The Undergraduate Research Symposium
Provides undergraduates with the opportunity to present the results of their projects of research, creativity and scholarship in a public forum.
Acknowledgments

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ODU Faculty of Undergraduate Scholars
Who have dedicated their time and expertise to mentoring.

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Dr. Elliot Jones and the Art Department

Dr. Austin Agho, Provost & Vice President for Academic Affairs

Dr. Morris Foster and the ODU Office of Research
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| 12:30 – 1:30 PM Lunch in Broderick Dining Commons |

This program is available online through ODU Digital Commons, the university’s institutional repository: [https://digitalcommons.odu.edu/undergradsymposium/](https://digitalcommons.odu.edu/undergradsymposium/) Students are encouraged to submit their final presentations, posters, and artwork to the repository. Contact Karen Vaughan kvaughan@odu.edu for more information about how to submit.
ART EXHIBIT
8:00 AM – 12:30 PM (Learning Commons, Art Gallery)
Chair: Elliott C. Jones, Art Department

Artist Statements

Leigh Anderson
Fine Arts Concentration
Choking on the intrusive thoughts of the voices in your head while your mind is racing through the best ideas you’ve ever had while bricks crumble around you as you try to climb out of the pit feeling like a “lightbulb in a world full of moths,” as said by Carrie Fisher. This is my life with Bipolar Schizophrenia. My art started as a need for catharsis until I realized that it’s not about me. It’s about the conversation of stigma and the epidemic of ignoring mental health issues. It’s frightening, it’s exciting, it’s relaxed and anxious, it’s real and it’s raw and it’s my life. Mental illness is seen as just that, an illness. While it can be cumbersome and unrelenting, mental illness can be celebrated because of its ways of making us feel such intensity that we lead richer lives. I like to use imagery that delivers a raw vision for the viewer to realize how this can feel and what it can look like. Things like pill bottles and evidence of self-harm are obvious; weight gain, a loss or confusion of identity, and the silent struggle to simply exist are not. This is why the conversation is so important. Mental illness can hide in plain sight or be glaringly obvious. Either way, it should not be ignored. Most of my work is made through the printmaking process. The repetition, the constant inundation of images, and the quiet reflection of each work are what help me discover myself in my art. I throw out everything I’m feeling onto the matrix and let the process heal me. Reproducing these images in a series also allows me to distribute my work to those who may be feeling the same, to show solidarity, to show hope.

Jaquay Atkins (Mentor: Ivanete Blanco)
Colorism
African American Studies Concentration
Colorism is a persistent problem that plagues the black community from within. Colorism is defined as the tendency to attribute light-skin people with positive virtues and dark-skin people with negative ones. I am extremely passionate about this issue because it is something that I have lived through as well as witnessed up close and personal. I have seen how discriminatory remarks can damage a person’s psyche and cause their self-esteem to plummet to all-time lows. I wanted to bring attention to an issue that often goes unnoticed. What you see before you: a magazine with personal testimonies, statistics, and cold hard facts regarding colorism and the effect it has on people. For this publication, I accumulated hours of research to bring credibility to my argument. My words would not be enough, so I sought out to hear the words of others. I conducted interviews with African Americans who have experienced colorist behavior. Through talking to them, I gained a new perspective on resiliency. It takes tremendous courage and strength to persevere through those adverse conditions. What started off as a simple poster, blossomed into an entire campaign. I designed shirts, organized photoshoots, designed the magazine from cover to cover, and passed out flyers. A strenuous process but the main goal was accomplished. I am excited to share my artwork with the world. The main goal is to spark the conversation about an uncomfortable topic.
Icarus Bonner (Mentor: Kenneth Fitzgerald)
Illustration Concentration

The Pearl of Life is a short children’s book written and illustrated by me. The story features a young witch named Sophie who goes on an adventure to find the Pearl of Life which will rejuvenate the dying land of her village. I felt urged to create this book because I have a desire to see more stories about black people that are fun fantasy stories for all ages. While things are improving with media--such as Spider-Man: Into the Spider-Verse, Black Panther, and Cannon Busters among others--these kinds of stories are in the minority. An overwhelming amount of media with a black lead or black cast are centered around historical drama, slavery, gangs, poverty, and the repeating themes of ‘Black struggle stories.’ While some may argue any representation is good, it’s important to think about how the representation affects the minds of black children: seeing black people constantly in chains, shot and killed, or unimportant characters consigned to the background. This is why my story features black characters who are not written with these struggles infused into their very being. I also decided to focus the story on a female lead because, out of the stories that do exist featured black people, black women are even less likely to have their own narrative. I want a change, and I am taking the initiative to be that change. Inspired by the art style and atmosphere of Studio Ghibli movies and the work of Yoh Yoshinari (particularly his work on Little Witch Academia), I sought to create a world that had a whimsical sense of adventure, a world where there may be danger, but you know everything must turn out alright in the end. I initially sketched out every page on paper, going over the thumbnail and rough sketch process many times. Afterwards I completed the pages digitally, and I printed and bound my first book by hand. The book presented here was printed by a manufacturer after editing. I have received a lot of interest and excitement about the story, so I encouraged to make more books and more worlds. My goal: that anyone can read this story and enjoy it, as it is meant to be fun. For me, it’s incredibly important that some things exist in this world just to be healing, just to be enjoyed. I am very happy that others can derive joy from things I have created with my own mind and hands.

Evan Bowers (Mentor: John Roth)
Fine Arts Concentration

My work is dedicated to applying a mechanical design perspective to traditional art silhouettes. Coming from a mechanical engineering background, I have a fascination with both mechanics and design that I use to explore the realm of immaterial human concepts such as love, war, greed, and religion. And in true engineering fashion, I bring these conceptual things into the material plane. I strive to create prototypes that are interpretations of what it is to be human using my skills in various fabrication methods. I want to show the world a perspective seldom seen in the art world as I am someone coming into this world of color and abstraction from a world that is as structured and calculated as any engineering stereotype would attempt to capture. My use of materials depends on the application and need. I use materials that become an expression of the design. I avoid fine materials—preferring cheaper construction grade materials that focus our attention on their manufacture. In fact, many materials I choose to use have the manufacturer’s marks printed on them, marks which I choose not to refine away. In my eyes, these markings are as much a part of the material’s character as grain is to wood. I draw influence both from the mechanical aspects and the existential aspects of various sources. I am mechanically inspired by works of Theo Jansen and Virgil Abloh, both successful artists with a background in science. I find world events based on political and cultural strife to be fascinating and helpful in my internal excavation into what is it to be human. I proudly exclaim that it is my grandmother Tommie Williams, a watercolor artist
from Mississippi, who made me into the man who now wishes to walk the worlds of art and science.

**Stephanie Buckley** (Mentor: John Roth)

*Up and Away*

**The Viewing Box**

**Sculpture Concentration**

*Up and Away* is an abstract metal assemblage sculpture. Repurposing and upcycling discarded steel, brass, and other found metal objects in a visually interesting and artful way was a challenge. I believe being good stewards of our environment means upcycling and repurposing things whenever possible. For this project, I repurposed a frying pan, metal wine bottle stoppers, brass candle holders, steel rods, and sheet metal to give this sculpture texture, color, and shape. To assemble the metal pieces together, welding, spot welding, and wing nuts were used. This interactive sculpture swivels on a re-purposed metal lazy Susan. Spray painting the steel rods, brass, and wing nuts red adds a pop of color. I hope *Up and Away* challenges what people think about discarded items and how it relates to art in their environment. *Up and Away* was created in the ARTS 261 Introduction to Sculpture, Spring 2019 semester.

*The Viewing Box* is a wooden handheld box to view 35mm art history slides. After finding a large trash bag full of art history slides, I wanted to enjoy viewing the slides without spending a lot of money on a projector. I was inspired by the view master and movie viewer toys from my childhood. The box was constructed using finger joints, a clear lens, and repurposed coat rack. It's painted and mod podged with images and text to give it a distressed antique finish. The slides are held in a wooded holder for easy viewing. *The Viewing Box* was created in the ARTS 429 Wood Studio/Furniture Design, Summer 2019 semester.

**Kim Hardy** (Mentor: Elliott Jones)

*Po at 14 years. 2 Months, 29 Days*

**Fine Arts Concentration**

My work of paintings and drawings shares an honest and sensitive portrayal of the human form in an effort to honor how life wears a body. I render similar body parts from family members at different stages of life to reflect the metamorphosis we undergo with time. The impact of time and age manifests itself within my own family. On one hand, I have two adolescent children, whose bodies are in flux as they mature through puberty. They are perfectly plump, flexible, free of scars and signs of wear. On the other, my parents’ bodies continually bend with the weight of time. My dad hobble on two new knees; my mother’s joints, stiff from arthritis, rise against her thinning skin. At middle age, I dwell somewhere in-between them, in a place where my muscles still harbor youthful strength but persistently ache. Contemplating the bodies of those I love, I feel both nostalgia for my childhood body that could bend and twist and move so freely, and unease for what lies ahead. When I hold my daughter’s fleshy hand, I am reminded of when mine resembled hers. Now, in my own hands I recognize my mother’s rising veins that I once traced as a child. As I study my mom’s aged fingers, I notice a fragility in them; the plumpness has vanished, exposing the pathways of her bones. Seeking to express sentimentality and trepidation about change, I paint with oil on hardboard panels that my father and I built together. I choose oil because of unexpected blending and marks associated with wet-on-wet application. My intent is to embrace the inevitability of aging.
Emily Hughes (Mentor: Elliott Jones)

**Touch Series**

Painting Concentration

*The Touch Series* is an exploration of the power of physical touch. The creation of this series served as a tool for methodical and honest introspection about my feelings toward my closest relationships and myself. I use art making as a means to process my experiences but also to search for connections and communication with others. I want the viewer to be able to sense the relationships and feel the strength of the emotions portrayed in a close view of hands—specifically, the impact touch has on different relationships with other people and with one's own self. In *The Touch Series*, the viewer is able to discern a different emotion and tangible atmosphere attached to the relationship between the hands in each painting. I created this series using a mixture of observed life and photographic references. My process began with taking a photograph of either a loved one’s hands or—most often—my own hands using a timer. I used the photo to capture a specific pose. I then digitally manipulated the colors in the photo to better reflect the selected emotion or relationship. Then I got to work painting and layering shapes and colors all the while using my own hands as a guide. It is my hope that viewers can find an aspect in the work that is meaningful to them and allows them to think about the different connections touch provides.

Connor Fad (Mentor: Elliott Jones)

*The Heart of All* is an elaborate piece has been a passion project for essentially an entire semester as a means of expressing various subject matters encompassing life around us that I find fascinating and various mediums to express this. I feel that tables are where many people contemplate life and have the best conversations with other people, so I felt that expressing what I am passionate about in sculpture would make sense if it were expressed on a carved table. This work contains an anatomically correct human heart in the middle of the piece which is filled with native animals to Virginia, where I have always lived, and they are used as a substitute for arrows to show blood flow. Along the table there are carvings of neurons, adenosine triphosphate, bacteria, viruses, spider webs and bee hives, amniotic eggs, important fossils, and other aspects of biology. I experimented with various carving techniques, such as in the round with the salamander and heart, as well as shallow relief carving in the table top itself. Though all the techniques seem to be unlinked, I thought that would make sense with science in general, so much seems loosely if at all connected, yet it all is even if it is a lose connection. I wanted to show inspirations from many different artists and naturalists in this table, such as Ernst Haeckel’s elaborate prints, Charles Darwin’s notes, Leonardo DaVinci’s notes, as well as some elaborate renaissance wood carvings like those of Tilman Riemenschneider. Biology for me is just as large of an influence as art, and on this table it felt liberating to utilize both aspects with the more artistic liberties than I have had in the past.

Emily Jones (Mentor: Kenneth FitzGerald)

To Those Who Design

Graphic Design Concentration

*To Those Who Design* is a student-led magazine designed for students by students. The magazine showcases eleven designs by students, ranging from freshman to seniors. This magazine came about as a response to a design project to “design something the world needs.” In answer to this question, I thought about what and with whom I interact the most. As a design student, I interact the most with other design students. Although my response to this question isn’t profound, it is not overly ambitious or lofty. Graphic design, however, resonates deeply with me. And I genuinely believe that every student’s work, no matter in what stage of design, has value inasmuch as the
students are creating. Taking inspiration from designers like David Carson, Michael Bierut, and old letterpress booklets, I created the first issue of To Those Who Design. I combined the student-provided designs and the graphics I made to complete the pages of the magazine. Overall, the magazine was well received by those who viewed it in either its online or physical iterations.

**Kerry Kilburn** (Mentor: Brendan Baylor)

*Ghost*
Fine Art Concentration

Who am I? In some cultures, as an older woman I would be the manifestation of the crone face of the triune goddess: the wise woman, the revered elder, the keeper of tribal memory. But in our youth-obsessed patriarchal society I am largely invisible—my knowledge, life experience, and potential contributions discounted or ignored. I am a ghost. Or am I? With “Ghost,” I issue a challenge to the ageism that pervades our society. I claim my space as an older woman, both a keeper and a maker of memory, who faces her future with confidence and serenity, and whose voice remains strong and passionate. I am me. This work is a five-layer laser-cut woodblock print that combines both digital and traditional processes. I derived the images for the woodblocks from digital sources and assembled them into separate layers using Photoshop and Adobe Illustrator. The resulting files were used with a laser cutter to create woodblocks corresponding to each layer. I printed the blocks on top of each other, creating the final image. My objectives for the project were two-fold. First, I wanted to explore the technical process of layered woodblock printing, which was new to me. Second, I wanted to create an image whose symbolism both expresses the general meaning I intended and allows each viewer to find individual interpretations as well.

**Hope Kinard** (Mentor: Elliot Jones)

*Social Religion*
Fine Arts Concentration

Like many people, I have felt the need to interact with all four major social media platforms—Facebook, Twitter, Instagram, and Snapchat—at all times. I started to believe the news people shared on their timelines and thought I could accurately discuss difficult topics. However, the information always turned out to be wrong or incomplete, making me look foolish and easy to attack. Words posted online are now taken as seriously as text printed in the Bible. Influencers are now saints and post their gospel online for others to worship. Centuries ago in Europe, angels were widely used to represent the presence of God or to report his word. Now contemporary social media is comparable to the concept of God as an all-knowing and all-powerful presence watching our interactions and controlling what we see. In this series of angels, I have incorporated hidden iconography that relates to both religion and social media. Charcoal represents these figures in a dramatic lighting that blends values softly. These angels represent social media platforms and through them the presence of the modern God of technology.

**Carle Lockwood** (Mentor: Elliot Jones)

*Marks*
Fine Arts Concentration

The theme executed in this piece is “Body Positivity.” By this I mean lifting others up by showing that there is nothing wrong with being happy about the way that they look, despite their perceived flaws. This is accomplished by capturing something traditionally seen as “bad” or “ugly” by societal standards (in this case, stretch marks) and combining it with the use of calming colors and relaxed body language that leave the viewer with a pleasant feeling. By minimizing the stretch
marks in this piece, they are made less significant and therefore unimportant, thus further propelling the idea of accepting one’s own flaws and the flaws of others. Photography and oil paints were used to accomplish this work. The photography was used for the initial reference images by posing the model, and being sure to capture something that would traditionally be seen as an imperfection or unfavorable feature. The image was then cropped in a way that made the subject ambiguous, allowing viewers to place either themselves or someone they know into the position of the figure. This, combined with the ambiguous background, allows viewers to connect more with the image and reflect. The artistic inspiration for this piece, and the series that came after, was Jenny Saville. Her use of simple backgrounds that force one to engage with the subject, her use of color, and her willingness to have a visual discussion, even if it was a difficult one, were what prompted the creation of the work.

Mia-Myline Medina (Mentor: Greta Pratt)

Melancholic Temperament
Photography Concentration

*Melancholic Temperament* explores the darker and often unexpressed side of human emotions. Anger, loneliness, and social disconnect are key themes incorporated throughout the series. The scenes are highly staged and deadpan in order to expose a suppressed and unnatural tension within ourselves. Influence for this series stems from my childhood. Growing up, I was often left to care for myself because my single mother worked long days in the military. As my family was constantly moving from one location to another, I often felt disconnected from my family and was not equipped mentally to form social connections with my peers. Being alone and not knowing who to talk to or how to express myself, I learned to suppress my darker emotions. In retrospect, this was toxic to my mental health. If I could give my younger self one piece of advice, it would be to communicate with anyone in regard to how I was feeling. This series is intended to create a discussion about the broader range of internalized emotions. Open discussion about taboo topics, such as the ones explored in this series, may aid in diminishing the stigma surrounding them and give those suffering silently a chance to seek help.

Deborah Moses (Mentor: Brendan Baylor)

*Andersen’s The Little Mermaid, as retold by Dee Moses*

Book and Paper and Printmaking Concentration

The fanfic, the fanart, the zines, the romance novels, the fairy tales are things people turn their noses up at in public, but secretly enjoy in private. Even more so, these are the things that are often made and consumed by women, indelibly linked to women by our society, and removed from mainstream success and acknowledgement, specifically because they are associated with women. Men make canon (source narratives) and religion, women make “fanon” (supplements to the canon) and fairy tales. Even though we often dismiss these amateur works out of hand as trash, they contain multitudes of talent, vision, and relevance. Even the Brothers Grimm knew this; that’s why they collected their fairy tales from the best sources – old women who told the stories to their children around the family hearth. I first read Andersen’s “Little Mermaid” when I was 8 – around the time Disney’s version came out. Even then, the story struck me as unnecessarily cruel. All the mermaid wanted to do was get married and have a soul; instead, she is constantly injured, hurt, and humiliated. The moral seems to be “never leave your assigned role in life.” What if, instead, we acknowledge that sometimes we do stupid things for love, but that shouldn’t be the end of the world? What if the things life throws your way sometimes turn out to be better than what you intended in the first place? What if love is actually important? Where Andersen sneered at the Little Mermaid, we can welcome her with open arms and assure her that
life goes on. To this end, I have created a 16-page, full color, hand-bound book of original drawings transferred to paper by laser-cut woodblock prints laid over reduction linocuts. While registration and time constraints were a challenge, I hope you will find the result to be worth the effort.

Jordan Shackelford (Mentor: Elliot Jones)
Black in America
Illustration and Film and Media Concentration

In this piece you see five African American males dressed in suits being confronted by a white male with a gun. Despite the five males being dressed in suits, they are still being judged by the color of their skin. The white male holding the gun feels the need to protect himself when crossing paths with a group of African American males. This scene’s purpose is to place the viewer in the shooter’s perspective. The objective of this piece is to bring attention to black on white shootings, police brutality, and racial profiling.

Eric Smith (Mentor: Elliot Jones)
Father and Child

This series was inspired by the moment I first learned I was soon to become a new father. Overwhelmed with expectant joy, I wanted to paint portraits that depict optimistic images of what fatherhood looks like today. In contrast to the negative images of absent or aloof fathers that we are familiar with, I easily discovered a diverse selection of caring and involved father figures. Each painting of this four-piece series focuses on the individual relationship between father and child by removing the background environment and using color as an element to emphasize the figures. All of the subjects are relaxed and natural, dressed in their everyday attire to capture an honest depiction of their lifestyles and to properly identify the time period. It was meaningful to me to portray fathers of this generation whom I can identify with as positive representations of paternal influences. As I continue this series, I expect to include different elements and to evolve in my handling of the subject matter as my own knowledge and experience of being a father grows.

Chris Valentine (Mentor: Elliot Jones)
The Final Frontier

The Final Frontier is an animated short utilizing screen-printing, laser cut woodblocks, image transfer and good ol’-fashioned American Punk rock. We are currently on the brink of unprecedented space exploration, and I believe it is important that we take care not to repeat any of the many atrocities made in our past colonial exploits. The main character in this piece is extremely careless and self-involved. He comes ripping onto the scene causing destruction and death while claiming it is his destiny to do so. I drew a lot from my experience in the Navy with this project. All over the world the effects of American colonialism can be felt, and it is clear that a giant reason we go to war anywhere, is the acquisition of resources and the sale of armaments. I try to touch on this with the piece. I really like the way printmaking looks in animation. It is a medium not often utilized, and I believe it gives the cartoon an interesting look. As for the anaglyph 3D, it is a simple and antiquated technology that is suggestive of something high-tech. The main character fancies himself a man of the future, but still values life on the level of a feudal lord. I believe the red hat and old school 3D glasses are very telling of his personality. The song is inspired by a lot of stoner rock, namely Fu-Manchu, and Annihilation Time. From the very start with the storyboarding phase, I worked with my partner writing the song. Let it be known now
and for all time that Taylor Vertrees is a rock God. For me the cartoon is as much about the music as the animation, and great care was put into the making of both. This cartoon is completely DIY; the only thing appropriated are the space backgrounds and planets which are images from NASA.
Particle Trajectory Classification and Prediction Using Machine Learning
Angelos Angelopoulos, Polykarpos Thomadakis, Gagik Gavalian, and Nikos Chridochoides (Mentor: Dr. Nikos Chridochoides)

Nuclear, Theory and Algorithms, and Numerical Analysis and Scientific Computing

Nuclear physics is a challenging scientific domain where experiments are often expensive due to the high cost of the machinery involved. Experimental setups record terabytes of data each day and process them to identify interacting particles from information provided by a series of detectors. One of the most important parts of data processing is identifying trajectories of charged particles in wire chambers. This process is computationally expensive and comprises about 94% of computational time. Charged particles are identified by combinatorially considering all possible combinations of segments. In this work, we used machine learning to identify possible valid combinations of track segments to reduce the number of combinatorics to be considered and reduced the computational time by a factor of ~6 times. We developed three different models to address this problem: an extremely randomized trees model, a multi-layer perceptron as well as a convolutional neural network (CNN). The models achieved an overall classification accuracy of 96.5%. To further reduce the search space for classification, we developed a supervised recurrent neural network (RNN) using long short-term memory (LSTM) layers capable of predicting particle trajectories based on previous trajectory information. Because the model is trained on only acceptable trajectories (i.e. broken lines), it will help eliminate many unacceptable trajectories that do not align with its predictions. These machine learning models will be employed in the experimental pipeline for the CLAS12 detector in order to filter incoming data, save 6-8x more time and energy compared to current methods used, and help increase experimental accuracy.

Characterizing the Activity of Antimicrobial Peptides Against the Pathogenic Bacterium Clostridium Difficile in an Anaerobic Environment
Kwincy Alleyne, Mayriam Cotton, David Courson, and Adenrele Oludiran (Mentor: Dr. Erin Purcell)

In our lab we study oxidative stress response of *Clostridiodes difficile* in relation to biofilm formation. Oxidative stress is the imbalance between oxidation and anti-oxidation in the bacterial system. Biofilm are extracellular matrices produced by the bacteria. *C. difficile* forms biofilm one of the phenotypic expression response to oxidative stress. We use peptides and metals as the major source of oxidative stress. Metals like copper and silver which are already known for their antimicrobial effect, showed stimulation of biofilm at sub-inhibitory concentrations while we notice no difference in biofilm formation when exposed to magnesium. Piscidin one of the host defense peptides (HDPs) produced by the innate immune system combats pathogens entering the host body by inducing oxidative stress. The peptide did not show significant biofilm stimulation suggesting that the response of the bacteria to different sources of oxidative stress may vary and this is worthy of more investigations.

Bigfoot Inspires Youth: Leave No Trace in Urban Afterschool Programs
Alex Bitterman, Lora Clanton, Asiah Allen, Eddie Hill and Peter Ahl (Mentor: Dr. Eddie Hill)

Outdoor Education
Currently, youth especially urban youth, are being disconnected from nature (Dawes, Pollack & Sada, 2017; Deutsch, Blyth, Kelley, Tolan & Lerner, 2017). Recent studies show that youth only
spend about 15-25 minutes outdoors recreating (Atchley, Strayer & Atchley, 2012). Youth are now exposed to high-arousing stimuli from social media, video games, and videos on mobile devices (Larson, Szczytko, Bowers, Stephens, Stevenson & Floyd, 2018). Nature-based programs have short-term and long-term effects on youth (Asah, Bengston, Westphal & Gowan, 2018). Youth who are involved in nature-based programming have demonstrated improved test scores, self-discipline (Seltenrich, 2015) and have become more environmentally aware when they mature (Liddicoat & Krasny, 2013). Out of school time (OST) programs can provide an effective setting for nature-based programs. The Leave No Trace for Every Kid educational initiative focuses on educating youth about environmental stewardship based on values and asset development (Leave No Trace for Every Kid, 2019). These values help build youth’s affinity for nature through outdoor camps and OST programs that provide opportunities for youth to spend time in the outdoors and learn skills that can be related to everyday life (What Is Leave No Trace for Every Kid, 2019). Thus, the purpose of this study is to measure the impact of an OST program using the Leave No Trace Bigfoot's Playbook help connect urban youth to the environment.

Investigating the Co-Occurrence of Rickettsia Parkeri and Rickettsia Andeanae in Gulf Coast Tick Populations in Virginia
Arunava Borah, Alexandrea Cook, Asha Dunlap, Josue Espinal, Lulu Elzein, Victoria Gosine, Nykasya Williams, Tim West, Kasey Parker, and Sara Simmons (Mentor: Dr. David Gauthier) Biology

Gulf Coast ticks, Amblyomma maculatum, are the principal vectors of the pathogen Rickettsia parkeri in the southeastern U.S. Rickettsia parkeri, the causative agent of a type of spotted fever rickettsiosis, is an intracellular bacterium that can be transmitted through tick saliva. Presence of a closely-related species, R. andeanae, in Gulf Coast tick populations appears to limit prevalence of R. parkeri. To investigate co-occurrence in ticks, we hypothesized that sites in Virginia with higher R. parkeri prevalence would have lower prevalence of R. andeanae. We tested 232 ticks for collected from five sites in Virginia for R. parkeri and R. andeanae using a real-time PCR assay targeting species-specific sequences of the ompB gene. Overall, 48.7% of 232 ticks were infected with R. parkeri, and only 5% were positive for R. andeanae with R. parkeri infection observed in Virginia Gulf Coast ticks along with few R. andeanae infections conforms to the hypothesis that R. parkeri and R. andeanae rarely co-occur. Further work will expand the geographic area covered to include more sites across the southeastern U.S.

Investigating Daily Stressors Among Lesbian Women
Lauren V. Butler, Jasmine Craig, Charlotte Dawson, and Robin Lewis (Mentor: Dr. Kristin Heron) Clinical and Multicultural Psychology

Sexual minority stressors (SMS; i.e., unique and hostile stressors resulting from identity) commonly occur to sexual minority individuals (e.g., gay, lesbian, or bisexual) due to discrimination and stigma, but research is relatively little on these experiences in daily life. However, not all sexual minority experiences are negative. Previous research investigated positive and negative experiences among sexual minority men and women but studying these experiences among lesbian women specifically and considering how the questions are asked is needed. The purpose of this study was to: (1) report rates of daily positive and negative experiences related to sexual identity in lesbian women, and (2) investigate how reports of daily SMS differ based on how the question was asked. Same-sex female couples (N=321 participants, ages 18-35) were recruited online and completed surveys for 14 days. Each morning participants completed measures of positive and negative events related to being a sexual minority and were asked about specific SMS experiences. Results for Aim 1 reported positive experiences on 18% of days and
negative experiences on 5% of days. Results from Aim 2 showed when questions were asked generally about SMS participants reported experience on 5% of days, but when asked about specific experiences, they reported an SMS on 20% of days. Expanding past research, this study assessed positive and negative daily minority experiences among lesbian women. Experiences differed based on question type, such that there were more negative experiences reported when specific questions were asked. Future research and limitations will be discussed.

Exploring the Family Stress Model (FSM) Among Recently Immigrated Hispanic Parents
Kyla Carr, Isis Cowan, Taylor Webb, and Alan Meca (Mentor: Dr. Alan Meca)
Developmental Psychology
Parents play an important role in shaping children’s behavior by establishing boundaries and correcting inappropriate behavior, while also providing emotional support, protecting the child and providing for the child’s needs (Seay, Freysteinson, & McFarlane, 2014). Acute and chronic stressors can negatively impact parents’ ability to engage in positive parenting practices (Masarik & Conger 2017). Given the stressors associated with immigration and acculturation (Romero & Piña-Watson, 2017), there has been a recent interest in examining how these unique pressures impact parenting and children’s emotional well-being (Lorenzo-Blanco et al., 2016). Acculturative stress includes two dimensions: pressure against acculturation and pressure to acculturate (Kim, Hogge, & Salvisberg 2014). Studies have not yet investigated the unique effects of the individual components of acculturative stress on parenting practices. This study addresses gap by examining how dimensions of acculturative stress predicts positive parenting and parental involvement. The parent sample was drawn from a larger longitudinal study, Construyendo Oportunidades Para los Adolescentes Latinos (Schwartz et al., 2014), with recently immigrated parent-adolescent dyads residing in Los Angeles and Miami. The sample consisted of 302 recently immigrated Hispanic caregivers (Mage = 41.09, SD = 7.09; Mother = 69%). Miami families were primarily from Cuba (61%) whereas Los Angeles families were primarily from Mexico (70%). A path model was estimated in Mplus V8. (Muthén & Muthén, 1998-2017) using a Robust Maximum Likelihood Estimator to examine the unique effects of parents’ acculturative stress at Time 1 on Positive Parenting Behavior and Parental Involvement at Time 2, controlling for baseline levels. The model had good fit [χ²(2) = .403, p = .817, CFI = 1.000; RMSEA. Indeed, as children gravitate toward the receiving culture (Schwartz et al., 2010), caregivers may exert more parental control (Halgunseth et al., 2006), which may be construed as “positive parenting.” Future research should examine both the origin of these stressors and take into accounts’ youths own report of family functioning.

Chemical Kinetics of the Mechanochemical Synthesis of Tetrathiafulvalene Chloranil
Richard Chen and Kerem Gokus (Mentor: Dr. Silvina Pagola)
Materials Chemistry
A large variety of materials can be prepared from powdered reactants by solid-state grinding and mechanochemistry, avoiding or largely reducing the use of reaction solvents, so offering alternative “green chemistry” synthetic routes. However, the mechanisms of such reactions are poorly understood, and their properties have only recently started to be unraveled. As part of a 2019 PURS project, our group studied the chemical kinetics of the mechanochemical synthesis of tetrathiafulvalene chloranil (green polymorph), a charge transfer complex with ionicity around 0.3e-. The electron transfer reaction between tetrathiafulvalene (electron donor) and chloranil (electron acceptor) was carried out by manually grinding stoichiometric quantities of the reactants in 1:1 molar ratio under isothermal conditions. The fraction of product obtained was monitored by quantitative phase analysis from laboratory X-ray powder diffraction using the internal standard method. Current results indicate a reaction order solid-state mechanism and a
second-order rate law for the neat mechanochemical synthesis. An increased rate constant is observed for the same reaction by liquid-assisted grinding using diethyl ether as a liquid additive.

**Synthesis, Characterization, and in vitro Studies of Vandium-Containing Complexes for Treatment of Breast Cancer**

Jasmine Clark, Jennie Williams, Stephen Beebe, and Michael Celestine (Mentor: Dr. Alvin Holder)

*Inorganic Chemistry*

African American (AA) women have a significantly higher incidence and mortality from triple-negative breast cancer (TNBC) than any other racial group. The development of TNBC among Africa and Caribbean black women is 8-46% lower than among US AA women, suggesting an inherent difference in AA women and the need for non-hormone-based standard of care (SOC) chemotherapeutic agents. Vanadium-containing compounds are currently studied for their anti-cancer efficacy in many cancer types. We hypothesize that vanadium-containing complexes are more efficacious anti-cancer agents than the SOC treatment in all TNBC groups. 

\[ K[VO(O_2)\text{phen}]*3\text{H}_2\text{O} \]
\[ [\text{VO(sal-L-tryp)}] \]
\[ [\text{VO(sal-L-tryp)}(\text{phen})]*\text{H}_2\text{O} \]

were synthesized and characterized via FTIR and UV-visible spectroscopies. The efficacy of the vanadium-containing complexes was assessed by the MTT viability assay using the AA TNBC cell line, HCC70. The IC\(_{50}\) values were 69.0 µM, 43.2 µM, and 38.6 µM for complexes 1, 2, and 3, respectively. The IC\(_{50}\) values were 31.2 µM, 4.7 µM, and 6.12 µM for the complexes, respectively. These results demonstrated that these complexes decreased the growth of HCC70 cells in vitro and were more efficacious than previously determined SOC agents. IC\(_{50}\) values obtained on A431 and HFF cell lines were 40.1 µM and 80.2 µM, respectively. Ongoing studies involve anti-cancer potencies of these complexes on HCC1937 and the MDA-MB-231 VIM RFP TNBC cell lines relative to the SOC. In conclusion, these complexes show significant promise to inhibit breast cancer growth and may serve as a SOC for TNBC.

**Work Influences on Intent to Leave Academia**

Alba Couturier (Mentor: Dr. Miguel A. Padilla)

*Health Psychology*

The intent to leave academia is not a topic often addressed in research. Working in academia is a very stressful and demanding job. Between peer pressure, burnout and mental health difficulties, there is an increase in faculty’s intention to leave the academic workplace. This study examines the impact of job-related characteristics and mental health on faculty’s intention to leave academia. For this research, academic individuals were recruited via email and asked to complete a survey. A multiple regression was run to predict intent to leave academia. The predictors for this analysis were organization support, peer support, peer pressure, job satisfaction, burnout, and mental health. The findings indicate that the predictors statistically predicted intent to leave academia. Therefore, poor mental health, job resources as well as high level of burnout and pressure predict individuals’ intent to leave academia.

**Assessing High-Impact Practices: The Role of Triple Loop Learning in Fostering Future Conservation Leaders**

Anthony DeSocio (Mentor: Dr. Eddie Hill)

*Educational Methods*

Over the past two decades, higher education institutions have codified practices that increase the attainment of outcomes associated with a holistic college education and the preparation of students for the 21st century workforce (Beitman, Gahimer & Staples, 2015). Institutions regularly
focus on providing opportunities for students to contribute to their communities through civic engagement or service-learning, known as “High-impact practices”, creating added value and augmenting traditional classroom curriculum (Campus Compact, 2016; Goff, Bower & Hill, 2014). The triple loop learning model outlines three feedback loops of learning that underpin how students can assess their actions and mental models. This model proposes that most actors in collaborative conservation planning are unaware of how their individual mental models effect collaborative decision-making (Biggs et al., 2011). In this study, we explored student learning facilitated through HIPs – research, service-learning and internships – facilitated through interdisciplinary, conservation leadership coursework provided by a public institution in the southeastern U.S. Student learning was explored from participation in the Conservation Leadership minor. Specifically, we were curious whether HIP experiences within a classroom setting, service learning field work, and U. S. Fish and Wildlife Service internships throughout the southeastern U.S. aided in students “triple loop learning” (Biggs et al., 2011). Results of this study show the Conservation Leadership minor achieves its goal of providing multiple learning pathways for budding conservationists, but could be enhanced through additional stakeholder outreach, training, and engagement.

Elmwood Cemetery Tour Visitor Satisfaction Survey
Anthony DeSocio, Coleen Doyle, Jessica Sopko, and Taylor McIntosh (Mentor: Dr. Eddie Hill)

Recreation, Parks and Tourism Administration

The Norfolk Society for Cemetery Conservation’s cemetery tour program is a major component of Norfolk’s Department of Recreation, Parks, and Open Space effort to maintain the many historic cemeteries within the city. Evaluation of this event is necessary to ensure participants are receiving relevant information regarding the cemeteries and enjoying the programming. On October 25th, 2019, student researchers visited the History, Mystery, Murder, and Mayhem Cemetery Tour to observe and administer surveys to participants. Casual observation revealed some difficulties in regards to tour guide volume and navigating the paths of the cemetery. Conversely, results indicate that respondents were overall very pleased with the tour length, information, and quality. Respondents stated the most enjoyable aspect of the tour was the actor portrayals of cemetery guests and many stated they would enjoy seeing more of this content. Overall recommendations include increasing the actor portrayal content, while maintaining the current length, possible multiple shorter session as opposed to fewer longer ones and finding better solutions for tour guide volume. However, survey respondents are pleased with the current state of the tour and drastic changes to format are not recommended.

Meeting the Water Needs of the People of Puerto Rico While Safeguarding Freshwater Ecosystems: A Case Study
Anthony DeSocio, Lexi Watson, Amanda De Vleeschower, Eddie Hill, Tatyana Lobova, and Hans-Peter Plag (Mentor: Dr. Eddie Hill)

Environmental and Fresh Water Studies

The interconnected nature of the geography, history, culture and politics of Puerto Rico has created a water management crisis on the island. Addressing this crisis poses a wicked problem that involves multiple stakeholders and regulatory bodies and thus, cannot be easily solved. The water management crisis in Puerto Rico is currently exacerbated by climate change through instances of prolonged drought, variable precipitation, and increased frequency and intensity of storms, and this trend is expected to continue over the next several decades and beyond. Moreover, sea level rise threatens to completely displace coastal communities and cause ecosystems to migrate inland or become altogether eliminated. This case study seeks to
understand the water management crisis in Puerto Rico in a systems thinking perspective with a participatory modeling exercise, which examines the problem through the lenses of the invested stakeholders. In this way, the stocks and flows within the human and environmental systems were conceptually mapped by seven participants, the hazards and vulnerabilities were identified and weighed, and a range of likely futures that utilizes the latest in data science were postulated. After a thorough review of these variables, the participatory approach to interventions was utilized to develop a range of viable options that could move the trajectory of the system toward a desirable future. These interventions were subsequently linked to the Sustainable Development Goals proposed by the United Nations, and recommendations were developed accordingly.

An Evaluation of a Community-Based Therapeutic Recreation Special Event  
Victoria S. Diaz (Mentor: Dr. Lindsay Usher)  
*Recreational Therapy*

Three ODU students conducted a program evaluation for the Norfolk Therapeutic Recreation (TR) Center’s annual Halloween Party on October 25, 2019. This is a popular annual event hosted for clients of the Norfolk TR Center. The event consisted of activities such as water pong, ghost bowling, corn hole, target shooting, dancing, a haunted maze and food. Evaluators conducted face-to-face semi-structured interviews with 15 out of 17 of the participants at the event. The participants were asked to rate the activities on a scale that ranged from highly satisfied to highly unsatisfied. Evaluators also provided a visual scale using pumpkin faces with different emotions to assist participants in completing the questionnaire. Of the six activities, the food, dancing and haunted maze had the highest satisfaction ratings, and ghost bowling and water pong were the least satisfying for participants. In addition, participants were also asked three open-ended questions to summarize likes and dislikes from this year’s event, and suggestions for the future. The majority of the participants indicated that they had no suggestions for next year’s event; they thoroughly enjoyed the Halloween party and everything about it. Based on the results, evaluators suggest that the TR center continue the event and consider expanding the haunted maze activity in the future.

Co-Rumination Is Associated with Depression Only If One Holds Positive Beliefs about Rumination  
Nicollette Dwyer (Mentor: Dr. Matt Judah)  
*Clinical Psychology*

Rumination, repetitive thought about one’s circumstances, has been identified as a risk factor for depression. Positive beliefs about rumination also conveys risk factor for depression. Both rumination and positive beliefs about rumination are independently maladaptive, not depending on the other risk factor. Less research has examined co-rumination, which is rumination with another person. The goal of this study was to examine whether co-rumination’s association with depression depends on positive beliefs about rumination. Participants (N = 151) were undergraduate students recruited at a large southeastern university. Validated measures were used to assess depression (PHQ-9), co-rumination (CRQ), and positive beliefs about rumination (PBRS). Regression with bias-corrected boot-strapping was used to test whether positive beliefs about rumination moderated the association between co-rumination and depression. There was an interaction between co-rumination and positive beliefs about rumination, β = .01, confidence intervals = .001, .015. Co-rumination was associated with depression only when positive beliefs about rumination scores were 21 or higher. Results suggest that co-rumination is associated with depression for individuals with higher than average positive beliefs about rumination. Although other research has not found that beliefs about rumination affect the consequences of rumination, it appears that it does affect the consequences when rumination is done with another
person. Clinically, it is important to assess whether rumination is done alone or with others as well as beliefs about rumination for patients who co-ruminate.

Factors that Influence City Micro-mobility: An Understanding of Campus E-Scooter Use
Qwe’Vontae Eure (Mentor: Dr. Jing Chen)
Human Factors Psychology
This study explored the key factors that affected the use of shared electronic scooters (e-scooters, a form of city micro-mobility) as well as users’ awareness of any potential privacy issues with e-scooters, using the Lime scooters on ODU campus as a testbed. We recruited 12 frequent e-scooter users from ODU campus for semi-structured interviews designed to understand the users’ motivations and concerns. Our results suggest that students’ primary purposes for utilizing the e-scooters fall under the categories of convenience and entertainment. In terms of the users’ privacy concerns, our results show that they are largely unaware of the privacy terms used by the mobile application that is required to use the e-scooters, and users especially lack the knowledge of data gathering by the application and the many ways data can be used. As participants became more knowledgeable of the capturing of their data, they demonstrated more privacy concerns during the interview. This research only contained results from a small sample of ODU students, and future research should be devoted to the generalization of the current results and solutions to increase users’ privacy awareness.

Comparing Drinking-Related Harms and Use of Protective Behavioral Strategies among College Students With and Without Attention-Deficit Hyperactivity Disorder
Kenacia Goings and Douglas Glenn (Mentor: Dr. Cathy Lau-Burraco)
Psychology
2-8% of college students in the United States report having Attention-Deficit Hyperactivity Disorder (ADHD). Previous studies revealed that ADHD college students are more likely to binge drink (5+ drinks) and to experience alcohol-related problems (i.e., fail classes) than non-ADHD college students. However, ADHD students may differ from non-ADHD students on their use of protective behavioral strategies (PBS) to reduce negative consequences experienced from drinking (i.e., use a designated driver). This is an area in need of more research. Thus, the aims of the present study were to examine if college students with and without ADHD differed on their: 1.) level of alcohol-related consequences while controlling for typical alcohol use, and 2.) use of PBS while controlling for typical alcohol use. It was hypothesized that students with ADHD would experience more alcohol-related problems and report lower use of PBS compared to non-ADHD students. Participants were 532 (73.1% women; 90.4% without ADHD) college student alcohol users (i.e., consumed alcohol at least once in the past 30 days) between ages 18 to 25. Participants completed an online survey and were compensated extra credit in psychology courses. Results showed that the two groups didn’t differ significantly on alcohol-related problem scores or use of PBS to minimize harmful drinking. The findings suggest that existing interventions that target PBS may be useful for college students, regardless of having ADHD. Despite the current null findings, further research remains a need as young adults with ADHD are more likely to experience negative consequences from drinking than their peers.

Internship with the Eastern Virginia Office of Senator Tim Kaine
Nathan Hayward (Mentor: Dr. Jesse Richman)
American Politics
This was a valuable experience to have a position in a Senatorial office and take part in casework and constituent outreach. During my time at the office, I attended a lunch with Senator Kaine as
well as a housing and development panel at the Norfolk Library. I believe I will continue to benefit from this experience because it has taught me how to function in a professional setting and how to operate under Senate rules and ethics. This is also a field I would like to have a career in one day so I feel it has given me a head-start with hands-on experience. Prior to getting this position I wish I had known basic office things such as how to use a landline phone and office copy machine, also the database, VOICE, was very complex to use. I would tell other interested students to apply for the position even if they think they are unqualified. When I first applied, I did not think I would get it but in the end, the office told me that I was one of the best interns they have had in a long time and offered to write me numerous letters of recommendation for internships at other Senate offices as well as in the future.

**MirrorMatch: Real-Time Detection of Repetitive movements Using Smartphone Camera**
Noah Jennings (Mentor: Shubham Jain)

*Software Engineering and Systems and Integrative Physiology*

Keeping track of one’s personal fitness is challenging and a topic of ongoing research. For years, sports enthusiasts have relied on themselves, trained professionals, and systems implemented with wearable technology to assess the correctness of their movements. Unfortunately, these error-prone and costly practices can lead to misinterpreted progress or an injury related to the athlete’s workout routine. An automated approach to supervising exercise movements could help fitness enthusiasts and athletes log their physical activities and prevent injuries in a cost-effective manner. We propose MirrorMatch, a motion tracking system designed to assist athletes in monitoring their physical fitness. Our approach provides real-time movement analysis and feedback through the use of commercial off-the-shelf smartphone cameras, machine learning techniques, and image processing libraries. After the user completes an exercise, they are presented with a detailed workout report. Over time, multiple workout summaries can be combined to generate a progress report, giving the user insight into their performance to account for all development and help prevent any injuries. Unlike existing solutions that use sensors or immobile camera systems, MirrorMatch offers a practical and scalable solution to make fine-grained movement tracking more accessible. Such a system could impact the realm of physical therapy and help facilitate rehabilitation for injured patients by providing the necessary feedback over the course of their treatment.

**Shallow Mucosal Diverticulum of the Esophagus Results in Extensive Pneumoperitoneum – Spontaneous Idiopathic**
Cameron Jones (Mentor: Dr. Lisa Byrum)

*Medical Specialties*

On July 06, 2018, a 67-year old Caucasian female patient presented to the emergency room with complaints of roughly a 5-day history of mild abdominal pain. During physical examination, there was mild distress, mild firmness and tender to palpation of the abdomen with difficulty to auscultate bowel sounds. The patient’s laboratory tests and vital signs were both unremarkable. There were no associated symptoms of vomiting, nausea or change in bowel motility. Chest X-rays and computed tomography (CT) scan of the abdomen and pelvis both were positive of extensive pneumoperitoneum as well as a gastrointestinal endoscopy was performed and revealed no identifiable sources of the pneumoperitoneum. There was an absence of other signs of sepsis or perforated viscus. She had similar symptoms in 2009 with exploratory laparotomy; laparoscopic Nissen fundoplication yielding no identifiable pathology that is consistent with idiopathic spontaneous pneumoperitoneum. On July 11, 2018 the patient’s symptoms were unresponsive to medical management, with results of increased abdominal discomfort.
Exploratory laparotomy was recommended due to the concern of possible evolution into a full-blown abdomen surgery. Post-operative diagnosis revealed a shallow mucosal diverticulum of the esophagus which was most likely the source for the patient’s confirmed diagnosis of pneumoperitoneum. Following corrective surgery of the diverticulum, the patient was instructed to make life-style changes including dietary and exercise alterations with cessation of tobacco use to reduce the probability of pneumoperitoneum recurrence.

**Validation of Drug Like Inhibitors for the New Proton Activated Chloride Channel**

Zuri Jules-Culver, and Jiachen Chu (Mentor: Dr. Zhaozhu Qiu)

*Cellular and Molecular Physiology*

PAC, proton-activated chloride channel, is an evolutionarily conserved membrane channel that is activated by extracellular acidification. The molecular identity of PAC is recently cloned, opening the door for further investigations on the channel. Emerging evidence showed that PAC was involved in acid induced cell death, and that mice without the PAC channel showed better recovery after an ischemic stroke model. Yet, pharmacological tools that specifically inhibit PAC are lacking. To overcome this limitation and potentially provide treatment for acidosis related diseases, a high-throughput screening was performed and more than 2000 FDA (Food and Drug Administration) proved drugs were screened and repurposed as potential inhibitors of PAC.

During this experiment, the top three drugs found in the screening, Resveratrol, Neostigmine Bromide and 3-Formyl Rifamycin were tested as PAC inhibitors. It has been hypothesized that those three drugs should inhibit acidic induced PAC current. Whole-cell patch clamp experiment was conducted in HEK293 cells to confirm their inhibition on PAC. HEK293 cells were perfused with acidic solution to evoke PAC, and inhibitors were applied together with acidic solution after PAC reached complete opening. The reduction of currents were recorded and compared after the application of inhibitors. 20uM Resveratrol showed 32% inhibition on PAC, while 20uM Neostigmine Bromide showed 50% inhibition and 20uM 3-Formyl Rifamycin showed 52% inhibition when perfusing with pH=4.6 solutions. Our studies suggest that all three drugs showed significant inhibition of PAC channel activity, providing promising pharmacological means to manipulate PAC in vivo.

**Improving Surgical Safety through Education**

Raquel Killough and Alyssa Capizola (Mentor: Beth Tremblay)

*Public Health and Community Nursing*

Operation Smile is a nonprofit organization dedicated to providing cleft lip and cleft palate surgeries around the world. Surgical safety is the goal for every patient on every Operation Smile program (Operation Smile, 2019). Globally, unsafe surgical care procedures cause complications in up to 25% of patients. Almost 7 million suffer significant surgical complications annually, 1 million postoperative deaths (WHO, 2019). Surgical complications and death are two to three times higher in low- and middle-income countries than in high-income countries (WHO, 2019). Medical professionals from Northern and sub-Saharan Africa. Education--increase the capacity of local nursing workforce of highly skilled scrub nurses at the local mission level to ensure competent, safe, and high-quality practice in the Operating Rooms according to Operation Smile Global Standards. Identify the local nursing leadership to enhance future training. MH boxes--over 50% of Morocco team members who interact with the MH box will report increased knowledge confidence in responding to an MH crisis--over 75% of Morocco team members who interact with the MH box will agree it helps to ensure a quick response to a MH crisis. The curriculum is equally accepted by both the OR and scrub nursing participants.100% of participants stated that they “gained more knowledge in their area experience, importance of safety and high quality of patient
care, sterility and aseptic technique, learned how to handle both instruments and assessing the surgeon during procedure.” 100% indicated that they would recommend the MH box for future missions. Operation Smile Programs adhere with current MHAUS standards, which recommend an MH box in any areas that triggering agents will be administered to ensure quick access to treatment (MHAUS, n.d.).

**Ticks from Veterinary Perspective**
Gelencia Knight (Mentor: Dr. Holly Gaff)

**Biology**

Ticks and tick borne pathogens have always been a threat to domestic animals and pets. Traditionally ticks have been collected through vegetation sampling and from wildlife hosts. The ODU Tick Team has been conducting active surveillance since 2009. In the summer of 2019, we looked to supplement this process by asking veterinarians to contribute ticks to our research. To that end, we visited 29 veterinarian clinics in the Hampton Roads area and provided them with basic information on ticks found in our region and where to find ticks on animals they see in their clinic. We asked those who were willing to participate to notify us when they had ticks for pickup. The clinics were visited from June to August, and of those, six clinics contacted us for pickup. In conclusion, this study highlights the challenges of engaging busy veterinary practices in research. However, this study did provide an opportunity for spreading tick awareness specific to the Hampton Roads region.

**Condition Factor and HIS as Indicators of Condition of Plotosus Lineatus in the Philippines**
Nichole Leach and Eric Garcia (Mentor: Kent Carpenter)

**Marine Biology**

The striped eel catfish, *Plotosus lineatus*, is a benthic marine fish prevalent in tropical reef ecosystems that feeds on bottom-dwelling organisms, making the striped eel catfish particularly susceptible to pollutants in its environment. The current study searches for a correlation between the overall condition of *P. lineatus* and pollutant trends in the Philippines where both marine biodiversity and pollution are high. Length-weight relationship (LWR) and condition factor (CF) were calculated for a total of 120 individuals from three different sites in the Philippines to determine the growth patterns at each locality. The hepatosomatic index (HSI), was then calculated and used in combination with LWR and CF to estimate the overall condition of specimens at any given length. LWR and CF results illustrate negative allometric growth and lower HSI values for specimens from two localities, suggesting these populations may be in worse condition than the other site that showed stable isometric growth and larger HSI values. This data could potentially help in determining overall ecosystem health in the Philippines, as this research highlights the potential utility of *P. lineatus* condition as an indicator on the effects of pollution in the environment and how sites can be conserved accordingly.

**Predicting the Future of Our Oceans Using Cyanobacteria (Synechoccus): How Ocean Acidification May Impact Our Primary Producers**
Nichole Leach, Emalee Bennett, and Destiny Blow (Mentors: Anna Tansik)

**Marine Biology**

*Synechococcus* is a unicellular, photosynthetic, marine cyanobacteria that is found globally in temperate to tropical regions and is capable of living in conditions of variable salinity and light intensity. These microscopic organisms can provide bioeconomic services to humans, but can also negatively impact us in several ways. To further understand how these species react to our
changing climate, we aimed to research what other conditions this species can tolerate. We subjected *Synechococcus* to two contrasting pH levels by manipulating the concentration of carbon dioxide (CO$_2$) to test the cyanobacterium’s survivability and exponential growth through CO$_2$ bubbling. Biomass was obtained using in vivo fluorescence to determine the effect on growth rates, and pH was recorded to ensure consistency within the two treatments. We concluded that no significance was found between the ambient air and elevated CO$_2$ treatments. This outcome may be the result of a shorter experiment time, since other similar experiments are conducted throughout several generations, but leaves the opportunity to further explore this species’ threshold to changes in ocean acidity as well as rising temperatures.

**Reconstruction of Gene Regulatory Network in Early Bovine Embryo**

Sean Leonard (Mentor: Dr. Jiangwen Sun)

*Artificial Intelligence and Robotics*

Deciphering gene regulatory network (GRN) underlying cellular function is important. Not only does it lead to a better understanding of the fundamental mechanisms behind the high diversity in biological cells, but it also lays out the basis for potential intervention for desired cellular functions or treating diseases. Single-cell RNA sequencing (scRNA-seq) together with other high throughput sequencing techniques have made it possible to reconstruct the GRN at the systems level and in very fine detail. The algorithms constructing the GRNs are usually general enough to be applied to different species and thus used to make new discoveries rapidly. Currently, these methods have not yet been utilized on the bovine species, which has indications of being even more similar to the human developmental process at an embryonic level from the perspective of gene expression than the mouse. Using bovine data, we intend to take advantage of this connection between the bovine and human species to make discoveries that could provide meaningful results when studying the viability of *in-vitro* and *in-vivo* embryos at their various stages. With more data highlighting the differences in the gene expression between *in-vitro* and *in-vivo* fertilization, medical institutions will be better poised to offer healthy embryos to mothers and thus allow for more children to be born from these nonconventional methods. As a larger goal, medical institutions will be better suited to understand the embryonic process and thus diagnose health issues long before they would otherwise be diagnosed.

**Student Preferences for Workplace Benefits 2019**

Jamayca Madolid, Maya Hinton, Maria Llanos, Reda Valentin, and Joy Owens (Mentors: Dr. Emily Campion and Dr. Sheila Keener)

*Benefits and Compensation*

In Fall 2019, the Management Lab in the Strome College of Business surveyed 244 undergraduate students regarding their preferences for workplace benefits. Including wellness, health, leave, career development, education, and other benefits. Respondents considered each benefit category (e.g., Technology) as well as specific offerings (e.g., Subsidy for cell phone bill for employee-owned device) and selected one of the following: 1) Must-Have (I will only accept a job that offers this benefit); 2) Attraction (This benefit will increase the attractiveness of a job, though it is not a requirement); 3) Neutral (This benefit will not impact my choice to accept a job); or 4) I Don’t Know What This Benefit Is. Overall, most students in this sample indicated that vacation, sick, and personal leave (57%); retirement plans (53.7%); holidays (52%); health (50.4%), dental, vision, and other insurance plans (50.8%) were must-haves. The categories that were rated as attractive, but not required, included wellness spaces (68.9%), technology (67.2%), education (66.8%), and financial advice (66.8%). While health-related categories were one of the Top 10 "Must-Haves," students also reported that they did not know what the specific offerings were.
For example, 50.4% of students indicated health insurance plans were a "Must-Have," 32% indicated they did not know what a high deductible health plan was. Students generally reported being neutral about it. New child benefits, though this may be due to 70% of our sampling being 18 and 22 years old. These findings have important implications for local organizations that recruit from Old Dominion University talent pool.

A Case Study Involving Plum Tree Island National Wildlife Refuge
Shawn McCarren (Mentors: Dr. Jennifer Grimm & Hans-Peter Plag)
Environmental Studies
Plum tree Island is an island located in Hampton Roads, Virginia near the end of the Chesapeake Bay. This island is important because most of the island is a salt marsh and wetland which was used as a bombing range by the Department of Defense. Wetlands are very important because they mitigate the effects of sea level rise, and climate change while also providing an ecosystem for other animals. The wetlands are also disappearing which is why this area is so important to focus on. The U.S. Fish and Wildlife Service aims to conserve and protect this island as a national wildlife refuge while opening the whole refuge for public use. This is an example of a wicked problem, and wicked problems are unique. The OEAS 466W course provides a “learning by experience” environment, in which students research case studies focusing on wicked problems related to real-world issues. Case studies are an important tool to develop options to address such wicked problems. Addressing these problems often requires a participatory trans-disciplinary approach. Wicked problems are always symptoms of other problems and this systemic character requires systems. The case study aims to develop interventions that would help to make progress towards this goal.

Radio Frequency Signal Classification for Drone Detection
Michael Nilsen (Mentor: Dr. Sachin Shetty)
Signal Processing and Systems and Communication
There is a need to enhance a current Radio Frequency Signal Classification (RF-Class) toolbox that can detect, monitor, and classify wireless signals. This toolbox’s ability to accurately classify over-the-air radio signals will provide insights into spectrum utilization, device fingerprinting and protocol identification. The classification of RF signals is currently done using the modulation scheme, exploitation the cyclostationary features, and leveraging RF band allocation information. Once the modulation scheme is recognized, the scheme is demodulated, decoded, and the packets are extracted. Along with defense, this recognition also has the capability to be used for cyber offensive strategies. This current toolbox has been tested in a high signal-to-noise (SNR) environment. The environment has been stripped of other devices, interferes, and obstacles. Since the created lab environment does not accurately represent the real world, this project has a final goal to enhance the automated RF classification capability in GNU Radio to accurately engineer a system to compete with real-world conditions.

Virginia Beach is for Lovers of Dark Tourism
Ashley-Nicole Chinyereugoma Nnadi, Sierra Powell, Lisa Terry, and Avante Pringle (Mentor: Dr. Lindsay Usher)
Educational Assessment, Evaluation, and Research
Four ODU students conducted a program evaluation for the Unforeseen Circumstances -- Tales of Misfortune Tour of Cedar Grove Cemetery in Norfolk, Virginia on October 5, 2019. Every year, the Norfolk Society for Cemetery Conservation offers historical tours to educate people in the Hampton Roads area about Norfolk cemeteries and the people buried there. This tour was hosted
by a knowledgeable tour guide who told stories of all the mysterious deaths in the cemetery. To determine participants’ opinions of the tour, evaluators distributed a one-page survey to participants at the end of the event. Eighteen participants filled out the survey. The survey items focused on participants’ previous experience of Norfolk Cemetery tours, the way they learned about the tour, likes and dislikes, and willingness to return and recommend the tour to others. After data analysis, evaluators determined that most participants had attended a tour run by the Norfolk Society for Cemetery Conservation before. Education was a main reason many people attended the tour: they enjoyed learning about Norfolk history. Those that stated they had attended this type of tour before also stated that they would like to know more about disease-related deaths. Many participants stated they would attend another tour with some suggested additions. Evaluators recommend that the organization offer an extra day for the tour to accommodate for inclement weather. Also, for the organization to invest in a better-quality speaker that is more equipped for a bigger crowd, this would give the participants a better experience while touring.

Exploring Economic and Occupational Correlates of American Adult Anxiety Levels From 2010 – 2018
Lauren Norquist and Phil Yorkman (Mentor: Andrew Bennett)
Industrial and Organizational Psychology
Recent trends show that levels of anxiety have been increasing in Americans the past few years (American Psychiatric Association, 2018). In this project, we explored economic and occupational reasons that may explain this increase, such as wage stagnation, a rapid increase in information availability, and changes in work culture. Using data from 2010-2018, this research presents how trends of anxiety have changed and what causes those trends. Findings show an unexpected trend in “feelings of anxiousness, worry, or nervousness”, with the most fluctuation in the response “weekly” out of the choices daily, weekly, or monthly. Surprisingly, we also discovered a flat trend line in some responses, as opposed to our initial assumption that the data would show a positive linear trend line. Future research, including ongoing interviews with employees about how work stress is evolving in the modern world, are discussed.

Biophysical Characterization of the Full-Length Par-4 Tumor Suppressor
Christiana Ntangka, Andrea Clark, Krishna Raut and Komala Ponniah (Mentor: Dr. Steven Pascal)
Biochemistry and Structural Biology
Tumor suppressor proteins are responsible for important cellular functions, such as DNA repair and cell apoptosis. The Prostate Apoptosis Response-4 (Par-4) tumor suppressor is encoded by the Par-4/ PaWR gene found in chromosome 12q21.2. The 38 kilodalton full-length Par-4 (FL)-Par-4 has been shown to induce cell apoptosis in response to various stimuli in different cellular systems. However, FL-Par-4 protein is intrinsically disordered under neutral conditions in vitro. Par-4 translocates into the nucleus for cell apoptosis induction only after it is cleaved by the caspase-3 at aspartic acid 131. The reason for this cleavage requirement has not yet been determined. Our previous research with the caspase-3-cleaved fragment (cl-Par-4) have shown that ordered protein structure can be induced by either acidic conditions or by a high concentration of monovalent cations. In this study, we are investigating whether similar conditions also induce structure into (FL) Par-4. Determining FL Par-4 structure will enhance our understanding of structural similarities and differences between the FL Par-4 and cl-Par-4 fragment. Preliminary circular dichroism (CD) data of FL Par-4 show that both monovalent and divalent cations do affect the degree of structure in FL-Par-4. Additional techniques, such as tyrosine fluorescence, size exclusion chromatography with multi angle scattering (SEC-MALS), and dynamic light scattering (DLS) will also be used to characterize FL Par-4 structure under various
conditions. These results will increase our understanding of Par-4 structure in relation to the cellular environment and how cleavage alters Par-4 structure, including the ability of Par-4 to be induced to fold via various stimuli.

Recognizing Lexical Patterns that Arise in the Wake of White Nationalist Unrest
Pettie Perkins (Mentor: Dr. Bridget Anderson)

*English Language and Literature*

In response to a rising tide of white nationalism during and after the Charlottesville Alt-Right Rally in 2017, I undertook work of analyzing part of a corpus of language data transcribed from screenshots of white nationalist message boards. The language I linguistically coded is used to incite anger, create dissonance, communicate plans to collectively come together and make their presence known. I worked with a team of students directed by Dr. Bridget Anderson on a project named People Educating Citizens About Racism and White Nationalism (PECAR). I worked on a lexicon, which is like a dictionary of specialized Nazi vocabulary words. Some examples of a lexical items are “doxed,” a shortened form of documents, “sacked off,” is a slang word used and it means to avoid or stop doing something, and another is “goose step,” a military marching step in which the legs are not bent at the knee. This information is and will be useful in determining when white nationalists plan to surface and what their desired operation will be. The project People Educating Citizens About Racism and White Nationalism (PECAR) is important because it allows people to comprehend the words used by white nationalists. This information is also useful in knowing what lexical patterns arise in the wake of white nationalist unrest.

The Regulation and Characterization of the *Clostridioides* Difficile Infection Through the Stringent Response Mechanism
Anthony Resek, Astha Pohkrel, and Mariam Mhanna (Mentor: Dr. Erin Purcell)

*Biochemistry*

*Clostridioides difficile* Infection (CDI) is one of the widest spread hospital-acquired infections in first world. It persists as dormant spores in aerobic environments, which colonizes the gut upon host ingestion resulting in the secretion of cytotoxins. Symptoms range from watery diarrhea to life threatening pseudomembranous colitis. Notably, *C. difficile* is incredibly resistant to a wide array of antibiotic treatments. We focused our attention to the stringent response pathway, which is a stress-induced signaling pathway. Bacterial cells accumulate two alarmones, guanosine tetraphosphate (ppGpp) and guanosine pentaphosphate (pppGpp) in the cytoplasm via enzymes belonging to the Rel/Spo homolog (RSH) family. These small molecules facilitate bacterial survival during stresses while also regulating virulence factor production. For the first time, we’ve confirmed *C. difficile* genome to encode *rsh* and *relQ*, suggesting that this organism can also mount the stringent response cascade. RSH, a long bifunctional synthetase and hydrolase domain harboring protein and RelQ, a synthetase domain-only carrying protein regulate the stringent response in different Gram-positive species. Through radiolabeled thin layer chromatography, we have also shown *C. difficile* RSH (CdRSH) to be a unique ppGpp synthetase *in vitro*. We are currently utilizing site overlap extension and site directed mutagenesis techniques to render *C. difficile* RSH catalytically inactive. Recent work has also included the designing and cloning of truncation constructs from the gene sequence of full-length *C. difficile* rsh. By cloning the N-terminal catalytic region of CdRSH, we aim to characterize the mechanism(s) by which RSH’s C-terminal regulatory region inversely regulates the enzyme’s opposing catalytic activities.

Single-Cell Characterization of *Clostridiodies* Defficile Motility Using Anaerobic Live Cell Microscopy
**Biochemistry**

*Clostridioides difficile* (*C. difficile*) is an anaerobic bacterium responsible for CDI (*Clostridioides difficile* infection), a common problem in hospitals and for people using antibiotics, due to the bacteria’s resistance to common treatments and ready appetite for sugar byproducts in the intestine. *C. difficile* has proven to be resistant to multiple antibiotic families, including beta lactams and fluoroquinolones. The bacteria have two forms: dormant spores that persist in the environment and spread the infection, and vegetative cells, which proliferate within the host colon and produce virulent toxins. Little is known about the behavior of vegetative cells within hosts, because they are strict anaerobes and killed by the environmental oxygen. It is known that the organism is a motile, flagellated bacterium which swims through liquids and can even traverse the surface of solids through the extension and retraction of pili *in vitro*. Here, we demonstrate a novel methodology for capturing active imagery of the microbe at the level of individual cells, and show that the epidemic *C. difficile* strain R20291 has its motility regulated by the presence of different sources of energy that it is cultured in. This provides a superior ability to analyze distribution patterns of bacteria outside the anaerobic chamber, in addition to showing that this distribution is highly regulated by the nutritional substrate available to the microbe. Different concentrations of both arabinose and glucose showed no difference in motility for *C. difficile*, whereas higher concentrations of the mucus component N-acetylneuraminic acid (Neu5Ac) caused significant reductions in movement and direction changes in the bacteria. This suggests that *C. difficile* responds to substrate nutrient type and concentration through changes in behavior and may actively target gut mucus as a colonization site.

**Medication Information Card Study at the Foodbank of Southeastern Virginia**

Antionette Rivera, Tavia Hunt, David Pantagan, Chelsa Johnson, Joana San Luis, Mia Mitnaul, and Kirstina Huey (Mentor: Beth Tremblay)

*Public Health and Community Nursing*

The aim of this project was to determine what top three medications and chronic diseases low income individuals need more information about as well as receive feedback about a medication card containing these items. Chronic diseases in low income individuals is a prevalent issue. When diagnosed with a chronic disease many of these individuals must make important lifestyle changes as well as follow a medication regime to manage their condition. Many people are often diagnosed with more than one chronic disease and must remember the medication regime for each chronic disease. Trying to remember what foods to avoid, foods to consume, lifestyle changes to make, as well as interactions for these medications can be hard for these individuals. The goal of this project was to make a medication template that would sum up this information for these individuals to have in one place. A total of sixty participants diagnosed with a chronic disease were surveyed. These individuals were asked if they had any chronic health diseases, what they would be most interested in learning about, what format would they like information provided to them, questions they had about their medical condition, and the name of the medications they were prescribed for their medical condition. The top three medications were Warfarin, Insulin, and anti-hypertensives. The top three chronic diseases were hypertension, hyperlipidemia, and diabetes. Individuals are willing to learn and take active steps towards personal health management when they have the appropriate tools.

**Systematic Analysis of the Use of Artificial Intelligence (AI) in Regulating Terrorist Content on Social Media Ecosystem Using Functional Dependency Network Analysis (FDNA)**
Alaina Roman and Cesar Ariel Pinto (Mentor: Dr. Cesar Ariel Pinto)

Communication Technology and New Media, Other Operations Research, Systems Engineering and Industrial Engineering, and Risk Analysis

This research is a systemic analysis of emerging risks to the use Artificial Intelligence (AI) in regulating terrorist content on social media ecosystem using Functional Dependency Network Analysis (FDNA), a proven system-design-and-analysis tool. The research has three phases: 1) framing the problem by identifying and describing AI ecosystem elements as intended, implied and explicit objectives, discernable attributes, and performance indicators; 2) describing the idealized problem-solved scenario, which includes detailing ‘success’ states of the ecosystem; and 3) systemic risk analysis including identifying failure scenarios for each element and establishing causalities among elemental attributes leading to failure scenarios. This research contributes toward a sustainable and more robust solution to the issue of regulating one particular form of malicious content on social media platforms (i.e., terrorist content) based not on one perspective but on the entire ‘ecosystem’ using FDNA.

Validity and reliability of Eye-Tracking as a Measure of Impasse Problem Solving
Emily Russell (Mentor: Dr. Ivan Ash)

Cognitive Psychology

Creativity in human cognition will be the focus of the current study. More specifically, the theory of insight problem solving will be investigated. Insight includes a moment of high amounts of suddenness, high amounts of confidence, and low amounts of effort involved in finding the solution. In the process of insight problem solving, a person will most likely reach a period known as impasse, the subjective feeling of not knowing what to do or simply being stuck. This study aims to identify the validity and reliability of eye tracking as a measure of insight by comparing the method against Think Aloud Protocol and Aha! Ratings, which is a self-reported measure. The study predicts eye tracking will be more reliable compared to the current methods of Think Aloud and Aha! Ratings since it can decrease bias in interrater reliability and will have predictably less interference in reliability since it does not require the participant to have a full understanding of the concept and rate themselves subjectively.

Quantification of Density Fit of Atomic Model to Helices in 3D Cryo-Electron Microscopy Images
Peter Scheible, Salim Sazzed, Maytha Alshammari, and Willy Wriggers (Mentor: Dr. Jing He)

Bioinformatics and Structural Biology

Cryo-electron microscopy density maps at medium resolutions (5-10Å) offer insights about secondary structures, such as α-helices and β-sheets. However, they lack the density characteristics of side chains that are important in structure determination. Among over 800 entries of medium-resolution density maps linked to atomic models in the Electron Microscopy Data Bank (EMDB), various levels of fit have been observed previously. We propose a measure of cylindrical agreement between the density and atomic model of a helix for medium-resolution density maps. An analysis of 30,994 helices in 3,247 protein chains with both medium-resolution density maps and atomic models shows a wide range of F1 scores from 0.171 to 0.848. The results indicate a tendency for the density distribution around a helix to deviate from the cylindrical shape expected by the model when the F1 score is below 0.55.

Exploring the Longevity of Ixodes Affinis in Different Regions of Virginia
Marcus Simon (Mentor: Dr. Holly Gaff)

Environmental Microbiology and Microbial Ecology
Invasive species are those that do originate from that specific location but can cause harm to the environment they move into. *Ixodes affinis*, a tick that is known not to bite humans, is one of these invasive species that has made its way up the Atlantic coast and became established in Coastal Plain region of Virginia. However, this species has not been found within the Piedmont region of Virginia, an area that’s potentially not suitable for their needs. A previous study eliminated the hypothesis that this difference could be explained by elevation differences. Because of this, a study was conducted to determine if the differences in soil composition from the Coastal Plain and Piedmont had an impact on the species longevity, which could explain survival in only the Coastal Plain. Several ticks were collected from Virginia Beach and split between two jars: one had soil from the Piedmont region and the other from the grounds of Old Dominion University. Between late June and early August, presence of tick life, temperature, and humidity were checked daily followed by weekly checks. Soil tests were also conducted to determine if a lack or excess of nutrients influenced the species longevity.

**Magnesia Alba “Chalk Dust” and Air Quality: A Comparative Study of Two University Rock Walls**  
Forrest South, Anthony Desocio, Grace Tolbert, and Christopher Zajchowski (Mentor: Kyle Davis)  
*Environmental Sciences*

Magnesia alba, climbing chalk, creates a fine powdery dust that can be visibly seen or recognized. This chalk dust produces particulate matter (PM2.5 and PM10) which can cause a negative impact on air quality, especially in enclosed spaces such as climbing gyms. This can lead to significant health risks including lung or respiratory issues. In this study, Dylos DC 1700 particulate matter monitors were placed at Old Dominion University (ODU) and Appalachian State University (ASU) climbing walls to understand potential health risks. Monitors were set to collect particulate matter continuously for a four-hour period. Data were collected monthly in five-day sampling periods throughout the Fall 2019 semester. The data were analyzed in Microsoft Excel for descriptive and inferential statistics. Preliminary analysis shows that PM2.5 and PM10 values at ‘good’ to ‘moderate’ at ODU based on the Environmental Protection Agency (EPA) air quality index; conversely, ASU measurements were consistently in the unhealthy (PM2.5) to hazardous range (PM10). These disparities for PM2.5 and PM10 across settings demonstrate a need to conduct an in-depth evaluation of the air quality at ASU and other rock climbing gyms. Considering that there are populations (i.e., staff, regular climbers) at high risk to health impacts, understanding some of the conditions that can influence the air quality is crucial.

**From Their Perspective: A Qualitative Analysis of Stroke Survivor’s Motivation to Participate in Rehabilitation**  
Kate Tinsley (Mentor: Dr. Rachel Johnson)  
*Speech Pathology and Audiology*

It is common practice for healthcare professionals to make judgments about a patient’s motivation based on their demeanor and compliance with therapy. Motivation is one of the predictors used to determine a stroke survivor’s rehabilitation potential. There are several theories and constructs for motivation; however, there is limited research applying these concepts in stroke rehabilitation. Rehabilitation clinicians primarily rely on their clinical judgment and consult the evidence from related fields to identify the motivational needs of a stroke survivor. The objective of this study was to understand specific barriers to participation and identify motivational needs to sustain engagement in rehabilitation from the stroke survivor’s rehabilitation experiences. This is a qualitative study involving six stroke survivors interviewed in two separate focus groups. The interview questions obtained information across seven themes: autonomy, competence, self-determination, self-efficacy, confidence, the external focus of
attention, and relatedness. The interviews were videotaped, transcribed verbatim, then analyzed using a thematic approach. Preliminary analysis identified similar experiences for themes of relatedness, autonomy, confidence, self-determination, and competence. The analysis of the positive and negative experiences aligns to identify specific barriers and motivators for participation. The outcomes of this study identify barriers to participation and confirms the constructs of motivation important for participation in rehabilitation from a stroke survivor's perspective.

Exploring the Mediating Effects of American and Heritage Cultural practices Between Discrimination and Social Anxiety
Taylor Webb, layonna Brown and Kyla Carr (Mentor: Dr. Alan Meca)

Developmental and Social Psychology

Although college enrollment rates have risen, Hispanic/Latinx only account for 9% of emerging adults who complete bachelor’s degrees (Krogstad, 2016). Previous research has found anxiety disorders negatively affect attendance and academic performance (Baez, 2005). Social anxiety, often defined by the fear of negative evaluation in social contexts (Hofmann, Asnaani, & Hinton, 2010), may play a role in Hispanic/Latinx retention. Although previous research has found associations between acculturation and mental health (Crockett et al., 2007), links between acculturation and anxiety are understudied. Additionally, while links between discrimination and social anxiety have been found among Black youth (Levine et al., 2014), the relationship remains unexamined among Hispanic/Latinx. Consistent with research emphasizing the possibility of interactive effects among cultural processes (Meca et al., 2019), this study aims to examine independent and interactive effects of acculturation and discrimination on social anxiety among Hispanic/Latinx college students. The sample utilized for this study consisted of 1,072 first/second-generation Hispanics (Mage = 19.70, SDage = 1.62) from the Multi-Site University Study of Identity and Culture (MUSIC; Castillo & Schwartz, 2013). A multiple linear regression was estimated to determine discrimination, US and Heritage cultural practices, and their respective interactions accounted for a significant amount of the variance in participant anxiety symptoms, R^2 =.046, F(9, 1088) =6.826.

Effects of Ginger on Performance and Perceptual Responses to Maximal Sprint Cycling
Lauren White and Patrick Wilson (Mentor: Dr. Patrick Wilson)

Sports Science

Historically, ginger has been used as a nausea and pain remedy by many societies. This research study is seeking to discover the effects of ingesting ginger before a 30-second Wingate, a cycling test that can induce both nausea and leg pain/discomfort. This study is employing a randomized, double-blind, placebo-controlled crossover design. For the protocol, participants complete a Wingate familiarization at an initial visit. Then, they complete additional Wingate tests at two subsequent visits. They are given a standardized meal (e.g., Clif bar) that is consumed three hours before testing. Supplements are taken one hour prior to testing. During the Wingate tests, participants do a 5-minute warm-up. After briefly resting, they gradually rise up to 90 RPM over a 30-second run-in period. At the end of this run-in period, a torque factor equal to 0.8 N·m/kg of body mass is applied as a braking force, and participant’s cycle maximally for 30 seconds. Afterward, there is a 5-minute cool-down. To assess nausea, a 0-10-point scale is being used, 0 being ‘none’ and 10 being ‘extreme’ nausea. The subjective intensity of the exercise is being measured with the rating of perceived exertion (RPE) scale (0 = ‘nothing at all’, 10 = ‘very, very hard’), while leg pain is being assessed with a similar scale (0 = ‘no pain at all’, 10 = ‘extremely intense pain’). To evaluate performance, peak power, mean power, and RPM are recorded for
each test. Differences between the conditions will be made with paired t-tests and/or Mann-Whitney U tests.

**Coral Diversity and Percent Algal Cover on Inshore vs. Offshore Patch Reefs with and without Herbivorous Crabs**

Mary Williams, Tiffany Wood (Mentor: Dr. Mark Butler)

*Marine Biology*

Coral reefs are the most diverse marine community and are very susceptible to changing environmental conditions. The Florida Keys reef tract has been facing environmental stressors causing degradation of the coral. One of the main stressors on these coral reefs is algae covering the coral. In this experiment we are analyzing the coral diversity, coral abundance, and percent algal cover on 32 coral patch reef sites, 16 inshore and 16 offshore, in the lower Florida Keys. Our experiment focused on testing the ability of the herbivorous crab *Maguimithrax spinosissimus* to maintain low algal cover on the out planted coral patch reefs. The proposed research is part of a larger project being conducted by Dr. Mark Butler and his laboratory examining the effects of *M. spinosissimus* on coral restoration. 10 random benthic photos were taken using a photo quadrat, these photographs will be analyzed using the Coral Point Count (CPC) program. This program will allow us to identify and count the various out planted and naturally occurring corals on each patch reef within each photo quadrat using a set of codes. The overall analysis will allow us to provide support or disprove the hypothesis that herbivorous crabs are having a positive effect on coral restoration.
Orofacial Manifestations of Lyme Disease: A Systematic Review
Kelsey Jones and Brenda Bradshaw (Mentor: Dr. Holly Gaff)
Life Sciences

Several orofacial symptoms of Lyme disease can affect anatomical structures of the head and neck which are frequently examined by dental professionals. The purpose of this systematic review was to examine the literature to identify the frequencies of orofacial manifestations documented in U.S. populations with Lyme disease. Four electronic databases (Dentistry and Oral Sciences, PubMed, Cinahl Plus, and Medline) were systematically searched from May 2019 until October 2019 using keywords and MeSH terms to identify relevant studies. The review followed guidelines set forth in Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA). A modified version of the Cochrane Data Collection Form for Randomized Control Trials and Non-randomized Control Trials was used to assess quality. An initial search extracted 217,381 articles; 43 met inclusion/exclusion criteria and were reviewed for quality. Twelve articles published from 1992-2017 were deemed appropriate for inclusion in the systematic review. All were from non-dental journals and represented mostly male populations from less than half (n=6) of the endemic states. A total of eight orofacial manifestations occurring within head/neck regions often examined by dental professionals were documented: headache (n=11, 92%), facial palsy (n=11, 92%), temporomandibular joint arthralgia (n=2, 17%), altered taste (n=1, 8%), stiff neck (n=4, 33%), sore throat (n=1, 8%), neck pain/arthralgia (n=5, 42%), and erythema migrans rash (n=1, 8%). Current research regarding orofacial manifestations of Lyme disease is needed so that this medical phenomenon can be well understood by dental professionals in order to best serve their patients.

Feeding Behavior of Myzobdella Lugubris Leech and Its Effect on the Oral Epithelial Layer of Largemouth Bass
Ciara Branco (Mentor: Dr. David Gauthier)
Marine Biology

Largemouth bass currently make up a major recreational sport-fishery in Back Bay Wildlife Refuge, located in southeastern Virginia. Between 1962 and 1987, storm disturbances of barrier islands caused an introduction of salt water into the freshwater system. This increase in salinity within the system caused a decline in freshwater fish. In 2009, supplemental stocking of largemouth bass was conducted within Back Bay with hopes of increasing the bass population (Pomposini et al. 2019). Since 2009, the bass population has increased, however larger bass are not as abundant as previously expected (Pomposini et al. 2019). Beginning in 2006, observations were made of Myzobdella lugubris leech infestations in the oral cavity of largemouth bass in Back Bay. Attachment sites of M. lugubris can leave ulcers in the oral cavity of bass that become infected with bacteria (Faisal, Schulz, Eissa, & Whelan, 2011; Noga et al. 1990). While some biological information on M. lugubris is described in the literature, duration of attachment, feeding, and detachment of M. lugubris leech infestations in the oral cavity of largemouth bass in Back Bay. Attachment sites of M. lugubris can leave ulcers in the oral cavity of bass that become infected with bacteria (Faisal, Schulz, Eissa, & Whelan, 2011; Noga et al. 1990). While some biological information on M. lugubris is described in the literature, duration of attachment, feeding, and detachment of M. lugubris leech infestations in the oral cavity of largemouth bass in Back Bay. Attachment sites of M. lugubris can leave ulcers in the oral cavity of bass that become infected with bacteria (Faisal, Schulz, Eissa, & Whelan, 2011; Noga et al. 1990). While some biological information on M. lugubris is described in the literature, duration of attachment, feeding, and detachment of M. lugubris leech infestations in the oral cavity of largemouth bass in Back Bay.
progression/regression of pathology in the host oral cavity. In conjunction with the studies described above, we performed a tag-recapture study to address questions of *M. lugubris* natural history. Here we report on the findings of that study and provide clarity on the leech feeding cycle and its effects on the epithelial layer within the oral cavity of largemouth bass.

**City of Norfolk Underground Storage Tank Analysis**  
Jacob Hall (Mentor: Hua Liu)  
*Geographic Information Sciences*  
Leaking Underground Storage Tanks represent a hazard to the health of Norfolk’s citizens and the surrounding environment. The Norfolk Environmental Commission estimates that as many as 70% of Underground Storage Tanks in Norfolk are in danger of leaking or may already be leaking. My research builds on previous research in Leak Prediction Modeling to address the issue of leaking Underground Storage Tanks in the City of Norfolk. A major cause of Underground Storage Tanks developing leaks is corrosion. Norfolk’s location, surrounded by rivers, wetlands, the Chesapeake Bay and the Atlantic Ocean make it a particularly harsh environment for Underground Storage Tanks due to soil moisture, highly corrosive soils, and storm surge. By using data from the Virginia Department of Environmental Quality’s Virginia Petroleum Storage Tank Database, the US Department of Agriculture’s Web Soil Survey, and the US Army Corps of Engineers New Leak Prediction Age Model, and spatial analysis techniques, I hope to produce a reasonably accurate model of possible leaking Underground Storage Tank Locations in the City of Norfolk. The model could then be used to develop maps and data that can be used in conjunction with field teams via web applications to confirm the accuracy of the model and help the City of Norfolk to reach its goals of reducing the harm to its citizens and surrounding environment from Underground Storage Tanks.

**9:00-10:00 AM (Learning Commons: Room 1311)**  
*Darden College of Education and Professional Studies/LeADERS*  
Moderator: Alex Ehler & Ren-Neasha Blake

**Promoting Resiliency and Flourishing through Collegiate Outdoor Orientation Programming**  
AbigailRossiter (Mentor: Dr. Eddie Hill)  
*Outdoor Education*  
The transition to college is often a difficult period of adjustment for most young adults (Kelly, 2019; DeBerard, Spielmans, & Julka, 2004). During the transition to college, young adults encounter new challenges and are forced to make critical decisions. Adapting to this major life event can cause tremendous stress and lead to more serious psychological distress (Lu, 1994). Resilience and flourishing are two common terms use to define the need to overcome adversity. Being resilient is one’s ability to deal with and adapt to stress or adverse circumstances (Benard, 2003; Wagnild & Young, 1993, Wolin & Wolin, 1993). Similarly, flourishing is “a state in which an individual feels positive emotion toward life and is functioning well psychologically and socially...such individuals are filled with emotional vitality and are functioning positively in the private and social realms of their life” (Keyes & Haidt 2003, p. 6). Young adults who are not able to develop the necessary processes to manage these new stressors often leave higher education during the first year. Leaving is not only detrimental for the individual, but also can cause negative repercussions for the university (DeBerard et al., 2004). Therefore, alleviating stress during this difficult period of transition has been the focus of many higher education institutions. In order to achieve this, all accredited colleges and universities in the United States have a first-year orientation program (Bell, Gass, Nafziger & Starbuck, 2014). Thus, the purpose of this study is to
identify the effects of an outdoor orientation program on participants’ levels of resilience and flourishing.

The Holistic Impacts of Intergenerational Senior Wellness Programs for Recreational Therapy Professional in Training and Residents in Long Term Care Settings
Victoria Díaz, Gaiyle Bannister, Meleah Huber, and Vincent Horten (Mentor: Shelly Beaver)
Recreational Therapy and Gerontology
Intergenerational programs serve the older adult population alongside young children, youth, and/or young adults and their design is intended to be mutually beneficial. In this session, we will discuss the community engaged learning project with Old Dominion University Recreational Therapy students and their residential care partnership with Beth Sholom Village. We will further present the holistic benefits experienced by both populations and identify changes to perception towards aging. Additionally, we will emphasize the benefits of this program to future Recreational Therapy professionals and highlight this program as a model for improving the field of Therapeutic Recreation and the quality of life of the individuals which our interventions serve.

LeADERS Program and the Value of the ePortfolio for Demonstrating Skills: Actively Practicing Knowledge Can Demonstrate Skills to prospective Employers
Lesia Pristas (Mentor: Jenn Grimm)
Other Education
There is significant value in developing a professional ePortfolio. From enhancing digital literacy to demonstrating job skills in a rich media format, students of the LeADERS Program will show prospective employers that they are striving for highly enriching courses in academia for enhancing their skills as an employee. My presentation will discuss the benefits of developing an ePortfolio as a LeADERS candidate, the challenges, and what students need to know regarding utilizing media. I will focus on two areas to include rich media and the value of course reflection. First, I will discuss using video and audio to create interest in the knowledge I gained from coursework. Utilizing technology like Camtasia, Youtube, and other simple media helps to bring to life the work I am doing which increases the likelihood that a prospective employer will actually look at artifacts. Second, I will argue that by reflecting creatively on knowledge gained through the LeADERS Program, it helps to develop the skills I will take into the next chapter of my life. There is a difference between knowledge and skill for career advancement. The difference is practice. The LeADERS Program allows for that practice. Classes go from being obstacles that students must put behind them to being a part of what paves the way for being sought after in choice careers and graduate programs. The LeADERS Program is an opportunity for enriched learning and its ePortfolio allows you to transport these experiences with you in to your future.

9:00-10:00 AM (Learning Commons: Room 1306)
College of Arts and Letters 1
Moderators: Holli Turner, Oge Agim & Saige Hill
When Death Comes Knocking
Madeline Keller (Mentor: Anne Muraoka)
Ancient, Medieval, Renaissance and Baroque Art and Architecture
The paintings of the Dutch painter Hieronymus Bosch have been the center of extensive scholarship with the exception of Death and the Miser, which has largely been neglected by scholars. It is considered to have once been the inside right wing of a now dismantled triptych. This work shows an old man sitting up in bed as he watches Death peer its skeletal head around
his bedroom door. The old man is surrounded by an angel and six demons, one of which is offering the Miser a bag of money. *Death and the Miser* is often regarded by art historians as a warning against avarice or as a now incomplete work on the seven deadly sins. However, viewing this work solely as a warning for the consequences of greed is an oversimplification and viewing it as incomplete ignores that fact that many of Bosch’s triptychs include panels with distinct scenes. The subject of this painting falls in line with the popular fifteenth century texts, the *Ars Moriendi*, which was written to help people prepare for their death. Its intention was to let them know what to expect and how to deal with death graciously. This paper argues that the demons in Hieronymus Bosch’s *Death and the Miser* represent the five temptations that come to you in your final hour of life, as described by the *Ars Moriendi*.

**Built for the Higher Beings: Hilma af Klint and the Construction of the Solomon R. Guggenheim Temple**
Kayla Everett (Mentor: Vittorio Colaizzi)

*Modern Art and Architecture, Painting and Women’s History*

Hilma af Klint was a Swedish painter who explored spiritualism, theosophy, and anthroposophy during her lifetime. Unlike her male contemporaries, af Klint worked on her abstract paintings in seclusion and never exhibited them. Instead of recognition, af Klint sought her work’s meaning from the spiritual “Higher Beings” that she claimed painted through her. From 1906 through 1915, af Klint painted one hundred ninety-three works for her series *The Paintings for the Temple*, which resulted from these divine interventions. Along with the series of paintings, af Klint planned for a spiraling temple to display them that would honor both the contents of the work and how they were created but was never able to build it. More than a hundred years after af Klint finished the series, the paintings found their true home along the walls of a spiraling temple. The exhibition *Paintings for the Future* at the Guggenheim Museum in New York City from October 2018 through April 2019 attracted more than 600,000 visitors, making it the most-visited show in the history of the museum, and the first major solo exhibit of af Klint’s work. Current scholars have acknowledged this coincidence but have not considered the possibility that the Guggenheim Museum was indirectly inspired by af Klint’s plans. This connection is evidenced by her journals, close examination of the paintings, and the relationship of spiritualist and art enthusiast Hilla Rebay to Mr. and Mrs. Guggenheim.

**Allegory of Masculinity: Bellini’s Feast of the Gods**
Deborah Moses (Mentor: Anne Muraoka)

*Ancient, Medieval, Renaissance and Baroque Art and Architecture*

Throughout its long and storied history, Giovanni Bellini’s mysterious *Feast of the Gods* has inspired interpretations as diverse as the collection of Roman gods pictured therein. It is generally accepted to be an illustration of a fable from Ovid’s *Fasti*, wherein Priapus attempts to assault the nymph Lotis and is interrupted by the braying of Silenus’ ass. Deeper interpretations vary, from a calendar of the year to quasi-mystical humanist instructions on the best time of year to conceive children. Unusual for a depiction of classical pagan gods, however, it is rarely discussed in the allegorical terms common to Roman mythology and folklore. In fact, there seems to be broad agreement that outside of Bacchus, Priapus, and Lotis, the gods being portrayed are nearly random and have no greater meaning than as characters filling out a crowd scene. A closer look, however, tells a different story. By studying the patron, Alfonso I d’Este, his influential sister the Marchesa of Mantua, Isabella d’Este, and their social circle we can see that the most prominent gods outside of the fable of Priapus - Jupiter, Mercury, Pluto, and Apollo – communicate the distinctly masculine traits and virtues that the patron, Alfonso I d’Este, may have seen in himself and wanted to be remembered as possessing.
Light in the Darkness: The Franciscan Influence on Caravaggio’s the Taking of Christ
Madeline Keller (Mentor: Dr. Anne Muraoka)

The 1602 Taking of Christ by the Italian Baroque painter Caravaggio captures the moment of Judas’s betrayal of Christ and its result, Christ’s arrest by the Roman soldiers. The canvas was only recently rediscovered in 1990 and it has surprisingly received very little in-depth scholarship. Art historians have centered primarily on the story of its rediscovery or on the identities of the figures in the painting and in particular the frightened figure behind Christ quickly exiting the scene. Scholarship has thus remained superficial and piecemeal. In 2016, Stefano Zuffi and Philip Cottrell briefly mentioned the Franciscan influence in Caravaggio’s Taking of Christ, both centering however only on the accepting and submissive countenance of Christ. The consideration of the popularity and influence of the founder of the Franciscan order, Saint Francis of Assisi, and the Franciscans before and during Caravaggio’s lifetime and its influence on the artist and the overall canvas has therefore been largely overlooked. This paper argues that the Franciscan order and Franciscan spirituality was a major influence in the Taking of Christ, beyond just that of Christ’s gesture and expression. By examining the unconventional pictorial devices Caravaggio utilized in his canvas against the backdrop of Franciscan spirituality, the canvas’s meaning and message of faith, as exemplified by Saint Francis of Assisi and the Franciscans, becomes powerfully clear.

Session II
10:15-11:15 AM (Learning Commons: Room 1310)
College of Sciences 2
Moderators: Hanna Twiddy & Fangling Zhu

Molecular Strain Typing of the Tick-Borne
Rebecca Ferrara (Mentor: Dr. David Gauthier)

Rickettsia parkeri is one of a group of bacteria that cause Spotted Fever Group Rickettsioses (SFGR) in humans. Spotted Fever Group Rickettsioses can cause fever, headaches, rashes, muscle aches, and an eschar and some, such as Rocky Mountain Spotted Fever (R. rickettsii) can be fatal. R. parkeri, which is transmitted to humans by the Gulf Coast Tick (Amblyomma maculatum), causes a milder SFGR. In its historic range along the US Gulf Coast and the southeastern US, R. parkeri has prevalence of 1-15% in A. maculatum. However, in the Tidewater region of Virginia, where A. maculatum is a recent invader, prevalence reaches 50-60%. One hypothesis for this disparity is that there are different strains of R. parkeri present in these separate areas. Previous studies have not been able to demonstrate strain variation in R. parkeri; however, most of these studies have only performed typing at single genes. In this work, we aim to identify additional genetic markers for strain typing of R. parkeri. To accomplish this goal, we performed comparative genomics on four complete R. parkeri genomes, locating variable regions between strains. This analysis yielded four viable primer sets for the strain typing of R. parkeri: dks-xerC, ubiD-poly3, autoH, and fol-hypo. These primer sets were then tested upon a group of A. maculatum found to be positive for R. parkeri, and the subsequent results make up a trainer set. Additionally, the primer sets were tested upon seven strains of R. parkeri given to us by the CDC.

Electrons for Neutrinos: Lepton Energy Reconstruction in the Resonance Excitation Region
Lucas Tracy (Mentor: Dr. Lawrence Weinstein)
A major area of research in nuclear/particle physics is the understanding of neutrino oscillations. The probability of measuring neutrinos to be in a particular state oscillates as they travel through space, and neutrino beam experiments are currently being run in an attempt to describe the nature of these oscillations. Neutrino beams cover a wide energy range, therefore a major obstacle for interpreting the results of these experiments is the determination of the incident neutrino energy. By using electron data with a known beam energy from the CLAS detector at the Thomas Jefferson National Accelerator Facility, and exploiting the leptonic similarities between electrons and neutrinos, we tested various techniques for determining the energies of incident leptons. We found that for events with only one electron, one proton, and one pion we could accurately reconstruct the energy only for negative pions. We were also only successful if we used information from all three particles. We will present data from various targets at beam energies of 2.2 and 4.4 GeV.

Calcification Responses to Mid- and End-Century Ocean Acidification Levels in the Stony Coral, Astrangia Poculata
Heather Sheffey (Mentor: Anna Tansik)
Marine Biology
Climate change stressors are becoming a growing concern with the rampant release of CO$_2$ in the atmosphere. The impact of extreme CO$_2$ concentrations on stony coral health is well researched, but it is necessary to develop research at more realistic CO$_2$ ppm values. Following RCP 6.0, laid out by the Intergovernmental Panel on Climate Change, we exposed three groups of the Northern Star Coral Astrangia poculata to 410 ppm, 500 ppm, and 800 ppm CO$_2$ for several months. The intention is to mimic present day, mid-century, and end-century OA levels, respectively, for several months in order to understand long term impacts on calcification. We also investigated the role of symbionts in resistance to OA by taking advantage of the facultative nature of Astrangia poculata. Calcification rates will be determined by using the Alkalinity Anomaly method under light and dark conditions for both symbiotic and asymbiotic corals during the experiment. This will allow us to understand the role of the algal symbiont in the coral’s success in acidified waters as the extent to which stony coral calcification will be impacted by OA can be greatly impacted by the concentration of algal symbionts. Corals subjected to higher levels of CO$_2$ displayed lower rates of calcification compared to present day conditions after only one month.

10:15-11:15 AM (Learning Commons: Room 1311)
College of Arts & Letters 3
Moderator: Alex Ehlert & Ren-Neasha Blake

A Lexical Analysis of Contemporary American White Nationalist Language
Bernadette Murphy (Mentor: Bridget Anderson)
English Language and Literature and Race, Ethnicity and Post-Colonial Studies
I conducted lexical analysis of contemporary American white nationalist language as part of a research team, People Educating Citizens Against Racism (PECAR), directed by Dr. Bridget Anderson. I was an analyst and project manager for a team of students that worked with a large corpus of Discord chat room language used to plan the deadly Unite the Right White Nationalist rally held in Charlottesville, Virginia in August 2017. The data includes colloquialisms, lexical items, and insider knowledge of White Nationalist groups. We built a lexicon, similar to a dictionary, to bring clarity and understanding to the unfamiliar words/terms that are found in Nazi language.
Lexical items include neologisms, or new words, such as “dindu,” used as a derogatory term for African Americans in reference to their dialect when saying “didn’t do nothing.” Some meanings of standard words have been newly specified, for example “bowlcut,” to describe a person who has committed/aspires to commit a racially motivated violent act who is inspired by Dylann Roof. The lexicon catalogues groups (e.g. Identity Evropa, Vanguard America, the Rise Above Movement (RAM), etc., slang (Chad: a way to describe a “pretty boy” or “typical white guy”, Jewing: synonymous with “messing up”), and derogatory terms (Mudslimes, Cotton Candy). The SPLC tracks over 1,000 hate groups across the nation. My paper presents an analysis of a contemporary Nazi lexicon and provides chilling evidence that hate groups are alive and well in our society today. The public deserves to be informed.

Recognizing Lexical Patterns that Arise in the Wake of White Nationalist Unrest
Pettie Perkins (Mentor: Bridget Anderson)

*English Language and Literature and Race, Ethnicity and Post-Colonial Studies*

Art played a key role in establishing power for ancient Egyptian royalty. Their art portrayed an idealized reality, with carefully formulated imagery that fit the needs of rulers to maintain order and substantiate their right to rule. The artifacts they left behind provide insight into their lives and customs, but is it possible to glean truth from imagery based in falsehoods? Ancient Egyptian women in power as queens and kings used various approaches to their portraiture to establish their positions as rulers by stepping away from the traditional formula with an intention to fit their individual needs and ambitions.

Tidewater Voices – Anthony Carnevale
Kevin Boyd (Mentor: Bridget Anderson)

*Literature in English*

This transcription offers the methods of studying Tidewater based american english by recording the conversation between a student and a Tidewater native. Transcription should include syntax and speech patterns of individual Tidewater dialect as well as their idiolect. In this Transcription it is found how the Tidewater dialect is developed in an individual whose first language was spanish and also influenced by a younger culture. The individual discusses a lot of their child-hood in tidewater and personal relationships. During the interview lexical features are expressed in the overuse of words such as “like” and “I don't know” which seems to appear with the younger generation of speakers, relying on words and phrases such as these to assist them through their conversations. A large amount of Tidewater english is displayed in an older generation but with the internet and television affecting the speech of youth this recording displays the growth and evolution of the dialect. Tidewater english is a growing study of American English because of the vast variety in it. This transcription of the Tidewater dialect shows the area has a large variation in its population from examples like, Norfolk and Virginia Beach to Yorktown and Guinea Virginia and the huge differences in the dialects. The range has a large phonological variation and recordings such as this add to the vast intrigue within the linguistic community of the Tidewater dialect. This is a part of Tidewater Voices, Directed by Bridget Anderson.
Ancient Egyptian “condemnation of memory,” iconoclasm or damnatio memoriae
Madeline Keller (Mentor: Jared Benton)
History of Art Architecture, and Archaeology
This paper focuses on the reasons and contemporary consequences of ancient Egyptian “condemnation of memory,” better known as iconoclasm and, in some cases, damnatio memoriae. Most scholarship focuses on ancient Egyptian iconoclasm as an act of political or social erasure. For example, Tuthmosis III’s attempted erasure of Hatshepsut, as a way to make it seem as though he never had a regent and as trying to take credit for all of her accomplishments. The ancient Egyptians were a highly religious people, with religion woven into every aspect of their lives. It is an oversight not to remember such religiosity when examining their iconoclastic habits. This paper argues that iconoclasm, when seen in Egyptian contexts, was a spiritual act. The primary goal of Egyptian iconoclasts was suffering in, or removal from, the afterlife. All other politico-historical benefits came second. By examining the acts of iconoclasm following the reign of Akhenaten and the Amarna period and the epigraphy from the mortuary complex of Hatshepsut and the erasure of the female King’s name we find that iconoclasts targeted names and faces, as though ritually attacking their personal identity as an effort to deprive them of eternity.

Criticism Through Interpretation: Jules Olitski
Brooke Benham (Mentor: Vittorio Colaizzi)
Contemporary Art and Theory and Criticism
Modernist art critics tend to focus solely on formal elements. Clement Greenberg’s descriptive approach on the medium and Jerry Saltz’s off-the-cuff judgements fail to utilize the relevant insight that can be collected through cognizant interpretation. Susan Sontag attempts to justify the medium-specific approach by arguing that the merit of a work of art is independent of any interpretation. However, an interpretation based on historical and cultural connections can produce valuable insights about the form itself. A research-based analysis of Kristina Type 3 (1976) by the late-modernist painter Jules Olitski will show that criticism can serve viewers best through knowledgeable interpretation. This approach supplements an exclusive focus on either description or judgement of form without disregarding their mutual importance. An understanding of the political events in Olitski’s past allows the viewer to better understand the implication of freedom used in his unorthodox pictorial construction.

Getting to Know You: Medieval Understanding of the Corporeal Self through the Garden
Sarah Bulger (Mentor: Agnieszka Whelan)
Ancient, Medieval, Renaissance and Baroque Art and Architecture
The body as an object of analysis is often underrepresented in medieval studies, attributable to its equal underrepresentation in the corpus of medieval literature. The body was viewed as a microcosm of the universe in the Middle Ages, understandable through the application of nature and the sciences to its various functions. The medieval garden too was a microcosmic representation of the sacred and secular worlds, as utilitarian or pleasure gardens respectively, representing the macrocosm of nature. Modern scholars have compiled from medieval works the information existing on how human bodies were understood medically and metaphysically, but have not ventured into what visual, tangible representations were employed to supplement the
understanding of the body as a whole. Through assessments of the four elements as represented in the medieval garden, writings on the four humors, and medieval medical science, the stylistic designs of gardens are found to be a conceptual tool for the medieval comprehension of the corporeal self. From the physician Galen to the Roman de la Rose and the philosopher’s stone, the medieval garden was a conduit for comprehending one’s bodily functions and physical self in secular and sacred contexts.

Love and Landscapes: Titian’s Sacred and Profane Love, as a Lesson for the Bride
Ireland O’Hare (Mentor: Anne Muraoka)
Ancient, Medieval, Renaissance and Baroque Art and Architecture

Titian painted the mystifying Sacred and Profane Love in 1514 and its intended message is still disputed among scholars. The controversy primarily lies in the question of whether the two frontal subjects in the painting represent twin Venus’ as conceptualized by Plato or if the scene depicts a “lesson for the bride” scenario with the bride, Laura Bagarotto, on the left and Venus on the right. Despite establishing the women as twin Venuses, the intended message remains inconclusive until thorough analyzation of the iconographical clues dispersed throughout the painting is conducted. This paper seeks to disclose the intended meaning of the painting by making connections in the artist’s early works through the reoccurring buildings in the landscapes that he adopted from his friend and mentor, Giorgione. This landscape motif was established during Titian’s completion of Giorgione’s Sleeping Venus with its final debut emerging in Sacred and Profane Love to represent the artist’s ultimate separation from his mentor whilst simultaneously communicating a message of faith and love within the marital painting.

10:15-11:15 AM (Learning Commons: Room 1313)
College of Arts & Letters 5
Moderators: Annette Finley-Croswhite & Taiwo Oguntuyo

Measles and the Anti-Vaccine Movement
Benjamin Legere (Mentor: Annette Finley-Croswhite)
Medical Humanities

For most of the public, measles is thought of as a historical disease that causes few problems today or is tied to a warning by one’s pediatrician. Measles was cured with a vaccine long ago. However, due Andrew Wakefield’s 1998 flawed scientific study of the MMR vaccine in The Lancet and subsequent social-media driven dissemination of information about the “link” between the Measles Mumps Rubella (MMR) Vaccine and Autism Spectrum Disorder, the anti-vaccination movement has been bolstered in contemporary society. The subsequent anti-vaccine movement is not satisfied with only attacking the MMR vaccine, moreover, but now denounces all types of vaccination. The result is a major public health problem. This paper connects Wakefield’s work with contemporary anti-vaccine views, which have played a significant role in increased rates of measles outbreaks today. A discussion on the growing influence of social media in the anti-vaccine movement will also be discussed. The history, signs and symptoms, treatment modalities, and epidemiological information of measles will be given.
The Impact of Religion on the Eradication of Leprosy
Brieanna Bullaro (Mentor: Annette Finley-Croswhite)

_Bacterial Infections and Mycoses_

Leprosy is a disease that has, unfortunately, stood the test of time. With an astounding rate of immunity worldwide, and the availability of therapy that can both prevent and cure the disease, the questions stands: why has it not been eradicated? In this paper, the definition, history, treatment, and changing social perception of leprosy will be examined. While multiple religions will be discussed, an emphasis will be placed on the relationship between Christianity and leprosy. The paper will conclude by hypothesizing that the stigma attached to the disease via historic religious texts has prevented the eradication of leprosy.

The Epidemiology and Historical Effects of Typhus
Tyler Zawislak (Mentor: Annette Finley-Croswhite)

_History of Science, Technology, and Medicine_

Typhus is now a rare disease, but it was once one of the deadliest epidemics faced by humanity throughout its evolution. Through review of historical warfare information from the 1500’s to present-day, historical medical writings, scholarly articles regarding Epidemic Typhus, and written accounts from epidemic outbreaks, this paper will detail the Epidemiology of Typhus and elaborate on its historical impact. The high mortality rate of Typhus is known, but what is less known about the disease is its incidental impact on human history; specifically, its effects on historical wars such as the Napoleonic Wars, World War 1, and other historical battles due to the proclivity of Epidemic Typhus to follow armies; how Typhus resulted in sweeping medical and prison reforms after the late 1500’s by helping show disease transmission and sanitary effects; and finally, how Typhus, after being observed by an early scientist named Francastoro, helped lay the foundations for the modern day Germ Theory. Today, modern medicine has created a vaccine for Typhus, making infection rare and epidemic outbreaks even more so. However, research is still ongoing to discover the origins of Epidemic Typhus, and further detail its influences throughout modern evolution.

Alzheimer’s the Epidemic Many Haven’t Thought About
Jaden Edmonds (Mentor: Annette Finley-Croswhite)

_Nervous System Diseases_

Alzheimer’s disease is a progressive, degenerative disease that attacks and kills neurons causing the brain to shrink. This process slowly in stages robs a person of their ability to think, plan, express themselves, and eventually take care of themselves. Millions of people across the world suffer from this disease for which there is no cure; and worse this number is rising quickly every year. The specific cause(s) for this disease is still unknown. However, scientists have pointed two key proteins (named beta-amyloid and tau) that play a big role in causing the neurons to die. It was discovered in 1906 by a German physician named Dr. Alois Alzheimer, it was named after him 4 years later. Awareness of Alzheimer’s has exponentially increased since its discovery and unfortunately so has the number of people worldwide it kills. “Currently 1 of out of 3 seniors will die of complications with Alzheimer’s or another type of Dementia; it kills more than breast and prostate cancer combined” (Facts and Figures, n.d.). This number will only get higher given time, especially with the population rising, and the only to prevent is to focus even more on finding a cure. We must build upon the framework started by former presidents Barack Obama and Ronald Reagan, great scientists like Dr. Katzman and spread awareness so one day a Dementia diagnosis won’t carry so much weight.
The Power of Non-Gender Specific Imagery: An Analysis of Eighteenth-Dynasty Egyptian Iconography and the Use of Androgyny
Avery Bolden (Mentor: Jared Benton)

Ancient, Medieval, Renaissance and Baroque Art and Architecture

The Power of Non-Gender Specific Imagery: An Analysis of Eighteenth-Dynasty Egyptian Iconography and the use of Androgyny to Propagate Power and Right to Rule

New political realities during the New Kingdom forced corresponding changes in the gendering of traditional leadership roles. Eighteenth-dynasty kings and queens were depicted in ways that departed from traditional gendering of Egyptian political offices, for example Hatshepsut is shown feminine, challenging the maleness of kingship, and Akhenaten is depicted in ways that obscure his gender. Previous scholarship has tended to view the use of androgyny and femininity by eighteenth-dynasty kings as separate phenomena grounded in the individual and distinct political needs of each ruler. I propose that such challenges to traditional gendering of power in Egyptian society were all part of a single phenomenon endemic to the eighteenth dynasty. For the royal family, androgyny was used to connect kings to the divine. Kristina Hilliard observes that the iconography of Egyptian female kings presented a form of distinctly female power. Hilliard overlooks, however, the fact the evoking gender in flexible ways was used by both male and female rulers in the eighteenth dynasty. A focus exclusively on female kings and rulers neglects the family ties that coursed through the eighteenth dynasty and that surely played a role in how kings of that period chose to present their gender. Androgyny, specifically, served as a way to link them to the divine. In Hatshepsut’s case, androgyny visually linked her to Horus, who is male and critical to Egyptian Kingship. For Akhenaten, androgyny strengthened his own connection to the Aten, a genderless deity. In both cases, these connections reinforced the kings’ right to rule.

It’s Elementary: The Bayeux Tapestry as a Medieval Educational Tool
Sarah Bulger (Mentor: Anne Muraoka)

Ancient, Medieval, Renaissance and Baroque Art and Architecture

The Bayeux Tapestry has baffled historians resulting in diverse scholarship since its rediscovery in the eighteenth century. Long-standing assumptions about the Bayeux Tapestry’s commission, production, and purpose have accumulated through the years based on a single inventory document from 1476 which postulates its intended location and function as a religious ornament for Bayeux Cathedral, leading many scholars to assume the patron had been Odo, Bishop of Bayeux.[i] Scholars have gleaned from the Tapestry’s diverse scenes features of Anglo-Norman life which have been explored by modern academics attempting to interpret them, but a relationship between the Bayeux Tapestry and its utility in Anglo-Norman England cannot yet be accurately constructed. Due to the lack of contemporary documents relative to the Tapestry, the approach taken by scholars in an effort to retell its story remains fixed in the idea that the Bishop of Bayeux commissioned it to serve as an ecclesiastical decoration. Thus, room for new ideas regarding the nature of the Bayeux Tapestry have been stifled. Through comprehensive examinations of medieval noblewomen’s prominent roles in society, Anglo-Saxon traditions in education, and the functions of fables and humor as depicted in the embroidery friezes, the Bayeux Tapestry is revealed as indisputably a didactic tool for eleventh-century Anglo-Norman
education, thus constructing a new narrative for the Tapestry as undeniably instructive rather than decorative.

**Leda and Mary: Two Women, Two Worlds, One Story**
Kayla Everett (Mentor: Dr. Anne Muraoka)
*Comparative Methodologies and Theories*

Leda and the Swan was a very popular subject amongst Italian Renaissance artists, including Antonio Allegri da Correggio and Leonardo da Vinci. The pagan story and the paintings associated with it have long been looked at as a response to a passage in Ovid’s *Metamorphoses*. Some scholars have shined a negative light on these sumptuous images, relating them and the pagan story to rape, even though the images by both Correggio and Leonardo do not exude fear. Instead, both artists evoke a welcoming and loving spirit within their paintings. Scholars have not considered the historical context of these images, and the fact that many artists, humanists and clerics were looking at pagan images and stories through a Christian lens. As a result of this neglect in context, rape has been at the forefront of many scholarly interpretations. This paper argues that the renditions of the story of Leda and the Swan, created by Correggio and Leonardo, were not showing a story of rape, but rather an allusion to the exemplary nature of the women as paralleled with the Virgin Mary and their roles as mothers of children who shaped both the pagan and Christian worlds.

**The Saint of Sex and Sorrow: Mary Magdalene’s Unique Identity in Penitent Magdalene**
Ireland O’Hare (Mentor: Anne Muraoka)
*Ancient, Medieval, Renaissance and Baroque Art and Architecture*

Despite being produced early in his career in 1594, Caravaggio’s *Penitent Magdalene* represents one of the most complex interpretations of Saint Mary Magdalene. It is especially profound when compared to renditions prior to Caravaggio’s which typically portray the Magdalene in ways that emphasize her supposed former life as a prostitute or her life after conversion as a haggard hermit. However, Caravaggio’s interpretation of the saint does not lie within either of these exaggerated themes thus calling into question the intended purpose of the painting. The discrepancy surrounding the Magdalene’s identity can be attributed to Pope Gregory the Great who merged Mary Magdalene with other women from the Gospels including “Luke’s sinner” which established her as a prostitute. Despite the inconsistencies in her story, the subject was suitable for the period as prostitution was a major part of society during Caravaggio’s time in Rome. This paper determines that Caravaggio’s *Penitent Magdalene* exhibits his early wisdom as he sought to incorporate the social issues surrounding the heightened presence of prostitution in sixteenth and seventeenth century Rome into a particularly emotive religious painting of Saint Mary Magdalene that enables the viewer to resonate with the humanity of the saint more so than prior renditions.
What is LeADERS?

LeADERS is an Academic Experience, Professional Development, and Recognition Program.

**Academic Experience:** Students are encouraged to select courses in their degree program that are interactive, hands-on, and practical. This includes Leadership, Academic Internship, Diversity, Entrepreneurship, Research, and Service Learning classes and experiences.

**Professional Development:** Students complete a LeADERS ePortfolio to reflect on and showcase their learning and real-world skills developed from coursework and other experiences. Students also enjoy perks, such as priority access to career fairs, individualized and group ePortfolio support, and other events held exclusively for LeADERS Candidates.

**Recognition Program:** Students who complete their LeADERS ePortfolio and courses from three, four, or five different class areas of LeADERS earn bronze, silver, or gold LeADERS medals to wear during commencement. Students are presented with a LeADERS certificate and medal during a special ceremony, and they receive a transcript designation for their LeADERS experience.

Research shows that students who participate in these types of high-impact learning experiences (e.g., ePortfolio, internships, service learning) are more likely to be academically successful, feel a stronger sense of belonging at their university, and have better connections with peers and faculty members. LeADERS also helps students strengthen and showcase skills that employers and graduate programs are seeking, such as teamwork, problem solving, and communication.

Why join LeADERS?

Any undergraduate ODU student can join by completing a short LeADERS Student Interest Form located at [www.odu.edu/leaders](http://www.odu.edu/leaders).

How to join LeADERS?
Q: How do I apply for admission to the Perry Honors College?
A: Please use the online application at [https://www.odu.edu/honors/about/apply](https://www.odu.edu/honors/about/apply). You will be asked to submit an essay online and to provide information about class rank, GPA, SAT or ACT scores. We also need a letter of academic support from an instructor or teacher attesting to your academic abilities. All letters should be emailed to Tanya McCown at perryhonorscollege@odu.edu. (Application Deadlines: Fall/Feb 1st and Spring/November 1st)

Q: When is the best time to apply to the Perry Honors College?
A: You can apply now. Please log onto [https://www.odu.edu/honors/about/apply](https://www.odu.edu/honors/about/apply) to fill out and submit the Perry Honors College application. Decisions regarding fall are presented February 15th and on the 15th of every month after.

Q: How does ODU's new "Test Optional" program affect my Perry Honors College application?
A: The "Test Optional" program allows high school students with at least a 3.3 GPA in a rigorous, college preparatory curriculum seeking first-time entry to the university the option to be considered for admission without regard to SAT or ACT results. If you use the "Test Optional" program to gain admittance to ODU, you must submit your SAT or ACT scores to the Perry Honors College for your application to be considered. You may submit a scanned copy or PDF of your scores showing your full name and all scores to perryhonorscollege@odu.edu to complete your application.

Q: Are there minimum requirements for admission to the Perry Honors College?
A: The typical high school student applying for the Perry Honors College ranks in the top 10% of her/her graduating class, has 1200 SAT combined math & verbal score or a 27 on the ACT Composite, and 3.5 or greater high school GPA. Transfer students must have at least a 3.5 college GPA.

Q: For the 3.5 high school GPA, is that weighted or unweighted?
A: It does not matter if your GPA is weighted or unweighted.

Q: How will I know if I am admitted to the Honors Program?
A: All correspondence, including acceptance or denial letters, from the Perry Honors College will be done through email. For current ODU students, all correspondence will go to your ODU account. For transfer and incoming first-year students, the email will be sent to the email address on your application.

Q: Are honors courses harder and will they take up much of my study time?
A: Not necessarily. Honors instructors have been challenged to make courses more enriching. Significant reductions in class size allow for more interaction with faculty and among students; collaborative projects, civic learning, and research-based activities are encouraged. Also, Honors courses tend to be faster paced and more intellectually challenging, but they should not require significantly more time than non-honors courses.

Q: Am I automatically enrolled in the Perry Honors College on the basis of SAT scores, ACT scores, GPA, awards, or scholarships?
A: None of these guarantee admissions to the Perry Honors College. You must apply.

Q: As an Honors College student, will I take more classes than other students?
A: Yes and No.
The general education requirements for honors students are the same as for other students; the only difference is that Perry Honors College students are required to use at least four honors courses to meet these requirements.

Perry Honors College students will also transform two upper-level courses (often required in their major) into "Honors Contract Courses." These courses provide planned opportunities for the student to meet with the instructor to review, discuss, and revise the honors course assignments/components, which are often done as an alternative to some or all of the regular course assignments.

In addition, Perry Honors College students are required to complete a one-credit civic learning project (HNRS 387) and a senior capstone course (HNRS 487) in order to enhance their academic portfolio in preparation for graduate school or a profession. If the tuition for HNRS 387 and HNRS 487 is not already covered by a scholarship, the Perry Honors College will cover the tuition costs for these two classes.

Q: How do I apply to reside in the honors housing?
A: You will select honors housing as a preference when you apply for university housing using the online application available on the webpage for the Office of Housing and Residential Life. Note: honors housing is assigned according to the date the housing application and deposit are received online by the Office of Housing and Residential Life.

Q: If I submit my Perry Honors College contract, am I required to attend ODU?
A: No. The Perry Honors College contract is not binding. We use that contract as a way to determine how many people may be in the Perry Honors College. Also, acceptance to the Perry Honors College does not confirm enrollment at ODU; the Office of Admissions must be contacted to confirm enrollment. You can always cancel your Honors contract with us by emailing us at perryhonorscollege@odu.edu or calling 757-683-4865.
2020 Undergraduate Conference Travel Grants

Now Accepting Applications: Travel Must Occur by June 30, 2020

The SEES Undergraduate Student Travel Award was established to support undergraduate students’ travel to local, regional, national and international conferences sponsored by professional organizations for the purpose of reporting the results of their research, exhibiting or performing creative works, disseminating results of their scholarly activity, or attending in order to further their education. (http://www.odu.edu/studentinvolvment/travel)

2020 Summer and Fall Undergraduate Research and Creativity Grants

SUMMER Application deadline: March 15, 2020
FALL Application deadline: April 1, 2020

This program provides students with an opportunity to pursue original research, scholarship, or creative work under the mentorship of a full-time faculty member. Open to Juniors and Seniors with a minimum cumulative GPA of 3.25, the award provides a $3,000 Summer/$2,000 Fall stipend for one semester. $500 may be used for faculty member stipend (https://www.odu.edu/honors/research/funding)

Undergraduate Research Honors Scholar (URHS) Program

Registering for the Undergraduate Research Honors Scholar Program (URHS) is the first step to receiving information about undergraduate research funding, research opportunities, and other research-related resources. Registered students are also able to apply for essential supply and equipment grants to offset the costs of their URHS activities (https://www.odu.edu/honors/research/urhs)

2020 Essential Supplies/Equipment Supplies/Equipment Grants for Perry Honors College Students

Perry Honors College students may apply for up to $300 to offset the costs of equipment and supplies for the completion of research related to a research apprenticeship, honors contract course, or a senior honor thesis/project.