-edited *The Essential Brunswik: Beginnings, Explications, Applications*, which contains a collection of Egon Brunswik's papers together with commentaries.



Ken Hammond demonstrated a commitment to scholarship and placing research on judgment and decision making in its proper context in the history of thinking about how people cope with complex, uncertain environments. This was matched by his commitment to integrating diverse research paradigms and to improving the methodological and theoretical foundation of work on judgment and decision making. His work was distinguished by an uncommon ability to recognize the practical implications of theory and research and by his attempts to apply research to the improvement of public policy decisions. His 1996 book *Human Judgment and Social Policy: Irreducible Uncertainty, Inevitable Error, and Unavoidable Injustice*, won the 1997 Outstanding Research Publication Award from the American Educational Research Association. In 2007, *Beyond Rationality: The Search for Wisdom in a Troubled Time* explored the tension between theories of correspondence, whereby arguments correspond with reality, and coherence, whereby arguments strive to be internally consistent. He argued for a middle approach, particularly in matters of policy, that draws from both modes of thought and therefore avoids the blunders of either extreme.

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## Message from the Chair



You will notice that the title of this newsletter is now “Psychology & Neuroscience News”—aptly and accurately labeled as such to match our department’s full name. “Neuroscience” was added to our department’s name in 2008 and we added a neuroscience major in 2013. All of this reflects the breadth and depth of our department. Neuroscience focuses on the *how* and *why* of the brain from a neural (cellular) perspective. As you will read, Dr. Heidi Day teaches students the *hows* and *whys* through her *Laboratory Techniques in Neuroscience* course. As she describes, it is the hands-on nature of the course that provides our students with a powerful lens through which to discover the brain and its workings. Also contributing to our students’ understanding is the new *Psychological Science 2: Research Methods in Psychology*. As stated by Professor Robert Spencer, associate chair for undergraduate education, these opportunities for investigation

and inquiry can result in students being captivated by the discipline, engaged in their coursework, and looking towards a future in the field. I still recall the courses I took as an undergraduate in which I studied, visualized, and measured the *hows* and *whys* of the brain. That captivation and engagement continues in my brain to this day, as it does for many of my colleagues who you will read about in this newsletter. And fortunately for each of us, it is part of our job to provide similar opportunities for students in the Department of Psychology and Neuroscience, at CU, and in the community so as to foster continued interest in this important field.

In other terrific news, we had three successful new faculty searches. We welcome Professor Christopher Loersch starting this fall, and Professors Zoe Donaldson and Dajiang Liu, joining us in 2016.

—Theresa D. Hernández

### Lab Class Enhances Neuroscience Major (continued from page 1)

fantastic course because it allowed me to apply what I learned in my other neuroscience classes. Personally, I’ve been able to apply the techniques I learned in the class to my senior thesis research.” (See the article on page 5 for details about Hardik’s research.) He talks about the presence of Dr. Day as a resource in itself: “She was always happy to clarify questions or discuss students’ future goals,” he says. For students like Hardik, who anticipate careers in a neuroscience field, it’s invaluable to have this kind of access to an experienced neuroscientist in a realistic lab setting.

CU’s psychology majors are similarly supported with hands-on research classes such as the new *Psychological Science 2: Research Methods in Psychology* course. Professor Bob Spencer, associate chair for undergraduate education for our department, says this class parallels the neuroscience lab class in many ways, with students in the *Methods* course doing lab exercises, designing and



Students look at the electrical activity in different neurons to compare conduction velocities.

conducting experiments, and collecting and analyzing data, all with human subjects.

Professor Spencer believes it’s essential in our field of study to have courses that encourage investigation and inquiry. “We’re far from being a mature field that has all the answers,” he says. He maintains that psychological and neuroscientific research is fundamental to the mission of understanding the mind. “The reason neuroscientists want to understand the brain is because of what emerges from the brain—the mind. Understanding the mind,

how the mind emerges out of the brain and how the brain functions in all its complexity, is probably the greatest challenge for science. We have the most to learn of all scientific disciplines; we’re at the early frontiers of being able to answer our own questions. The most important thing we can do is to investigate further, and support our students in this endeavor.”

—Alicia Segal

## Research News

### Developing Executive Function *by Professor Yuko Munakata*



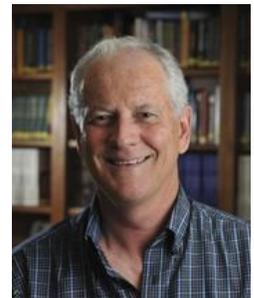
“Why is my kid misbehaving?” Chances are this has something to do with their developing executive functioning. Executive functions are a collection of cognitive processes, which allow individuals to override impulsive actions in order to achieve longer-term goals. Children can show limitations in executive functioning when they blurt out answers in class instead of raising their hands, or try to sneak cookies before dinner—despite being able to repeat the rules about how they should behave. This is not simply a matter of rebelling. In my lab, we can reliably elicit this type of behavior even when children are motivated to do well. Children’s executive functioning impacts not only their ability to control their behavior in the moment, but predicts important life outcomes decades later.

My research focuses on why children struggle with executive functioning, what processes support the dramatic developments children show across the first decade of life and beyond, what benefits as well as costs come along with these developments, and how this information might inform efforts to intervene. As one example, we have developed a new understanding of why children often cannot stop themselves when they are in the midst of doing something wrong. We have discovered that children tend to engage executive functions *reactively* (in the moment as needed), rather than *proactively* (in an anticipatory way). We have also found that mature inhibitory control depends upon proactive processes. Adults can do more than try to stop themselves while they are in the midst of doing something inappropriate (like reading text messages during a dinner outing); they can proactively watch for relevant cues (like the dismayed look on a companion’s face when the phone buzzes) and anticipate the need to stop. Together, these discoveries suggest that children’s inhibitory control might be improved if they practice proactively watching for relevant signals in the environment. In my lab, we have confirmed that such practice is effective—even more so than practice with actually stopping inappropriate actions.

Some of our latest work focuses on the role of social factors in developing executive functioning. We have found that how much children trust an adult influences whether they will delay gratification (holding out for two marshmallows later from that adult instead of eating one marshmallow now). In addition, the more time that children spend in less-structured activities like free play and social activities, the better some aspects of their executive functioning are.

### Genetics and Addiction *by Associate Professor Michael Stallings*

The goal of our research group is to understand genetic and environmental contributions to addiction vulnerability. Addiction involves multiple biological and environmental processes. Further, addiction develops over time. Different genetic and environmental factors are likely to be involved in substance initiation than in the progression to abuse and dependence. Substance use also typically occurs within a spectrum of comorbid psychopathology including disruptive behavior such as attention deficit-hyperactivity disorder, antisocial behavior, and risky sexual behavior. Understanding the addiction process must take this comorbid context into account. CU’s Center for Antisocial Drug Dependence was designed around this hypothesis. As a founding principal investigator of the Center, much of my lab’s work involves that collaborative project. The Center’s research participants include twins and their non-twin siblings, adoptive families, families of adolescents selected for severe substance abuse and antisocial behavior, and unselected families with an adolescent matched to characteristics of the selected adolescents (approximately 8,500 participants). The adolescents, age 12 to 18 at the initial assessment, have been longitudinally followed into adulthood (mean age 26.3) using a comprehensive assessment battery that provides us detailed views of subjects’ substance use histories and comorbid psychopathology—as well as detailed assessments of environmental context. Recently, fMRI assessment has been added to the assessment battery.



We have made important contributions to the literature suggesting that vulnerability to addiction is a generalized phenomenon. Further, our studies support the hypothesis that the genetic link between substance use disorder, externalizing behavior, and risky sexual behavior is mediated through a constellation of individual characteristics that have been characterized as behavioral disinhibition (BD). We completed the first genomewide association study of BD, and are currently in the process of building a consortium of studies with similar data to conduct more large-scale investigations. I am particularly excited about incorporating fMRI-based phenotypes into our work in the near future.

## Faculty News



**Professor Richard Olson** was named College Professor of Distinction by the College of Arts and Sciences. According to the dean, “this prestigious award recognizes the highest achievements in all aspects of the academic mission, including research, teaching, and service. The award is granted only after rigorous review by the Arts and Sciences Personnel Committee. It is awarded only to our most accomplished faculty.”

### Promotions and Reappointments

Within the department: **Irene Blair** was promoted to full Professor; **Matt Jones** was promoted to Associate Professor with tenure; **Peter Grace** was promoted to Research Assistant Professor; **Ruth Barrientos** was reappointed as Research Assistant Professor; **Diane Sasnett-Martichuski**, **David Allen**, and **Natalie Smutzler** were reappointed as Senior Instructors.

**Associate Professor Greg Carey** received a Boulder Faculty Assembly (BFA) Faculty Recognition Award for 2014-15. The award is given to faculty members who have demonstrated continued support to the CU community through their service activities.



**Chris Loersch** accepted the position of Assistant Professor in social psychology as of August 2015. He received his PhD from Ohio State University in 2009 and held post-doctoral appointments at the University of Missouri and CU-Boulder. He studies the cognitive processes that influence social judgment, behavior, and motivation outside of conscious awareness.

## Undergraduate Research: Hardik Patel

Neuroscience major Hardik Patel says he’s grateful to have taken *Laboratory Techniques in Neuroscience* (see feature article in this issue). In this course, he gained skills and learned techniques that he’ll use during the preparation of his senior honors thesis.

Hardik’s thesis project investigates the depressive-like symptoms caused by chronic pain in rats and will determine if treatment with an adenosine 2A receptor (A2AR) agonist reverses these depressive-like symptoms. A2AR agonists are believed to exert their effects through anti-inflammatory pathways, and because depression-like disorders involve neuroinflammation, this treatment could be promising. An enormous advantage of A2AR agonists is that a single treatment lasts weeks, unlike typical analgesics such as morphine that only last a few hours. Because of this as well as other desirable characteristics, tolerance and addiction are less of a concern. In terms of broader implications, Hardik explains, “The results of this study are predicted to support a link between long-term mental illnesses and chronic pain rooted in neuroinflammation. Our research may provide insights on how to more effectively treat chronic pain: not just the pain, but also the mental consequences.”



Hardik traces this research interest to his freshman year, when he was drawn to the study of depression. He questioned if chronic pain had impact on depressive-like behaviors, and found a home for his interests in the Maier/Watkins lab, which focuses, among other things, on chronic neuropathic pain and neuroinflammation. His faculty advisors, Professor Linda Watkins and Dr. Andrew Kwilasz, have been important resources through all phases of his project, helping design studies to move through the pilot

phase. Hardik plans to begin full-fledged experimentation this fall.

Hardik, who hopes eventually to apply to medical school, seems to be in his element with all stages of the research process. “Research can be tedious,” he says, “but I’ve found joy in all aspects of research, from reading literature to conducting experiments.” And while he has plenty of other excitement in his life (he’s the executive director of CU’s national honor society in neuroscience—Nu Rho Psi, not to mention an avid motorcyclist and taekwondo athlete), he admits his heart is in his research: “I enjoy all the challenges and thrills that accompany laboratory work.” —*Alivia Segal*

## Highlights from Alumni News on our Website

Alumni who sent us updates over the past year are listed below. You'll find a full account of their news, as well as updates submitted by other alumni over the years, on our Alumni News website. To find the Alumni News website, first go to the department website ([www.colorado.edu/psych-neuro](http://www.colorado.edu/psych-neuro)). Under **Quick Links** at the bottom of the page, click on **Alumni Resources** then click on the **Alumni News** link. You will initially see a "Permission Denied" message. For login information, email [psychology.news@colorado.edu](mailto:psychology.news@colorado.edu)

### 1950s

**Gloria M. Maupin, MD (BA '52)** went on to become an MD and recounted her professional path since her days at CU. Her story can be found on our website.

### 1960s

**Jon Hilbert (BA '60)** worked before retirement as an elementary school teacher for 18 years and an account executive and development director for 17 years.

**Rosalind (Linda Bruner) Braga, MA (BA '62)** retired in 2003 and enjoys teaching meditation (Tai Chi Chih) in the Bay Area, volunteering for a nonprofit, and advocating for the people of Congo in Africa.

**Stephen Warren Link, PhD (BA '63, Psych, Sociology & Mathematics)** is currently working on a book about the foundations of psychophysics with application to experimental psychology and economics.

**Marideanne Bray Blomgren, MS (BA '66)** founded and is the director of the Anger and Relationships Institute in Princeton, New Jersey. Her main focus at this point in her life is her 11-year-old granddaughter.

**Jacob (Jack) Hautaluoma (PhD '67)** does work with conflicts in organizations, organizes a monthly meeting of retired psychology academics in Ft. Collins, and is active in the social concerns committee at his church.

**Harry Frank (PhD '69)** and his wife Martha completed a 13-year odyssey photo-documenting military and trading forts of the Indian wars era, producing the DVD video *Forts of the Frontier West*.

### 1970s

**Barbara Doe Fahey (BA '72)** was recently recognized by the Western Extension Director's Association with the Award of Excellence for the Native Plant Master® program that she founded.

**Steven P. Mitchell, BS, BA (class of '73)** retired in 2011 from 22 years as a high school social studies teacher and coach. He enjoyed teaching psychology, having previously worked in the field of counseling.

**Damon Tempey (PhD '74)**, spotlighted in a previous newsletter article about Professor Peter Ossorio, con-

tinues to work full-time as a clinician. He shares news about a colleague's lecture on descriptive psychology.

**Janet Watson (BA '79, Psych & Communications)** was promoted to senior faculty advisor within the Berkeley Haas School of Business. She also does private consulting with women in leadership roles.

### 1980s

**Jim Alexander (PhD '82)** is senior director of engineering at the cable company Charter Communications. He is a candidate for the CU Board of Regents seat (District 1) which is up for election in November 2016.

**Ruth Marie Schilling (BA '82)** currently works at Gallaudet University in Washington, D.C., as a mental health counselor. She has been at Gallaudet University since 1985.

**Sharon E. Anderson (BA '85 Psych & Education)** recently changed positions at CU-Boulder. She is now the extracurricular programs manager in the College of Engineering and Applied Science.

**Lucinda S. Baker, PhD (BA '85)** recently completed a PhD program in psychology at CSU. She has been an instructor for the past six years at CSU and Front Range Community College.

**Grace (Neuvirth Johnson) Schmidt (BA '86)** is the city clerk for the city of Cupertino, California, where she says she uses her degree and understanding of human behavior every day.

**Robert Whitman, LPC, MA, CACIII (BA '86)** is in private practice as a licensed professional counselor. He developed the Marriage Counseling Therapy Network to connect therapists with those needing their services.

**Angelo De Marzo, MD, PhD (BA '87, Psych & MCDB)** is a professor of pathology and oncology at The Johns Hopkins University School of Medicine in Baltimore. His CV is posted on the alumni website.

**Kurt Michael, PhD (BA '88)** is a professor of psychology at Appalachian State University in North Carolina. He is also a researcher, editor, consultant, and practicing licensed psychologist.

### 1990s

**Keri R. Werner (BA '90)** lives in Chicago with her husband, daughter and son, and works independently as a certified personal trainer.

**Linnea S. Hord, RN, MS, ANP-C (BA '91)** is a certified adult nurse practitioner working with Optum/United Healthcare. She is also a clinical preceptor with CU College of Nursing and Regis School of Nursing.

**Ronald R. Baptist (MA '92), LPC** works full-time in his own private practice partnership, Associates for Wellness, LLC, in Colorado Springs. He specializes in working with trauma, PTSD, and affective disorders.

**John Ellis (BA/BS '99, Psych & Business)** is senior director of database for Elavon, a payment processor subsidiary of USBank. He recently moved to Golden, Colorado, with his wife and two young children.

### 2000s

**Matt LoPresti, PhD (BA '01)** shared his military bio which tracks his academic achievements and military service since graduating from CU. His bio is posted on the alumni website.

**Mitchell Chrismer, MA (BA '02)** is a senior program associate for the U.S. Institute for Environmental Conflict Resolution, a federal agency that focuses on resolving environmental disputes over public lands.

**Ben Rosenberg, PhD (BA '06)** recently completed his PhD in social psychology at Claremont Graduate University in Claremont, California. He plans to move to Utah to work with a research consulting company.

**Daniel Cashmore, MS (BA '07)** left his consulting business two years ago for a career in Fire and Emergency Medical Services. He is a firefighter/EMT at Boulder Rural Fire Rescue and an EMT in Longmont.

**Dana Louise Martin, MA (BA '08)** is working toward her doctorate in clinical psychology in Chicago. She is currently an advanced psychotherapy extern with an integrated primary care group psychology practice.

**Ernest Kim, DC, LAc (BA '09)** is a licensed chiropractor and acupuncturist in Los Angeles and says his psychology degree has been very useful in his career.

**Rachel Overton, MSW (BA '09)** recently completed a master's of social work at Metropolitan State University of Denver and works as a child protection caseworker with Boulder County.

### 2010s

**Heather Berry (BA '10)** works in the Data Integrity Unit of Intrado, managing data in the 9-1-1 database.

**Christopher D'Lauro (PhD '10)** is completing his fourth year as an assistant professor at the U.S. Air Force Academy. After receiving his PhD, he did a short postdoc with Mike Tarr at Carnegie Mellon.

**Sabeen Ahmed, ASW (BA '11)** completed a social work degree at Columbia University and is now working as a mental health therapist at Pacific Clinics, a mental health agency in Pasadena, California.

**Haley Zlomke, MS (BA '11)** is finishing her first year of medical school at Rutgers University's Robert Wood Johnson Medical School. She was married on her first day of med school orientation in August 2014.

**Colin M. Bosma (BA '12)** is a senior research assistant in the Langer Mindfulness Lab at Harvard University. He will be a clinical psychology doctoral student this fall at the University of Maine.

**Emily Fredette (BA '12)** is pursuing an education specialist degree (EdS) at Lewis & Clark College in Portland, Oregon. She works as a full-time intern at a middle school serving a diverse, high-needs population.

**Marisa Harrell (BA '13)** teaches second grade at Tarver Elementary School in the Adams 12 school district in Colorado. She is in the process of applying to CU Denver for a PsyD in school psychology.

**Hillary Jensen (BA '13)** recently moved to Pittsburgh, Pennsylvania, where she received an offer to work at Western Psychiatric Institute and Clinic in their schizophrenic and psychosis unit.





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Visit our Alumni News website for updates from alumni who sent us news.

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To find the Alumni News website, first go to the department website at: [www.colorado.edu/psych-neuro](http://www.colorado.edu/psych-neuro)

Under **Quick Links** (bottom of the page): Click on **Alumni Resources**, then click on the **Alumni News** link.

For login information, email [psychology.news@colorado.edu](mailto:psychology.news@colorado.edu).

### What's new with you?

Share news about yourself on our alumni website.

Please include:

- Your name
- Your degree(s)
- The year that you graduated from CU

Feel free to add descriptive information about yourself such as:

- Professional activities
- Family news
- Other activities of interest
- Insights into how your CU degree has helped to shape your life and work

Send your news to: [psychology.news@colorado.edu](mailto:psychology.news@colorado.edu)



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For questions about donations, please contact Amy Metz at (303) 541-1464 or [Amy.T.Metz@colorado.edu](mailto:Amy.T.Metz@colorado.edu)

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