Stonehill Undergraduate Research Experience (SURE) Summer 2019 Awards

Forty-nine Stonehill College students will work with twenty-four faculty members on a variety of research projects during the summer of 2019. The Stonehill Undergraduate Research Experience (SURE) program provides students with an opportunity to perform significant, publishable research under the guidance of an experienced faculty researcher. The research experience gives students a competitive advantage in graduate and professional school applications and in post-college employment opportunities, as well as to offer assistance to faculty in research activities.

Claire Shamber ’20 and **Jessica Williams ’20** will work with **Leyda Almodovar Velazquez**, Assistant Professor of Mathematics, and **Heiko Todt**, Associate Professor of Mathematics, on *Graph Labeling*. Graph labeling problems are not based on many previous developed theories, making them an appropriate topic for undergraduate research. This project will let the students experience what they will encounter in a graduate school program in mathematics. First, Shamber, a biology major, and Williams, a mathematics and physics double major, will collaboratively study introductory material to obtain a basic knowledge and understanding of graph labeling. The students will then either create their own problem or choose one provided and solve the problem under supervision of the faculty members. Upon solving the problems, a joint paper will be submitted to a national or regional conference for consideration. The researchers also hope to publish their findings in a peer-reviewed journal.

Ana Alcantara ‘21, Shivam Gandhi ‘21 and **Hannah Gross ‘20** will work with **Bronwyn Bleakley**, Associate Professor of Biology, and **Brian Haney**, Research and Teaching Fellow in Biology, on *Sensory Ecology and Physiology Underlying Cooperative Antipredator Behavior in Guppies, Poecilia reticulata* and *Role of Steroid Hormones in Structuring Cooperative Partner Interactions in Guppies, Poecilia reticulata.* Prior research has determined that both wild and inbred guppies cooperate with social partners, exhibiting numerous behaviors in response to predatory threats that are modulated by their interactions with their social partners. It is unknown whether responsiveness to social partners or influence on social partners among individual guppies is influenced by their physiology and/or sensitivity to visual, chemical, or mechanosensory cues. By studying the hormones excreted by guppies, and their sensitivity to other signals from their partners during interactions, the group hopes to understand if these factors affect cooperative interactions. Alacantara, Gross, and Gandhi, all biology majors, will assist with the extraction of hormones, conducting behavioral trials and the analysis of data to better understand animal physiology and behavior. They hope to publish their results in the near future.

Brandon Haffner ‘21 and **Bryanna Norden ‘20** will work with **Nicholas Block**, Assistant Professor of Biology, on *A Genetic Assessment of a Swallowtail Butterfly Hybrid Zone.* This project will examine the gene flow between and species-level relationships of Eastern Tiger and Canadian Tiger Swallowtail butterflies, as well as the size of their hybrid zone. Determination of the size and location of the zone and verification of the gene flow levels will confirm if the two should continue to be knows as two separate species or as one. Haffner and Norden, both biology majors, will work to collect samples of the butterflies, extract DNA, sequence genetic markers for each species, and conduct population genetic analyses to determine the gene flow between the two species. The ultimate goal of this project is to produce a data set that will lead to a research journal publication, written jointly by Block, Haffner, and Norden.

Caroline Coady ‘21 will work with **Matthew Borushko**, Associate Professor of English, on *Romanticism and How to Live.* This project will examine the literature of the Romantic Age in Britain, which spans from 1780-1840, with the motivating question of what romanticism can teach us about how to live in the twenty-first century. The researchers propose that authors of the Romantic Age were conscious of the effects these writings would have on their readers. Can the present-day reader still glean wisdom from these works? Coady, an English and history major, hopes to research and compose an essay making a claim about her specific interest in Spinoza’s influence on Romanticism and will submit it for consideration at the 2019 National Collegiate Research Conference. Borushko intends to use this collaboration to complete a book proposal and chapter draft for his current project. Additionally, they will create a digital blog entitled “Romanticism and How to Live” where they will coauthor posts which reflect on the ethical and practical implications of Romantic aged literature.

Jaqueline Davis '20 will work with **Kirk Buckman**, Assistant Professor of Political Science and International Studies, on *Party Systems and the Development of Democracy: The cases of Costa Rica, Nicaragua and Venezuela.* The project explores populism, party systems, and democratic development in Costa Rica, Nicaragua, and Venezuela through exploration of comparative political science literature. Each of the three countries differs in their party system and are in different states of democratic development. Venezuela has experienced prolonged populist leadership under Hugo Chavez and Nicola Maduro. Conversely, Costa Rica adopted a democratic constitution in 1951. Finally, Nicaragua, which restarted democracy in 1990, has recently been reversing these gains. Davis, an English and Political Science and International Relations major will categorize and assess the scholarship on party system development to attempt to determine why these three countries have had varying degrees of success. The researchers hypothesize that success may reside in "good" leadership, structure of electoral systems, economic stability, and ethnic divisions. The goal of this project is to present a paper at the International Studies Association Northeast Annual Conference in 2020.

Victoria Hassan '20 will work with **Kirk Buckman**, Assistant Professor of Political Science and International Studies, on *How Corruption Affects Democratic Development in Chile, Ecuador, and Peru.* This project explores corruption as the main influence on democratic development in Chile, Ecuador, and Peru. Hassan, a Political Science and International Relations major, will explore various types of corruption, including political, financial, and judicial, while assessing why these countries have had varying degrees of success in reducing corruption and promoting democracy. The researchers hypothesize that a collective identity contributing to a sense of patriotic obligation and emerging independent judiciary presses may be factors in each country's successes and failures. Through their research, they hope to develop an innovative approach to study democratic consolidation.

Taylor Ladue '21 will work with **Kristin Burkholder**, Assistant Professor of Environmental Science, on *Subsurface Property Fields in the GOMROMS Model.* The Gulf of Maine (GOM) is one of the most dynamic and valuable marine ecosystems on our planet. The productivity of the GOM relies on nutrients that enter the region through the Northeast Channel, a deep-water channel that connects it with the Atlantic Ocean. However, questions remain regarding how and when the subsurface nutrients, which are important to photosynthesis production, get to the surface. In this project, Ladue, an environmental science major, and Burkholder will begin to examine these questions utilizing new output from a high-resolution model that emulates the movement of the subsurface nutrients in the real ocean. The study will identify whether the model can accurately recreate the real subsurface conditions in the GOM, including whether the changing nature of the inflows into the GOM through the Northeast Channel are captured. The researchers hope to create a podcast summarizing their work to be shared with the general public and to share their work at the Regional Association for Research on the Gulf of Maine (RARGOM) conference in New England in Fall 2019 and the Ocean Sciences Meeting in San Diego in Spring 2020.

Nicole Balamas '20, Vrushabh Daga '20, Michelle Stracqualursi '20, and **Nicole Teaney '21** will work with **Nicole Cyr,** Assistant Professor of Biology, to continue previous summer research on how biochemical pathways interact in the hypothalamus during obesity. Stracqualursi, a biology and psychology major, will work on her project, *The Role of Sirt1 and mTOR Interaction in Regulating Obesity,* focusing on how changes in the enzyme Sirtuin 1 (Sirt1) and the metabolic sensor mTOR interact and regulate body weight. Balamas, a neuroscience major, will investigate how changes in mTOR signaling and endoplasmic reticulum (ER) stresscasued by obesity and Type II Diabetes regulate body weight in her project, *The Role of Two Major Biochemical Pathways in Obesity.* In her project, *Role of Sirt1 in Remodeling Synapses during Obesity,* Teaney, a neuroscience major, will continue her previous research on how Sirt1 effects hypothalamic synapses and whether or not it is regulated by leptin and insulin. Daga's project, *The Effect of Free-Fatty Acids on Appetite-Regulating Neurons,* will focus on the affect proopiomelanocortin (POMC) has on body weight. Specifically, the neuroscience major will look at how POMC neurons react when exposed to high levels of long-chain saturated fatty acids. The group hopes to present their findings at a Northeast Undergraduate/Graduate Research Organization for Neuroscience (NEURON) conference next year.

Joseph Annand '21 will work with **Deno Del Sesto**, Assistant Professor of Chemistry, on *Computational Analysis of Gas-Surface Reactions.* "Syngas" a 3:1 mixture of hydrogen and carbon monoxide, is a product of the reaction between methane and steam over a nickel surface catalyst and involves the cleavage of the C-H bond. This project seeks to understand the mechanism for this cleavage, which could lead to the development of cheaper production of hydrogen gas, which can be used in fuel cells. The team will modify current commonly used computational methods and apply them to specific gas-surface reactions, to study how energy flow within a system relates to experimental results. Annand, a chemistry major, hopes to present the findings with Del Sesto at the national meeting for the American Chemical Society (ACS) in the spring of 2020.

Rama Aldakhlallah '20, Rachel Herwerth '20, and Dylan Sheedy '21 will work with **Marilena Hall**, Professor of Chemistry, on *Investigation of Mutations and Propagation Rates in the M13mp Phage Series* and C*onstruction of a More Virulent M13 Bacteriophage-Based Cloning Vector.* During past summers, researchers in Hall's lab have used bacteriophages to investigate how genetic alterations affect the overall health of an organism. This summer, Aldakhlallah, a biochemistry major, will continue analyzing phage variants through genome sequencing and propagation rates. She will also serve as lab leader and a mentor to the other students. Herwerth and Sheedy, both biochemistry majors, will work to create a new phage containing a large DNA insert in a newer location to see if the propagation speed can be maintained. They will also use an M13-based bacteriophage to peptides to see if they bind to targets such as proteins or cell receptors. Binding peptide targets have various uses such as detection of infectious diseases. They plan to use their findings in the drafting of a manuscript and their senior theses.

Jordan Callahan '20 will work with **Robert Harbert**, Assistant Professor of Biology, on *Monitoring Biodiversity from Aquatic Environmental DNA.* Free, or environmental, DNA (eDNA) are trace molecules found in soil and water. Recent advancements in DNA sequencing technology and expansive databases of DNA sequence data make it possible to detect species present in an environment based on eDNA. This project aims to detect wetland plant diversity on the Stonehill College campus through eDNA analysis. Callahan, a biology major, and Harbert will sequence aquatic eDNA collected from water samples in the seasonal wetland behind O'Hara Hall and the Ames Pond. Information will then be compared to botanical surveys of nearby plant communities to identify possible sources of plant eDNA in these environments. A poster depicting the results of the study will be submitted to the 2019 Student Conference in Conservation Science held at the American Museum of Natural History in New York City.

Patrick O'Shea '21 will work with **Robert Harbert**, Assistant Professor of Biology, on *Applied Machine Learning for Anomaly Detection and Bias Reduction in Species Distribution Models.* Successfully predicting the impact of climate change on global patterns of biodiversity is critically dependent upon the successful modeling of species distributions both now and under potential climate change scenarios. However, current data used to perform this type of modeling consists of incomplete, and often spatially biased, natural history collections and citizen science projects. This project will build and test a suite of anomaly detection and bias reduction strategies using modern machine learning techniques and novel strategies. O'Shea, a computer engineering and biology double-major, and Harbert aim to automate, as much as possible, the detection and correction of bias present in primary biodiversity data. Results from this study will be submitted as a poster presentation to the 2019 Student Conference in Conservation Science held each fall at the American Museum of Natural History in New York City.

Kendall Hawkom '21 will work with **Katharine Harris**, Assistant Professor of Chemistry and Health Science, on *Optimizations in Polyglutamine Peptide Synthesis and Purification.* This project will continue research conducted during previous summers focusing on the aggregation of polyglutamine peptides. Previous studies have found that some neurological disorders are correlated with PolyQ repeats. Through synthesizing, purifying and characterizing peptides, Hawkom, a biochemistry major, and Harris hope to gain a better understanding of the aggregation of the peptides. Project outcomes include Hawkom becoming familiar with the specific operation of the Chemistry Department's Waters UPLC-MS instrument and culminating in a senior thesis project.

Meghan Miracle '22 will work with **Lindsay Hinkle,** Visiting Assistant Professor of Chemistry, on *Crystalline Transition Metal Sensors for the Detection of Oxygen.* Quantitative determination of oxygen is a desirable tool in many fields. One of the most common methods for detecting oxygen, through electrical measurements, is problematic as it results in the consumption of oxygen from the environment. This project hopes to develop light-emitting transition metal compounds that detect oxygen through emission quenching. Miracle, a chemistry major, will attempt to obtain crystalline materials with large channels of open space, through which the oxygen can enter the solid material and interact with the metal compounds. The researchers hope to present their findings at a regional conference.

Stephanie Bryson '20 and **Joshua Litterio '21** will work with **Louis Liotta,** Professor of Chemistry, on various synthesis projects. Over a period of several years, Liotta's research groups have developed ways in which to convert sugars into medicinally interesting sugar analogs known as iminosugars. During this summer, his group hopes to expand synthetic methodologies to include more highly hydroxylated polyhydroxylated indolizidines. Bryson, a biochemistry major, and Litterio a chemistry major, will all be responsible for synthesizing, purifying and characterizing specific iminosugars known as tetrahydroxylated indolizidines. The group hopes to publish their findings in the Journal of Organic Chemistry and/or present at an upcoming American Chemical Society (ACS) conference.

Sophia Guerrera '21, Alex Joseph '21 and McKenzie Woerner '21 will work with **Pam Lombardi,** Assistant Professor of Chemistry, on various chiral ligand projects. Molecules are said to be chiral if they have a non-superimposable image. Reactions to produce these molecules often result in two mirror images, or enantiomers, which can be problematic if the biological activity of one is different from the other. In her project, *Development of a New Route to Chiral Bi- and Tridentate Ligands for Catalysis,* Guerrera, a biochemistry major, will attempt to synthesize N- Heterocyclic carbenes, looking at differences in *N*-substitution of the nucleophiles to assess efficiency. Joseph's project, S*ynthesis of New Chiral N-Heterocyclic Carbene Ligands for Catalysis,* will optimize the synthesis of a new ligand and will analyze the reaction rate in comparison with other N-Heterocyclic Carbene (NHC) ligands. The biochemistry major will use chromatography to assess reaction selectivity and guide potential modifications to the ligand. Woerner, a chemistry major, will investigate triamines then synthesize an iron and an aluminum complex and will characterize the complexes to determine overall structure. Her project, *Investigation of a New Class of Chiral Triamine Ligand,* will examine the catalytic properties of the ligands to determine reactivity, structure and selectivity. The researchers hope to present their findings at an American Chemical Society (ACS) meeting.

Zak Michaud '21 and Acadia Kopec '21 will work with **Greg Maniero**, Associate Professor of Biology, on *Characterization of Amphibian CD4 as a Receptor for IL-16.* The amphibian immune system is nearly identical to that of humans and makes for a well-accepted model in comparative immunology. The immune system produces antibodies that recognize and neutralize very specific pathogens including bacteria, viruses, and fungus. Antibody production requires helper T cells that express a molecule known as CD4 on their cell surface. CD4 has not been well characterized in the African clawed frog, *Xenopus laevis.* Michaud, a biology major, Kopec, a biochemistry major, hope to identify the CD4 cells by attempting to bind, a substance secreted by human immune system cells, to *Xenapus* CD4 cells. If present, they can then characterize the amphibian helper T cells. The researchers will submit their findings to *The Journal of Immunology* or to *Developmental and Comparative Immunology*.

Matthew Gosselin '21 will work with **Greg Maniero**, Associate Professor of Biology, on *Characterizing Invertebrate Populations and Fish Parasites in Ames Pond.* Acanthocephalans, or tiny spiny-headed worms, can be found in fresh and salt water fish. Only one species, *Acanthocephalanus jacksoni,* has been described in New England. The goal of this study is to find, identify, and describe Acanthocephalans in, or around, the waters of Stonehill College. Gosselin, a biology major, will also characterize the zooplankton populations of the pond, thus learning about the fish parasitology, invertebrate biology and community ecology of the campus waters. The results will be presented in a poster.

Abigail Hassler '20 will work with **John McCoy,** Professor of Psychology, on *Cortical Oscillations and Attention.* Attention deficits are a main feature of many neurodegenerative and neuropsychiatric diseases, such as Alzheimer's and Parkinson's disease. The basal forebrain (BF) region of the brain is involved in attention, and the loss of BF neurons is an early feature some neurological disorders. BF neurons that are cholinergic are important to attention, and thus the deterioration of them leads to attention deficits. However, little is known regarding the role of non-cholinergic BF neurons in cognition. In this project, Hassler, a neuroscience major, will look at non-cholinergic subtype, basal forebrain parvalbumin neurons (BF-PV) to see if they mediate levels of alertness for optimal use of attention. The study results will be submitted for publication in peer-reviewed scientific journals and may be presented at a Northeast Undergraduate/Graduate Research Organization for Neuroscience (NEURON) or other regional conference.

Savannah Lopes '21 will work with **John McCoy,** Professor of Psychology, on *Sleep Spindles and Motor Memory.* Abnormal sleep leads to impaired cognitive performance in healthy humans and those with neuropsychiatric conditions, including schizophrenia. Specifically, sleep spindles, 8-15 HZ waxing and waning pattern of oscillatory brain activity observed during sleep, have been associated with memory consolidation. This project will investigate how sleep spindles and their coordination with other brain oscillations during sleep are involved in motor memory consolidation in mouse models, with a special focus on brain areas including the thalamic reticular nucleus (TRN) and the motor cortex. Lopes, a neuroscience major, and McCoy will investigate whether the abnormalities in TRN alter spindle activity and impair motor memory consolidation and if enhancing brain activities with optogenetics improves memory consolidation. The researchers hope to present their findings at the regional Northeast Undergraduate/Graduate Research Organization for Neuroscience (NEURON) conference.

Leana Radzik '20 will work with **John McCoy,** Professor of Psychology, on *Modeling Human Psychiatric Disorders.* Cognitive deficits are a major determinant of the long-term disability associated with severe neuropsychiatric disorders, including schizophrenia. Abnormalities in patterns of cortical oscillations are associated with elevated spontaneous high frequency activity and reduced task-evoked high frequency activity. We intend to examine the biological underpinnings of these abnormal oscillations, using a combination of neuroanatomical and neurophysiological techniques. Specifically, we will evaluate both direct and indirect projections from the basal forebrain to the cerebral cortex, and their role in regulating the balance between the excitatory and inhibitory inputs controlling these cortical oscillations. The researcher will present their findings at the regional Northeast Undergraduate/Graduate Research Organization for Neuroscience (NEURON) conference, and the results may be submitted for publication in a peer-reviewed journal.

Alexia Zambarano '21 will work with **John McCoy,** Professor of Psychology, on C*ircuitry and Connections between the Basal Forebrain and the Thalamus.* Sleep deprivation leads to excessive sleepiness, emotional difficulties, poor job performance, increased risk for several physical and mental ailments and a lowering of perception of the quality of life. The goal of this study is to identify the neural substrates underlying the homeostatic sleep response, which is the enhanced drive to obtain sleep following prolonged sleep deprivation. Focusing on the basal forebrain (BF), Zambarano, a neuroscience major, will utilize optogenetic stimulation to manipulate each subtype of BF neurons. An understanding of the role of each subtype of neuron in the BF and each neurotransmitter, will allow for an understanding of the big picture of how the brain regulates sleep homeostasis. In turn, this will allow investigators to identify cellular and receptor targets to treat excessive sleepiness, and related disorders. The researchers will present their findings at the regional Northeast Undergraduate/Graduate Research Organization for Neuroscience (NEURON) conference, and potentially submit their findings for publication in a scientific journal.

Samantha Curtin '21 and **Jessica Vining '20** work with **Edward McGushin**, Professor of Philosophy, on *Michel Foucault's (1926-184) Unwritten History of Dreams, Dreaming, and Dream Interpretation.* Michel Foucault was one of the most influential philosophers of the twentieth century. In this project, the team will look at his discussion of the role of dream interpretation in philosophy and at the inception of psychoanalytic theory. While there has been an extraordinary amount of work devoted to, as well as in the style of Foucault, there has been no comprehensive commentary on Foucault's writings on dreams. The goal is to fill this gap and produce an article for publication in a scholarly journal. In this project, Vining, a psychology and philosophy major, and Curtin, a philosophy and economics major, will help provide a commentary on Foucault's writings on dreams and dreaming. The group hopes to present their findings in an undergraduate journal of philosophy or at a regional conference.

Rachael Feldhausen '20 will work with **Anwar Mhajne**, a Teaching Fellow in Political Science, on *Becoming Governing Bodies: Political Opportunities and Strategic Choices of the Muslim Sisterhood in Egypt*. During the different social and political transitions in Egypt between 2011 and 2014, the Muslim Sisters were actively involved in the resistance movement throughout, taking a larger role within the organization when members of the Muslim Brotherhood were imprisoned following the military coup. This project based on Mhajne's dissertation will look at how political opportunity structures (POS) shape Islamist women's political participation and conversely, how POS are shaped by Islamist women's political organizing and framing strategies. Mhajne's book will focus on the Muslim Sisterhood's activism, addressing the lack of research on Islamic women generally in POS literature, gender studies literature, and right-wing women's literature. Feldhausen, a Political Science and International Relations major, will work with Mhajne on transcribing and analyzing interviews. The end result of this project is the publication of the book.

Meghan Curran '20 and **Natalie Schafer '21** will work with **Daniel Rogers**, Assistant Professor of Chemistry, on *Nitrogen Cycling in Oyster Aquaculture Systems.* The project will advance research into oyster aquaculture systems completed during previous summers. The presence of nitrogen in coastal waters is not desirable however; removal of it by sewer or other methods is very expensive. The researchers will continue to investigate if shellfish aquaculture potentially alters the fluxes of carbon and nitrogen to underlying sediments, if using shellfish for nitrogen remediation is a viable alternative to sewers and which oyster aquaculture systems offer the most promise. Schafer, an environmental science major and data science minor; Curran, a chemistry major; and Rogers will work with the Woods Hole Oceanographic Institution (WHOI) in the town of Falmouth. The researchers propose to install three oyster aquaculture systems in Waquoit bay at three sites that share similar sediment characteristics and hydrographic regime. The student's efforts will be divided into four areas with each of the students taking the lead in one task and helping the other in lab tasks. The researchers will have opportunities to present their work in scientific and public outreach settings.

Molly Scanlan '20 will work with **Laura Thiemann Scales**, Associate Professor of English, on *Spiritualist Performance and the Death of the Author.* Spiritualist mediums often composed and recited lectures and poetry on stage in an effort to convert audiences to spiritualist principles. Scales suggests that since mediums would disavow any authorship while performing these works in the voices of spirits, the idea of authorship in the nineteenth century should be reconsidered. How did mediums use this more ambiguous authority and from where is this authority derived? In this project, Scanlan, an English and philosophy major, will assist with research on a chapter in Scales' book using archival material, first person accounts, and fiction from the antebellum period to examine the interaction of spiritualist mediums with their audiences. Scanlan will produce her own paper based on her research, to be used as a writing sample for graduate school applications and submission to the 2020 Undergraduate Literary Conference.

Meredith Adams '21 and **Alexis Medeiros '21** and will work with **Jennifer Segawa**, Assistant Professor of Biology and Neuroscience, on *The Effect of Bilingualism on the Aphasic Brain.* Over 25% of U.S. stroke survivors suffer from aphasia-disordered speech production and perception of language. One way that the brain recovers is through neuroplasticity: reorganizing and making may recover more quickly. In this study, Mederios, a neuroscience major, Adams, a psychology major and speech pathology minor, and Segawa will research if speaking more than one language affects recovery from aphasia and how much stroke affects language switching. The research will involve working with stroke survivors, as well as healthy participants. This research is a continuation of research done last summer with the addition of new languages studied including Haitian Creole, Portuguese, and Chinese.

Kaitlyn Corey '20 will work with **Jennifer Segawa**, Assistant Professor of Biology and Neuroscience, on *Examining the 'Glass Cliff': Behavioral, Psychological, and Neural Effects of Stress on Risk-taking Behavior in Men and Women.* The 'glass cliff' phenomena refers to the increased likelihood that women or minorities will achieve leadership roles in times of corporate turmoil, when the likelihood of failure is at its greatest. Stress has been shown to interfere with decision making processes and manifests differently in men and women. In this study, Corey, a neuroscience major, and Segawa will research if there are differences in the decision-making processes of men and women under stress, as well as if behavioral, physiological, and neural responses to stress in these populations. This study will use 20 master's students- 10 men and 10 women- from the Leo Meehan School of Business at Stonehill.

Olivia Gionet '21 will work with **Jennifer Segawa**, Assistant Professor of Biology and Neuroscience, on *Exploring Inequality: Gender Stereotype Threat in STEM and Humanities in the Classroom.* Women have faced a long history of inequality in both the classroom and the job market, and this imbalance more prevalent in the STEM fields. There has been little research as to how gender stereotype threats affect the performance of both STEM tasks and humanities tasks in men and women. In this project Gionet, a biology and secondary education double major, and Segawa will replicate the gender threat stereotype effects in STEM-related testing in school-aged children. Subjects will be asked to complete common mental rotation task after being told a) boys are better at the task, b) girls are better at the task, or c) being given a gender-neutral prompt. The researchers will also investigate if there are gender differences in humanities-based testing. If differences occur, the researchers will evaluate their significance in the fields of gender studies and education. This study will serve as a pilot for a larger study that will continue into the following academic year.

Keelan Hynes '20, Renee Radavich '20, and **Jadaiya Stanley '20** will work with **Anamika Twyman-Ghoshal**, Associate Professor of Criminology, on the *Contemporary Maritime Piracy Database Extension Project.* Twyman-Ghoshal's Contemporary Maritime Piracy Database (CMPD), combines data from multiple sources, providing for one of the most comprehensive assessments of the nature and trends of modern piracy between 1991 and 2010. This project will continue preparatory work done last summer with the aim of expanding the database to include eight additional years. In this project, Radavich, a criminology and political science double major; Stanley, a criminology major; Hynes, a criminology and Spanish double major; and Twyman-Ghoshal will code all piracy attacks that occurred between 2011-2018. The researchers hope to present their findings at a regional conference. In addition to this, the information gathered will be featured in Professor Twyman-Ghoshal's book on contemporary maritime piracy.

Molly Parent '20 will work with **Anamika Twyman-Ghoshal**, Associate Professor of Criminology, on the *Analysis of Somali Maritime Piracy Legal Cases.* Somali piracy attacks increased dramatically in number between 2007 and 2012. The objective of most of those attacks was to hold vessels for ransom which differed from other piracy attacks around the world. In this SURE project, Parent, a sociology and criminology double major, and Twyman-Ghoshal, will conduct a content analysis of court decision of prosecuted maritime piracy cases from various jurisdiction. To do this an analysis framework will be created which will be used to identify common themes in the court decisions. The researchers plan to present their findings at a regional criminal justice conference during the 2019-2020 academic year. Research will also be used in Professor Twyman-Ghoshal's book on contemporary maritime piracy.