Dr. Cobia's laboratory is focused on the implementation of computational anatomy tools to study neuropsychiatric diseases, particularly schizophrenia. His interests are in the clinical and biological heterogeneity that exists in schizophrenia by taking a cognitive neuroscience perspective. His work has involved linking cognitive and neurobiological characteristics to important clinical dimensions (e.g., negative symptoms) of the illness. Dr. Cobia also conducts research in a rare language-based dementia known as Primary Progressive Aphasia.

In his cognitive epidemiology research Dr. Hedges investigates factors that contribute to neurodegenerative diseases and neuropsychiatric outcomes with a particular focus on the effects of chronic infection and inflammation.

Dr. Gale’s research mainly focuses on neurologic populations including traumatic brain injury, epilepsy, stroke, and carbon monoxide poisoning, with an emphasis on the utilization of neuroimaging techniques and their correlation with cognition.

Dr. Higley’s research is focused on individual differences in developmental outcomes and psychopathology and focuses on the importance of parental and other environmental influences and genetic influences on the developing brain and its behavioral correlates. His research assesses the role of these factors on addiction, adding new perspectives on how genetic and environmental influences interact to produce behavioral outcomes. Research from his laboratory shows that traits such as impulse control, aggressiveness, and sociality competence are mediated by CNS serotonin functioning and that psychopathological behaviors such as severe impulsivity and alcohol abuse are found in subjects with impaired central serotonin activity. A second line of research studies the effect of gene X environment interactions. This re-search shows that psychopathological outcomes are a result of early parental treatment (or the lack thereof) which is modulated by genetic background.

Dr. Holt-Lunstad’s research examines the association between our social relationships and physical health and longevity, the pathways (e.g., cardiovascular, neuroendocrine, genetic, metabolic, immune, and neural) by which this association occurs, potential moderating factors, and how relationships may be applied in interventions aimed at improving health and reducing risk. Her work is interdisciplinary and takes a multilevel approach—utilizing diverse methods (self-report, biological, and behavioral data) and concepts.

My research focuses on brain-behavior relationships. One area of research examines the effect of critical illness on cognitive and psychological function (i.e., anxiety, depression, and posttraumatic stress disorder) and the relationship between cognitive function and brain imaging. Another area of research assesses whether interventions such as physical or cognitive rehabilitation can improve cognitive function following critical illness. A third area of research focuses on memory and how memory is affected following brain injury.
Dr. Kay is interested in understanding the mechanisms and functions of sleep. He investigates sleep disturbances in relation to transdiagnostic features of psychiatric disorders across units of analysis, from genes and circuits to self-report and behavior. His sleep research laboratory is currently conducting two major projects that will help answer how sleep can be used to prevent and treat psychiatric disorders such as depression.

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Dr. Kirwan is interested in how the brain forms and retains long-term declarative memories and how we use those memories to guide future actions. He uses functional MRI (fMRI), event-related potentials, and behavioral testing techniques in his research. More information about the Kirwan lab can be found at kirwanlab.org.

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Utilizing a convergence of information from neuropsychology and cognitive neuroscience methodologies to examine the mechanisms of cognitive dysfunction following traumatic brain injury (TBI). Event-related potentials (ERPs) and functional magnetic resonance imaging (fMRI) to show brain-based changes in how people monitor and manage their environment following head injury. Motivation, negative affect, and psychopathology (e.g., obsessive-compulsive disorder [OCD] and depression) in influencing cognitive control processes and concomitant brain activity.

Steven Luke, Ph.D.
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The major focus of my research is reading, which is a complex activity that involves many different processes, most notably language and vision. I also study other aspects of language, such as language development and word and sentence comprehension, as well as other visual tasks, such as scene perception and visual search. Many different groups participate in my studies, including children and adolescents, second language learners, and individuals from various clinical populations. In my research I primarily use eye-tracking technology, although I also use MRI and EEG to study how the brain understands and integrates visual and language information during reading and other tasks.

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Our research focuses on tracking developmental changes in cognitive abilities, such as attention, and investigating how these changes impact behavior, including academic success, the development of social problem-solving, and other functional skills. We have conducted studies of genetic influences on reflexive attention (attention to suddenly appearing stimuli), but are also interested in developmental changes with autism and following a concussion. We are hopeful that our research will eventually lead to more effective interventions that prevent or minimize developmental problems with cognition.

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Rebekka Matheson is a graduate of BYU’s Neuroscience Center and the University of Rochester School of Medicine, where she focused on neurology, psychiatry, and addiction medicine. While in Rochester, she also researched the neuroanatomy of reward circuitry and took graduate course work in the neurosciences. She is also trained in instructional design and has designed curriculum and courses for Western Governors University College of Health Professions, as well as teaching courses in their undergraduate and graduate programs.
In the Nielsen Brain and Behavior Lab, we are interested in answering questions about the organization of the brain and how neurological and psychiatric illnesses disrupt its organization. To answer these questions, we use a variety of analytical techniques to extract quantitative information from MRI scans.

Dr. South’s lab studies the contributions of the limbic system to the development of symptoms of autism spectrum conditions. He and his team are interested in the overlap between anxiety and autism using experiments designed to activate the amygdala, orbitofrontal cortex, and the anterior cingulate. His lab is currently involved in studies using a variety of psychophysiological measurements and EEG along with functional MRI.

Research in Dr. Steffensen’s lab is devoted to the characterization of neuronal circuits and adaptive neuronal processes involved in drug abuse and natural rewarding behaviors. In animal studies, using electrophysiological, neurochemical, immunohistochemical, microscopic imaging, and behavioral methodologies, we study the role of midbrain GABA neurons in regulating dopamine neurotransmission, which is dysregulated during alcohol dependence. In human studies, using electroencephalographic techniques, we study potential peripheral biomarkers of brain dopamine and treatment strategies to elevate brain dopamine. Dr. Steffensen’s goal is to identify what molecular substrates in the midbrain adapt to chronic drug use and to subsequently explore treatment strategies that might reverse drug dependence. This research is currently funded by two NIH grants.