

AY 26-27
GRADUATE/UNDERGRADUATE DIRECTED STUDY OPPORTUNITIES
& UNDERGRADUATE HONORS OPPORTUNITIES

Prof. Catherine Caldwell-Harris (charris@bu.edu). My research concerns cognition, language, and the brain. I have projects on bilingualism, psycholinguistics, and cross-cultural aspects of emotion and language. I also study special interests in autistic teens and adults, and other topics in neurodiversity, and have a new project on compulsive media use. I encourage students to begin the directed study by working on one of the existing projects in the lab, and then to develop their own study in conjunction with me and other lab members.

Prof. Michael Hasselmo (hasselmo@bu.edu). Students with a strong interest in neurophysiological mechanisms of memory function may have the opportunity to perform projects involving training of rats and gathering of physiological data. This requires a strong background in courses related to neuroscience. There are also opportunities for interested students in computer modeling of memory function in cortical networks. This requires some background in mathematics, programming or neural network theory.

Prof. Jana Iverson (iversonj@bu.edu). The Infant Communication Lab studies the nature and development of the relationship between motor activity, postural stability, communication, and language in infants at risk for autism and infants with no such risk. Current projects focus on four major topics: a) how changes in motor activity and postural stability relate to advances in other developmental domains; b) how motor planning develops over time; c) how communication, gesture, and language develop over time in infants; and d) how caregivers' communication with infants changes over time and in relation to advances in motor development.

Prof. Deb Kelemen (dkelemen@bu.edu). Research in the Child Cognition Lab focuses on children's conceptions of animals, people, and human-made objects. Depending on the specific project, directed study participation may include subject recruitment, data entry, assisting in the design stimuli (drawing and Photoshop skills are always in demand!), some child interviewing with training.

Prof. Sam Ling (samling@bu.edu). Sensation is easy –even a camera can sense light. For a camera, light simply falls onto film, creating a photograph of what was seen; the story ends there. For humans, however, the moment light falls on our retina is but the beginning of an exceedingly complex process, culminating in our rich perceptual experiences. It is this remarkable process that sets our visual system far apart from simple devices such as cameras: our brain's ability to perceive and consciously experience the visual world. Our lab's work centers on that pivotal stage of cognitive processing –the stage at which sensation becomes perception. Our research combines a variety of techniques, including psychophysics, computational modeling, and functional magnetic resonance imaging (fMRI) –all aimed towards understanding how the brain mediates between the 'buzzing confusion' of the visual environment and our limited processing power.

AY 26-27
GRADUATE/UNDERGRADUATE DIRECTED STUDY OPPORTUNITIES
& UNDERGRADUATE HONORS OPPORTUNITIES (continued)

Prof. Qimin Liu (qiminliu@bu.edu) (LOA Sem I). The Quantitative Psychopathology Lab focuses on the application and development of innovative statistical methods and software to study severe emotional disturbances, particularly among marginalized adults. Our current projects include (1) investigating the relationship between adult irritability, depression, and suicide; (2) examining stigma and health outcomes among LGBTQ+ individuals; (3) constructing multimodal representations of naturalistic affect in conversations and their relation to affective disorders; and (4) developing novel statistical models and software for social and behavioral data analysis. We especially welcome students with interdisciplinary interests and experience in data science, statistics, computer science, or public health to join our team. For more information about the lab, please visit: <https://sites.google.com/bu.edu/qpl>.

Prof. Kristin Long (kalong@bu.edu). Our lab focuses on (1) reciprocal influences between a child's medical illness or disability and their family and cultural context, (2) culture and health equity across the life course, particularly in the context of medical illness or disability, and (3) the development and evaluation of family-centered, culturally-sensitive psychosocial interventions. The majority of our work is carried out in the context of childhood cancer, sickle cell disease, and autism. Please visit our website for more information (<http://sites.bu.edu/childandfamilyhealth/>).

Prof. Joseph McGuire (jtmcg@bu.edu). We study decision making in humans using the tools of computational cognitive science. Our goal is to understand the information processing operations that enable people to make good decisions in the face of delay, uncertainty, and setbacks. Our methods include behavioral experiments, eye tracking, computational modeling, and brain imaging. Directed study students can participate in data collection, data analysis, literature review, and theoretical modeling. Experience or interest in computer programming is beneficial (R, Python, Matlab, etc). See sites.bu.edu/cdlab for more information about the lab.

Prof. Susan R. McGurk (mcgurk@bu.edu). My training is in both clinical and neuropsychology. My research addresses cognitive impairments in psychiatric illness, and their relationship with community functioning. Our research program is focused on the development and evaluation of cognitive enhancement strategies, such as restorative task practice and compensatory strategies, in improving work functioning in persons with serious psychiatric illness.

Prof. Samuel Meisel (smeisel@bu.edu). The SUMMIT lab seeks to help adolescents successfully navigate the teenage years by studying how to best reduce the risks of initiating, escalating, or continuing to use substances. We are particularly interested in the role of social relationships, such as peer and caregiver relationships, and how they interact with multiple levels of influence (e.g., temperament, schools, neighborhoods) to influence adolescent substance use etiology and treatment. The overarching questions that guide our work include: (1) What are the developmental pathways leading to adolescent substance use? (2) What are the key ingredients of adolescent substance use treatments that lead to behavior change? (3) How do we leverage developmental science and work on key ingredients to improve and scale adolescent substance use treatments? For more information about the lab, visit: <https://sites.bu.edu/summitlab/>

AY 26-27
GRADUATE/UNDERGRADUATE DIRECTED STUDY OPPORTUNITIES
& UNDERGRADUATE HONORS OPPORTUNITIES (continued)

Prof. Heidi Meyer (hcmeyer@bu.edu). My research uses rodent models to investigate questions about brain and behavioral development, with a strong focus on adolescence. We use behavioral and systems neuroscience techniques to understand how communication between brain regions influences decision making and behavioral control in the face of fear and reward stimuli. I welcome students interested in addressing psychologically grounded questions with neuroscience techniques.

Prof. Kate Nussenbaum (katenuss@bu.edu). The Computation, Learning, and Development Lab aims to understand developmental changes in value-guided learning, memory, and exploration from childhood to early adulthood. We use behavioral studies, computational modeling, and fMRI to address questions about how and why learning processes change over time and through experience, and what the consequences of those changes are for goal-directed behavior. Undergraduate research assistants typically work closely with a more senior lab member to recruit and screen participants, review literature, design and program experimental tasks, analyze data, and prepare findings for presentation and publication. Most of our research involves computer programming but we are open to students of all backgrounds. For more information, please visit bucoldlab.org

Prof. Michael W. Otto (mwotto@bu.edu). Much of my current research focuses on strategies to increase the retention of therapeutic learning - strategies that are designed to provide more efficient treatment of anxiety, mood, and substance use disorders. Ongoing projects include those that focus on (1) identifying core factors in psychopathology and its treatment (with an emphasis on the role of distress intolerance across a wide variety of disorders), (2) issues in the acquisition or maintenance of health behaviors (smoking, exercise, and medication adherence), (3) psychosocial and biological predictors of successful treatment outcome in adults undergoing exposure-based cognitive behavior therapy for anxiety-related disorders, and (4) the role of app-based therapy in treatment outcome.

Prof. Tibor Palfai (palfai@bu.edu). My primary research interests are: (1) understanding the cognitive-motivational processes underlying health risk behaviors (e.g., hazardous/harmful drinking, substance use, risky sexual decisions) and (2) developing psychological interventions to reduce these risks. Specific areas of research include, (1) web and mobile-based interventions to reduce hazardous drinking and substance use, (2) laboratory studies on the effect of alcohol on self-control and decision making processes related to health risk behaviors, and (3) screening and brief intervention to modify HIV-risk factors and (4) developing integrated, behavioral interventions for patients in medical settings (e.g., HIV-care, primary care) who are experiencing co-occurring conditions (e.g., chronic pain and heavy drinking).

AY 26-27
GRADUATE/UNDERGRADUATE DIRECTED STUDY OPPORTUNITIES
& UNDERGRADUATE HONORS OPPORTUNITIES (continued)

Prof. Kim Saudino (ksaudino@bu.edu) My research is in the area of early childhood temperament. I am currently working a twin study examining developmental change in temperament across the preschool period. The temperament dimensions of negative emotionality, positive emotionality, activity level, attention, persistence, shyness and inhibitory control is longitudinally assessed via multiple methods (e.g., behavioral tests, observations, actigraphs and parent ratings) in a sample of 300 twin pairs at 3, 4, and 5 years of age. Parent report and observational measures of parenting behavior are also obtained at each age. Developmental outcome measures include externalizing and internalizing behavior problems, prosocial behavior, and academic readiness. The specific aims of the study are to: 1) Explore individual differences in developmental change across the preschool period using observational measures of temperament in addition to parent ratings; 2) Assess links between child temperament and parenting trajectories. 3) Explore relations between temperament trajectories and developmental outcomes at age 5; and 4) Examine genetic and environmental influences on individual differences in temperament trajectories.

Prof. David Somers (somers@bu.edu). I am interested in the mechanisms of visual perception, recognition, and attention. How is visual information encoded in the mind and brain? How is it used for recognizing objects? How does attention modulate these representations and processes? Can we achieve a computational understanding of the brain mechanisms that support these functions? My research employs visual psychophysics and functional magnetic resonance imaging (fMRI) of human brain activity. In addition, computational modeling techniques are used. Students interested in any of these methods and topics are welcome to apply.

Prof. Amelia Stanton (stantona@bu.edu). The Sexual, Reproductive, and Mental (SRM) Health Disparities Program focuses on the intersection of sexual, reproductive, and mental health in minoritized and marginalized populations, both domestically and internationally. We aim to (1) identify psychological barriers to optimal sexual and reproductive health and (2) develop psychosocial interventions that mitigate the influence of these barriers among populations at risk for poor sexual and reproductive health. Research opportunities for students include qualitative and quantitative data analysis, literature reviews, data management, and interface with international collaborators. For more information about the lab, please visit: sites.bu.edu/srmhdisparities.

Prof. Amanda Tarullo (atarullo@bu.edu). My research examines how early life stress affects child development and how to build resilience in early childhood. Current studies include (1) a randomized controlled trial of parent coaching interventions to help low-income families whose toddlers have sleep and behavior problems and (2) investigation of home language environment in Latinx families in relation to preschool children's executive function and vocabulary.

AY 26-27
GRADUATE/UNDERGRADUATE DIRECTED STUDY OPPORTUNITIES
& UNDERGRADUATE HONORS OPPORTUNITIES (continued)

Prof. Martha Tompson (mtompson@bu.edu). My work is primarily focused on the role of the family in mental health across the lifespan. In collaboration with my graduate students, I have several projects in progress. First, with a colleague at MIT, we are conducting a pilot study to examine how evidence-based, family-focused treatment for depression (developed here in my lab) changes underlying neural processes associated with depression in 7-12 year old children. Second, my team is exploring how family support impacts adjustment and life satisfaction in emerging adults during the college years, with a particular focus on LGBTQ+ populations. Third, we are investigating how stress impacts cognition in Black, Latino and non-Hispanic White older adults and how social support may moderate this stress-cognition link. Finally, my team is working closely with Dr. Binyomin Abrams in Chemistry to develop a program to reduce academic stress among students taking STEM classes. Directed study students working in my lab learn about diagnosis and evaluation of depressive symptoms and disorder in youth, about family and individual treatment models for depression, about the role of social support across development and in different populations, and about how to measure stress. Students work in the lab 7 hours per week and participate in a 1 hour weekly lab meeting.

Prof. Nicholas J. Wagner (njwagner@bu.edu). My research investigates the enduring impact of early parent-child relationships on children's socio-emotional development, the mechanisms and processes by which psychobiological and environmental factors promote psychosocial adaptation or contribute to the emergence of psychopathology in children, and how self-regulatory processes augment or constrain these associations. Students will have the opportunity to gain experience with observational and psychobiological measurement. Depending on interests and the status of ongoing projects, students may assist with participant recruitment, data collection, observational coding, data entry and analysis, and the preparation of abstracts, posters, and manuscripts. Only students who have worked in the lab for a minimum of 2 semesters will be eligible to complete a Directed Study or Honors Thesis.

Prof. Arash Yazdanbakhsh (yazdan@bu.edu). Our research approaches: a) computational modeling of biological neural systems by combining systems-level neuroscience, mathematical techniques, and computer simulation by incorporating biophysical properties of neurons, b) anatomical, physiological, and psychological data through neural modeling, and c) studying visual perception by computer generated visual stimuli, including 2D and 3D psychophysics, and eye tracking. Current ongoing areas of research in the lab use machine learning (ML), deep neural network (DNN), and neural networks by using imaging and microscopy data from public domain and from collaboration with other labs related to Parkinson's disease (PD), autism spectrum disorder (ASD), Schizophrenia (SZ), and Alzheimer's disease (AD). In joining the lab, you could participate in one or a few of these research activities: programming the experiment stimuli, developing deep networks or machine learning, recruiting participants, collecting and/or analyzing psychophysical, imaging, microscopy, or eye tracking data from the lab and collaborating labs or from public domain, presenting your work in weekly lab meetings, preparing abstracts, talks, posters, and manuscripts for publication.