



# 29<sup>th</sup> Radford University Student Engagement Forum

April 20<sup>th</sup>-24<sup>th</sup>, 2020

<https://tinyurl.com/RUSEF>

**RADFORD UNIVERSITY**  
Office of Undergraduate Research and Scholarship

*Student Engagement Forum Coordinators*

**Joe Wirgau, OURS Director**

**Maggie Pate, OURS Associate Director**

*The following individuals and officers are acknowledged for their contributions:*

**Norma Riggins, University Services Event Planning Manager**

**Samantha Blevins, CITL Instructional Designer and Learning Architect**

**Jean Mistele, Citizen-Leader Co-Director**

**Jessica Twiest, Citizen-Leader Co-Director**

**Breyanna Guadarrama, OURS Graduate Assistant**

**Zoe Millard, OURS Graduate Assistant**

**Sierra Felty, OURS Executive Student Assistant**

**Jillian Rauch, OURS Executive Student Assistant**

**Samantha Doncaster, OURS Executive Student Assistant**

*The cover art is the creation of Jillian Rauch, an Allied Health Sciences major at Radford University*

**Artist Statement:** There are an infinite amount of ways for people to express themselves. Whether it is painting, writing, dancing, or even research – we are able to delve into the minds of others and discover new things about the world and the people in it. My time working in the Office of Undergraduate Research and Scholarship (OURS) allowed me to learn so much about Radford's students, as well as myself. I walked into OURS every day never knowing what exciting project I would be completing or assisting with next. One day, Dr. Wirgau asked me to update some flyers for the student research programs offered by OURS. I had zero experience in cover art, working with picture files, or any sort of advertising etc. So, initially I was intimidated by the task, but I soon learned how much fun I would have designing flyers and creating cover art for OURS. Not only was I able to express myself, I was able to share with the university the environment within OURS created by the wonderful people there who work so hard to make it what it is today. OURS is a place of inspiration, discovery, excitement, and support. I have never flourished more than I did while working in the Office of Undergraduate Research and Scholarship and I have the people who work there to thank for that. The art that I have created is a memento of the relationships I have created, the people I have met, and the skills that I have gained while working in OURS. My hope for anyone reading this is that you become inspired by what you learn and see today, and carry it with you as you tackle the rest of your education here at Radford and into your career. A special thanks to Dr. Wirgau for inspiring me and being such a supportive, reliable role model to me during my time at Radford.

# 29<sup>th</sup> Annual Radford University Student Engagement Forum

## SCHEDULE AT A GLANCE

This being a new experience for almost all of our presenters and audience members we wanted to provide a quick overview to help make the most of your experience. Many of the presentations are open to the public and can be found on April 21<sup>st</sup> at <https://tinyurl.com/RUSEF>. In compliance with the IRB, some presentations require that you login in to Portfolium before viewing the presentation. All those with Radford email accounts have access to Portfolium and directions on how to [activate your account can be found here](#).

We encourage audience members to view and interact with presentations from April 21<sup>st</sup> through the 24<sup>th</sup>. At the bottom of each presentation is an “add a comment” box and we are asking that people leave questions there. All authors will receive an email notifying them that they have received a comment, we hope this will create a rich virtual conversation between presenters and members of the audience.

Specific topics and sessions have been created within the larger conference. These can be navigated through the Portfolium “Tag” system. On the right side of each presentation are “Tags”, if you click on one it will bring you to the group of presentations co-listed there. Individual Tags are listed on the schedule at a glance on the next page for direct access.

### **Citizen-Leader Showcase:**

April 20<sup>th</sup> at noon Erin Vernon, 3 pm Noelle Abbott, and Emily Hanson at 5 pm will be sharing their experiences as part of the Citizen-Leader program through Zoom which can accessed by joining 942-398-4360; Password 641514 or clicking:

<https://radford.zoom.us/j/94239834360?pwd=SWFmd05sVk5jbkwyaUFHUVFKN2pJUT09>

### **All Presentations April 21<sup>st</sup> through April 24<sup>th</sup>**

<https://portfolium.com/discover/tag/RUSEF2020> (#RUSEF2020)

#### **4<sup>th</sup> Annual Production Technology Showcase**

<https://portfolium.com/entry/2020-production-technology-showcase>

#### **Accelerated Research Opportunities (ARO) Living Learning Community**

<https://portfolium.com/discover/tag/RUSEFARO> (#RUSEFARO)

#### **Arctic Geophysics Student Research**

<https://portfolium.com/discover/tag/RUSEFArctic> (#RUSEFArctic)

#### **Art Showcase**

<https://portfolium.com/discover/tag/RUSEFArt> (#RUSEFArt)

#### **Artis College Research**

<https://portfolium.com/discover/tag/RUSEFArtis> (#RUSEFArtis)

#### **Biology Research**

<https://portfolium.com/discover/tag/RUSEFBIOL> (#RUSEFBIOL)

#### **Chemistry Research**

<https://portfolium.com/discover/tag/RUSEFCHEM> (#RUSEFCHEM)

#### **Citizen-Leader Showcase**

<https://portfolium.com/discover/tag/RUSEFC-L> (#RUSEFC-L)

**College of Humanities and Behavioral Sciences Showcase**

<https://portfolium.com/discover/tag/RUSEFCHBS> (#RUSEFCHBS)

**College of Visual and Performing Arts Showcase**

<https://portfolium.com/discover/tag/RUSEFCVPA> (#RUSEFCVPA)

**Criminal Justice Research**

<https://portfolium.com/discover/tag/RUSEFCRJU> (#RUSEFCRJU)

**Digital Media Showcase**

<https://portfolium.com/discover/tag/RUSEFDMS> (#RUSEFDMS)

**Geospatial Research**

<https://portfolium.com/discover/tag/RUSEFDGEOS> (#RUSEFDGEOS)

**Health and Human Performance Research**

<https://portfolium.com/discover/tag/RUSEFDHHP> (#RUSEFDHHP)

**Highlander Research Rookies**

<https://portfolium.com/discover/tag/RUSEFHRR> (#RUSEFHRR)

**Psychology Research**

<https://portfolium.com/discover/tag/RUSEFPSYC> (#RUSEFPSYC)

**Spring BFA Show**

<https://portfolium.com/entry/radford-university-bfa-show>

**Waldron College of Health and Human Services Research**

<https://portfolium.com/discover/tag/RUSEFWaldronRUC> (#RUSEFWaldronRUC)

## Welcome

On behalf of the Office of Undergraduate Research & Scholarship, it is my pleasure to welcome you to the 29<sup>th</sup> Radford University Student Engagement Forum and the first Virtual Student Engagement Forum! Nearly two hundred students will be presenting their original research, scholarship and creative activities April 20<sup>th</sup> through the 24<sup>th</sup> on Portfolium.

I am routinely impressed and excited about the projects that occur across Radford University and Radford University Carillion, but this spring amid an unprecedented global pandemic it is nothing short of awe inspiring to see 70 faculty and over 180 students not only be able to remotely complete but also prepare and deliver presentations of original research, scholarship, and creative activities. It is just one of many examples of Highlanders rising to meet this and every occasion thrown their way.

I tell everyone I have the best job on campus and a major reason for that is the truly remarkable team I get to work with at OURS. Although I will miss the chance to bond face to face over pushing tripods, poster backers, and snacks across campus all week, I am glad we have one more major event to take on as a team. It has been a pleasure to see Maggie Pate grow into a leadership role on campus as the Associate Director of OURS and I encourage you to make it a point to meet her, as I am confident she will positively impact Radford University in the coming years. Our trio of undergraduates Sam Doncaster, Jillian Rauch, and Sierra Felty are each in their own way inspirations to everyone else in the office. We are blessed with the good nature and dependable quality work of our GAs Zoe Millard and Breyanna Guadarrama. I would not be as successful in this role or as a teacher or administrator without the constant support, guidance, and push for continual reflection and growth provided me by Dr. Jeanne Mekolichick. I can honestly say I enjoy coming to the office every day, it is full of intelligent, interesting, caring professionals who find a way to keep working with a smile and laugh even on the most stressful days.

Enjoy the celebration of new knowledge and I hope to see you all face to face next year for the 30<sup>th</sup> version of the Student Engagement Forum!

Dr. Joe Wirgau

Director, Office of Undergraduate Research & Scholarship (OURS)

### Production Technology Showcase

The School of Communication proudly presents the 4<sup>th</sup> Annual Production Technology Showcase containing some of the best video and audio work of the year.

<https://portfolium.com/entry/2020-production-technology-showcase>

Student Presenters:	Jonathan Bess	Tyler Catron	Austun Cherry
	Andrew Cowdrick	Daniel Meaney	Christiana Niosi
	Brooke Parish	Jasmine Rorrer	Maya Smalls
	John Steinbach		

### Citizen-Leader Showcase

The Citizen-Leader Showcase will occur at set times on Monday April 20<sup>th</sup>. All other presentations will occur asynchronously from April 21<sup>st</sup> through April 24<sup>th</sup>. To access the Citizen-Leader Showcase use the link below or manually enter the ID and password to Zoom.

<https://radford.zoom.us/j/94239834360?pwd=SWFmd05sVk5jbkwyUjU09>

Enter Meeting ID 94239834360      Password: 641514

**12:00 pm April 20<sup>th</sup>      Citizen-Leader: Erin Vernon**

**3:00 pm April 20<sup>th</sup>      Citizen-Leader: Noelle Abbott**

**5:00 pm April 20<sup>th</sup>      Citizen-Leader: Emily Hansen**

Citizen Leader has allowed me to succeed as a civically active and engaged leader in my community. Also, through this program my academic path was one that was authentic, inclusive, and individualized. Citizen leader has allowed me to be involved in many on and off-campus events through some of the organizations that I am involved in such as the Honors College, Student Nurses Organization, Children's Miracle Network, and more. I have fostered many great friendships, personal, and professional connections that have allowed me to grow in my career path. I was able to work with those on campus and in the community to provide for those who are more vulnerable, allow children to learn about college options, allow future students to learn about the world of nursing, and provide opportunities for further growth in the City of Radford, Virginia. I was able to work with individuals from all disciplines to create a wonderful environment for the community we serve as leaders, caregivers, educators, and more. Likewise, I was able to make professional connections that allow me to showcase my unique and authentic workforce-ready and community-benefiting skills. This portfolio is not of only my work, but it is the work of my peers, my professors, my directors, and my fellow companions in the community. This portfolio includes examples of events I have attended to further my academic and professional growth, activities that I have completed, courses that have allowed me to do extra projects in to engage myself in my education, and one immersive experience. Citizen leader has allowed me to grow as an individual, but this organization has also allowed me to grow in the community that I serve.

All Presentations**Rejection to Riches: Using Rejection Based Decision Making to Improve Financial Wellbeing**

Student Presenter(s): Courtenay Kaplan

Faculty Mentor(s): Jane Machin

A thorough and working knowledge of financial decision making is crucial in one's life, as one decision can affect many other aspects of their life. Not only does having a strong financial literacy help you with avoiding risks, but it also allows you to take advantage of opportunities (Miller, Reichelstein, Salas and Zia, 2015). This paper attempts to uncover how much someone weighs the options they reject versus the options they select.

There is an ongoing research process for consumer behavior, specifically, the decision-making process of consumers. Decision strategy is the process used to make a choice (Shafir, 1993). A rejection-based decision strategy occurs when the primary focus of the decision is on rejecting undesired product attributes or option(s). A selection-based decision strategy occurs when the primary focus of the decision is on selecting desired attributes or option(s). (Machin, 2016). Selection and rejection are not complementary strategies (Shafir, 1993). Of particular relevance here is research showing rejecters give greater weight to negative information when reaching their decision, while selectors prioritize positive information (Meloy and Russo 2004). Neglecting negative information in financial decisions can have devastating consequences (Machin, 2016). If we were to ask, "what do I not want?" rather than "what do I want?" may influence whether they make better financial decisions.

By analyzing the way consumers approach decisions by their decision strategy, it can shed light to how framing the options can affect their memory of their desired choice. This may help marketers influence consumers future consumption of the product.

Three studies in different financial scenarios test the hypothesis that, relative to selectors, rejecters will attend more to negative information, helping them make more informed choices. Specifically,

- When choosing between loan options, rejecter will be more likely notice negative alternatives like the paying more for each monthly payment;

- when choosing a credit card, rejecters will be more likely to focus on negative information (e.g. fees), and thus more likely to choose a card better for their financial health;

- when considering an impulse purchase, rejecters will be more likely to identify the negatives of purchasing an unplanned item and thus more likely to avoid the frivolous spending.

**Accelerated Research Opportunities (ARO) Living Learning Community****A Birds Eye View: The Benefits of Trees for a Mid-Sized University**

Student Presenter(s): Sierra Felty                      Elise Simmons                      Eloni Hull

Faculty Mentor(s): Christine Small

Trees are critical to ecosystems and society, providing habitat for wildlife, offsetting CO<sub>2</sub> emissions, and contributing to energy savings and improved air quality. There are nearly 90 species and more than 1,000 individual trees on the Radford University campus. As our university continues to grow, it is imperative that we consider the value of our trees and potential species loss. A major goal of our research is to calculate economic and environmental benefits of campus trees and help to prioritize trees during construction planning. We used the i-Tree Benefit Calculator to estimate benefits for more than 100 trees on central campus. For example, Osage Orange has a circumference of 18.25 ft. Based on its size, sun exposure, and proximity to buildings, i-Tree estimates it has stored nearly 140,000 lbs of CO<sub>2</sub> during its lifetime, an ecosystem service valued at \$3,230. This tool also estimates the tree's effects on stormwater runoff, removal of air pollutants, and energy and fuel savings. A second goal of our research is to document national and state champion trees, the biggest trees of their species. Fifteen species were identified as potential state champions, including the Blue Spruce (*Picea pungens*) and Katsura Tree (*Cercidiphyllum japonicum*). Our results highlight the importance of campus trees and nominate potential state champions, raising awareness and respect for their value among the campus community.

**Accelerated Research Opportunities (ARO) Living Learning Community****Temperature Dependent Stabilities of the C<sub>44</sub> and K@C<sub>44</sub> Ca@C<sub>44</sub> and Sc@C<sub>44</sub> Endohedral Metallofullerene Isomeric Set**

Student Presenter(s): Evan Wood

Faculty Mentor(s): Timothy Fuhrer

Since their discovery in 1985, Fullerenes have been an intriguing subject due to their structure and varying stabilities and potential use in medical and energy research. Fullerenes with less than 60 carbon atoms are especially interesting due to their violation of the Isolated Pentagon Rule. In our current project, we investigate the temperature dependent thermodynamic stabilities of the C<sub>44</sub>, K@C<sub>44</sub>, Ca@C<sub>44</sub>, and Sc@C<sub>44</sub> isomeric sets as computed at temperatures ranging from 298 K to 6000 K, using Density Functional Theory (B3LYP/6-31G(d)) for geometry optimization and frequency calculations. Data from the computations are evaluated using statistical thermodynamics formulas to show the relation between mole fraction and temperature for every isomer of C<sub>44</sub>. Different graphs of metallofullerenes allows for an understanding of the influence of charge on the stability C<sub>44</sub> for varying isomers. This information is used to determine the most stable isomer of C<sub>44</sub> at any temperature which will allow experimental chemists to more easily characterize C<sub>44</sub> isomers they find in very small amounts in their plasma-arc soot.

**Accelerated Research Opportunities (ARO) Living Learning Community****Determining Participation in Undergraduate Research Experiences and the Associated Impact on the University**

Student Presenter(s): Samantha Doncaster

Faculty Mentor(s): Joe Wirgau Maggie Pate

There is significant research into the impact of participation in research, scholarship, and creative activities (URSCA), however, it remains a challenge for individual universities to capture these experiences on their respective campuses. The benefits to the university are increased student GPA, retention, progression, graduation rates, and continuation into graduate degree programs. Determining even a seemingly simple number, such as “the count”, i.e. how many students participate, is difficult. Various disciplines use different terminology including research, internships, capstones, scholarship, creative activities, performances, and co-ops. Our institution is evaluating the impact of URSCA through data pooled from three sources. These data pools are student reported data through the National Survey of Student Engagement, faculty reported data through our annual reporting system, and objective participation data through our office of undergraduate research. This presentation will explain our methodology for determining URSCA participation and initial results of the impact on students.

**Accelerated Research Opportunities (ARO) Living Learning Community****Stepping in Stigmatized Shoes**

Student Presenter(s): Noa Powell Nashly Sasso

Faculty Mentor(s): Jane Machin

In the United States alone, one in four people are affected by a diagnosable mental illness. Of these mental illnesses, depression and anxiety are the most common. The percentage of students who report feelings of depression that are so extreme it’s “difficult to function” has increased 34% over the last decade. Feelings of “overwhelming anxiety” has followed this pattern, with the number of students reporting feelings of “overwhelming anxiety” increasing by 35%. However, majority of these individuals who are struggling with depression and anxiety remained untreated. This is largely due to the stigma that surrounds these mental illnesses at the personal, community, institutional, and structural level. In an effort to reduce this stigma, we will follow Design Thinking practices to develop and test simulation activities that will help those without a mental illness to better understand what living with depression and anxiety. Through these simulation activities, we hope to parallel the internal symptoms of depression and anxiety, along with the psychosocial consequences of them, among mentally healthy populations who participate in everyday consumption activities.

**Accelerated Research Opportunities (ARO) Living Learning Community****iDye Pink as a Fluorescence-Based Probe for Microplastics With Differing Chemical Compositions**

Student Presenter(s): Brooke Baumgarten                      Haley Collins

Faculty Mentor(s): Amy Baliya

Microplastics consist of small particles of plastics with dimensions less than approximately 5 mm x 5 mm. Microplastics can be composed of many different types of polymers, including packaging materials, textile fibers, adhesives, and consumer product additives. Microplastics accumulate in the environment, causing them to eventually contaminate fish and wildlife tissues and human food supplies.

Because microplastics originate from many sources, preventing their introduction into the environment is a significant challenge. Removal of microplastics from water and soil has also proven to be difficult. As a step towards identifying and quantifying microplastics in the environment, a fluorescent staining technique has been developed in which iDye Pink, a fluorescent dye, is introduced to a field sample of water, soil or animal tissue. Adsorption of the dye onto microplastics creates a fluorescent beacon indicating the presence of microplastic particles. The purpose of this research is to further understand the utility of iDye Pink as an indicator for microplastics. iDye Pink staining has been performed with different polymer samples, including samples which have undergone degradation. Initial results demonstrate that iDye Pink can stain poly(ethylene)terephthalate (PET) microparticles.

**Accelerated Research Opportunities (ARO) Living Learning Community****Using A Design Thinking Methodology To Establish Forensic Science Stakeholders In Virginia**

Student Presenter(s): Kaitlyn Sisk

Faculty Mentor(s): Holly Cline

Forensic Science is responsible for identifying, collecting, and analyzing evidence. This requires an intricate network of interactions between regions and people of multiple expertise. This study examines five major pieces of the forensic science system in Virginia: department of forensic science, department of health, law enforcement, the court system, and evidence. Using a design thinking methodology, a stakeholder's map was created to visualize how these pieces interact with each other. A stakeholder's map is essentially a map of networks, and in this case, a map of people of multiple expertise. These experts, while separated from the other departments, are all working towards a common goal; information to link the evidence to the crime. The stakeholder's map shows how each department, while separate entities that carries different responsibilities' are interconnected through communication and science.

**Arctic Geophysics Student Research****Quantitative Analysis of Sea Ice Hardness in Barrow, AK**

Student Presenter(s): William Nape

Faculty Mentor(s): Rhett Herman

One property of minerals that has been analyzed on a quantitative basis is hardness. Hardness can be measured in a few ways by observing resistance to scratching from other materials or resistance to deformation from applied pressure. Because the sea ice in Barrow, Alaska can be categorized as a mineral, it follows that its hardness can be compared to that of other minerals. This study utilized the Vickers Hardness Test, a test typically used to classify materials according to their resistance to deformation. Using an Arduino micro-controller and a force-sensitive resistor, this study mimicked the Vickers Test for the purpose of comparing sea ice hardness against other materials. The Vickers Hardness numbers are converted to an equivalent pressure in Pascals to provide more easily comparable figures.

**Arctic Geophysics Student Research****Microorganism Concentrations in the Vertical Placement of Arctic Sea Ice**

Student Presenter(s): Katelyn Collett                      Katelyn Collett

Faculty Mentor(s): Rhett Herman

Microorganisms that live in the sea ice are essential to the Arctic ecosystem and their habitat is constantly changing. They withstand the extreme cold and survive off the salty brine that is pushed down and expelled back into the ocean as the ice freezes. The diversity of such microorganisms is largely unexplored, and only assumptions can be made about where they would be most populous. It is necessary to create a base knowledge of these organisms in order to prepare for the future changes in climate and make educated decisions on how to protect them. Eight cores of sea ice were collected off the coast of Utqiagvik (formerly known as Barrow), Alaska in around 50 meter increments from the shore at two different points. Around 5-7 samples were taken from each core, starting at the bottom and extending up, based on the total length of the core and over 50 samples were collected in total. Due to extenuating circumstances, the plan to perform a Gram stain on the samples was not able to be done, so there is no resulting data to be analyzed. Each sample would have been stained and the counts of microorganisms would have been averaged in order to determine a concentration. The assumption is the samples that came from the same point on each core would have had similar concentrations, and a difference would have been seen in the concentration of microorganisms for each section of the core.

**Arctic Geophysics Student Research****Friction Layer of Wind Above Arctic Sea Ice**

Student Presenter(s): Alex Anderson

Faculty Mentor(s): Rhett Herman

Earth's surface and the wind have an interaction that is governed by friction. Wind blowing over the ground will be hindered by the topography of the ground, and this hindrance is dependent upon the vertical distance from the ground. The sea ice presents an interesting situation as the "rough" part extends vertically for almost a meter. My project investigated this interaction using 4 vertically-distributed anemometers mounted on a post, with the data acquired via an Arduino microcontroller. Data were acquired at ~2-meter horizontal intervals along lines that were nearly 20 meters long. This array was successfully deployed in 2 different locations on the ice. The results will be presented and discussed, and compared to previous measurements obtained in the Radford University research wind tunnel.

**Arctic Geophysics Student Research****Seismic Activity on Arctic Sea Ice Near Utqiagvik (Barrow), Alaska**

Student Presenter(s): Hunter Witt

Faculty Mentor(s): Rhett Herman

This project studied "seismic" vibrations of the arctic sea ice just offshore from Utqiagvik (ne' Barrow), Alaska, in early March of 2020. I built a 3-axis seismometer using professional grade geophones. The data from the geophones were collected with an Arduino "Nano" microcontroller. The tiny signals (voltages) from the geophones were each amplified with both 386 audio amplifier chips as well as LT1477 operational amplifiers (amplification factor ~2,700).

The data were collected ~140 times per second and were of the format (time, X, Y, Z) where "time" is the time of data acquisition, and X,Y,Z were the relative vibration amplitudes for each of the 3 axes. Data were collected in 2-3 hour blocks on several days. We moved away from the seismometers immediately after starting the collections so our movements would not be in the data. The total number data points were over 5 million. Thus, preliminary results from these geophones will be presented here and discussed.

### Arctic Geophysics Student Research

#### **Identifying Microplastic Concentration in Arctic Sea Ice**

Student Presenter(s): Rose Tomiak

Faculty Mentor(s): Rhett Herman

Recently scientists have found microplastics - pieces of plastic <5mm in extent - all over the world, including remote places like the Arctic. Microplastics cause long-lasting damage to ecosystems by traveling through the food web and slowly accumulating toxic chemicals. The goal of this work was to identify the concentration of microplastics in different levels of ice and see how this corresponded to the albedo of the sea ice. In early March of 2020, we obtained eight ~4.5-inch diameter ice cores at 5 locations in the arctic sea ice just offshore from Utqiagvik (Barrow), Alaska. We took sample slices of the cores every ~30cm along the core. We kept these frozen - except for the plane trip back - and they are now waiting for analysis. Future analysis will include determining the concentration of microplastics in different locations using the ice core samples. The concentration will be determined by dyeing particles pink and using a specific wavelength to determine the physical makeup of each particle. Further research should be conducted to determine the albedo of the Arctic sea ice in similar locations to the ice core samples, so the albedo and microplastic concentration can be compared.

### Arctic Geophysics Student Research

#### **Water Pressure Variations Under The Arctic Sea Ice**

Student Presenter(s): Deanna Perales

Faculty Mentor(s): Rhett Herman

The goal of this project was to measure how ocean tidal pressure could cause an already stressed fault to rupture and cause mini "ice quakes" on the arctic sea ice just offshore from Utqiagvik (n'e Barrow), Alaska.. For this work, I took a SparkFun MS5803 pressure sensor and made it weather- and waterproof through the use of clear epoxy and pvc components. This allowed me to put the sensor in the arctic ocean under the sea ice through a hole that we bored into the ice. This was done early March of 2020, in an area where the ice was approx. 1.8 meter thick. An Arduino microcontroller at the surface acquired data (via wire) from the sensor every 0.10second. This short time resolution would allow both short- and long-term changes in the pressure of the water. We were able to acquire data only once due to an impending blizzard. However, data were successfully obtained over the course of 26 minutes, yielding a total of over 15,600 distinct readings. This poster details the building of this sensor, along with the results of this measurement. Possible future work in this area will be discussed.

Art Showcase**Medieval Marginal Imagery and its Monstrous Nuances: The Formation of the Grotesque**

Student Presenter(s): Karolin Howard

Faculty Mentor(s): Carlee Bradbury

This pan-academic analysis will be discussing the profound development of marginal art and its nuanced forms through the study of the monstrous and its lasting intrigue. Specifically, it will be harnessing the studies of previous scholars, such as J. J. Cohen and D. H. Strickland and branching from them, delving further into both interpretations and connotations of the creatures that are commonly found across the pages of many surviving folios and surviving Mappa Mundi. The thesis that these inherently monstrous images come from more than just the bored artist, will be approached via the linkage of monster theory, historiography and art history under a larger umbrella in order to touch on all subjects. This monstrous illumination and this discussion will expound on some of the possible interpretations for the images that riddle these folios.

Concerning visuality of these folios and their continued symbolism that comes from the combination and sometimes contradictory merging between text and image, there can be a spectrum of problems, and that comes with the attempt to interpret these illuminations. The interpretations of these images can range from one extreme to another and include some rather odd details in the margins, sometimes not even having anything to do with the text it accompanies. While many have seen the imagery as just a play on the imagination of the artist, or as commentary on the text next to it, it is all the above, multifaceted and brimming with both meaning and curiosity and societal paradigms.

Art Showcase**Escape the Isolation: Gabriele Münter's Pursuit of Utopia in German Expressionism**

Student Presenter(s): Lucas White

Faculty Mentor(s): Roann Barris

Art movements throughout history often seek a clear goal, which change in aim and scope at any one moment. The dawn of the 20th-century saw the unraveling of traditional representative norms in art towards the slow crawl to the modernist expression. German Expressionism is one of the early movements that challenged the notion of objective representation and found its key principles in illustrating the changing social atmosphere of Germany and the search for a utopia, conveyed through art, rooted outside of the unfamiliar, frightening landscape facing these artists and the emotional angst that resulted. Gabriele Münter was one of the pioneering figures in German Expressionism, who provided a different, yet necessary voice in emotional exploration and the pathway to her own paradise, free of the strange country that used to be her own and the oppressive opinions of her contemporaries. The research here highlights Münter's struggle against the shifting social systems of Germany in the early 20th-century and the conflicts aimed at her, as a woman artist. It also demonstrates how Münter conveyed this through the Expressionist lens of communicating emotional angst, the loneliness of social and personal separation, and Münter's novel style of reaching her own utopia through sensitive artistry.

Art Showcase**House-Bearers and Mounted Archers: Archeological Findings Regarding the Lifestyles of the Scythian Peoples and What Became of Them**

Student Presenter(s): Sidney Ripley

Faculty Mentor(s): Carlee Bradbury

My proposed research project is a comprehensive power point video presentation based on my findings in my research paper on the ancient Scythian people, exploring their lifestyle, culture, and impact through articles, artifacts, their artwork, and other primary sources. The Scythian's distinctive goldsmithing, remaining artifacts, and other firsthand sources from ancient cultures will be analyzed to pull together a basic study of their daily lives, with a basic range of their influence on other cultures and societies. Also discussed will be the differing hypothesis on what happened to the Scythian people, the evidence of these claims, and what these claims mean to the cultures who claim them. Together, this paper will be a comprehensive source on the culture, lifestyles, and effects of the Scythian people on the continents and cultures they inhabited.

The Scythians left an indelible mark on the cultures they came into contact with, and yet are often underrepresented in history, often meriting little more than an aside in history books on ancient cultures. Their culture was thought to reach from as far as Greece and Persia to Northeastern Russia, and many from both Mediterranean and Eastern European countries have disputed their origins and the eventual location of their final outposts. There are claims of the Scythians and Samaritans marrying in with and forming families with the proto-slavic groups of ancient times, and others claim that they became a Turkish people. Many Scythian artefacts are found in Russia and other Slavic countries, with these investigations concluding that they came from eastern regions to their interactions with other cultures such as the Greeks and Persians. Their artistic influence can be found encompassing large swaths of Eastern Europe and Russia. In these areas as well, many of their burials have been found preserved, with incredible amounts of information shown through clothing, jewelry, and their mummies, often with their trademark animal tattoos, from which we can make conclusions regarding the ways of life for many members of this incredible group.

Art Showcase**Art History through the Ages**

Faculty Mentor(s): Roann Barris                      Carlee Bradbury

The art history subsection will contain several presentations by students in Prof Bradbury's and Prof. Barris's art history classes. Some were prepared as presentations for the now-cancelled Longwood medieval history conference; others are related to class projects in the areas of exhibition planning and contemporary art history. All presentations will be narrated power points saved as video files. Most of the presentations were completed in our new online pandemic environment. Be prepared for surprises and insights.

Art Showcase**Remains: A Series of Photography-based Serigraphs**

Student Presenter(s): Leslie King

Faculty Mentor(s): Rebecca Ghezzi Ken Smith

Though the subject of Remains seems straightforward; landscapes created between Alabama and Maryland as seen and photographed from a moving vehicle, it is a study in time travel, capturing the not quite what was or is, but what remains when two time periods collide. These images are how I hold on to time. These places, real but altered by my perspective and thoughts, are of the fleeting moment. They are the in between of an inhale and expiration of breath. They allow me to just stop.

Remains, this series, is my documentation of hope and loss from a year when I said goodbye to many I held dear. Looking out the car window as I traveled from assisted living facilities, hospitals, hospices, and veterinarians, this work represents the blur and the need to catch my breath but failing to do so. And this is the refuge of choosing a random moment and place to pause.

I created this series as a memorial to not only to those I have lost or am losing, but as a talisman to the world around me. It is a reminder to look for the unexpected and the unseen, and to find comfort in times beyond the routines and assumptions. Perhaps the images will reflect a small sense of peace as we go about living.

This video represents my journey through process and creation.

Art Showcase**Wearable Life: Exploring the Traditional Studio Practices of Photography and Metalsmithing**

Student Presenter(s): Lucas White

Faculty Mentor(s): Alison Pack

This body of studio observation, research, and experiments with digital photography and modern metalsmithing techniques aims to unite these two mediums to unravel the long-held notions of separation and tension between the studio arts, and even elevate both mediums further than they could have reached on their own. By utilizing the fairly novel metalsmithing technique of water-slide decals, taking a digital image, applying it to an enameled glass surface, then firing the enameled surface to adhere the image to the glass, this study is able to provide a creative space for expanding both conceptualization and artistry within the mediums of photography and metalsmithing. Generating not only deeper expansion within the respective mediums, this study creates another pathway in which artists can explore their artwork and personal style without the restrictive history of the separate mediums as an obstacle for inventive development. One way this study has recognized the potential for artistic innovation that combining these two mediums of different dimensionality is the inception of a body of work that produces three-dimensional jewelry highlighted by two-dimensional botanical portraits to communicate the correlation between the human body, augmented by the jewelry, and the plant life, decalced onto the jewelries surface. In this way, this study not only fills the gaps that divorce the mediums of studio art, but even carves a pathway for multi-disciplinary collaboration that results in breaking the traditional limits of the studio arts.

**Artis College Research****A re-evaluation of the Atterton technique: A method for sex estimation using the clavicle**

Student Presenter(s): Sadie Friend

Faculty Mentor(s): Cassady Urista

In addition to pelvic and cranial methods for sex estimation, biological anthropologists commonly look to other postcranial elements to strengthen the probability of their estimates' the current study re-examines the applicability of the clavicle. Previous research conducted by Atterton and colleagues (2016) established a discriminant function using the variables of clavicular circumference and clavicular length for sex estimation in a medieval British sample with an accuracy rate of 89.6%. The current study determines the accuracy of the Atterton et al. discriminant function on two comparatively modern skeletal collections; the Bass Donated Skeletal Collection, which is predominantly composed of individuals from the early 20th century, and the Hamann-Todd Osteological Collection, primarily composed of individuals from the late 19th century. The success rate of the discriminant function was determined by comparing the results using general percent agreement. In this study, the function was successful in estimating the sex of 58% of females and 97% of males. When analyzed by ancestry it was successful for 89% of black individuals and 87% of white individuals. When comparing pooled individuals (of both sexes and ancestries), the function successfully estimated the sex in 98% of black males, 96% of white males, 62% of black females, and 55% of white females. The accuracy rate of this modern sample (87.5%) is consistent with that of the medieval population.

**Artis College Research****Biparietal Osteodystrophy: Etiology and Implications**

Student Presenter(s): Aubree Marshall

Faculty Mentor(s): Cassady Urista

Two adult individuals from the Robinson site, an enslaved community located in Virginia, were found with thinning of the parietal bones. A differential diagnosis and skeletal analysis are undertaken to shed light on not only the disease etiology, but also on how this condition might have affected their lived experiences. This lesion has been noted in the archaeological and modern medical literature and typically presents symmetrically on both parietals. It does not appear more often in any region of the world, but it does appear more often in older females. There has been no definitive answer to why this condition forms. Multiple conditions could lead to parietal thinning including: pressure atrophy, osteoporosis, growth defect, age atrophy, congenital, and biparietal osteodystrophy (also known as biparietal symmetric atrophy). After skeletal analysis and comparison of the disease presentation, biparietal osteodystrophy seems the most likely cause. The age and sex of the individuals, as post-menopausal women, as well as the lesion presentation make this condition the best fit. While the underlying cause of biparietal osteodystrophy have been debated; a review of the clinical literature suggests it may be the result of an endocrine disruption of sex hormones due to menopause. As this condition is progressive, these women would have lived for a period of time before it would have been noticeable. While they may have experienced no difference in their day-to-day life, the clinical literature notes that painful headaches are sometimes experienced with this condition.

**Biology Research****The epidemiology of leishmaniasis in the event of climate change**

Student Presenter(s): Kateri Schoettinger

Faculty Mentor(s): Jason Davis                      Cassidy Urista

Leishmaniasis is a tropical disease caused by a protozoan parasite (*Leishmania braziliensis*) which infects mammals through a phlebotomine sand fly vector. Leishmaniasis affects an estimate of 12 million people in 88 countries of tropical, temperate, and subtropical climates. Leishmaniasis does not currently have effective treatment in the United States due to few cases and little concern of epidemiological spread. New World leishmaniasis is prevalent in countries in South America and Central America due to the suitable climate for sand fly survival. This paper proposes that imminent climate change may cause future climates in North America to become suited to sand fly survival. Epidemiological predictions suggest the possible spread of sand flies to locations in Mexico or the United States. If climate change cause environmental shifts that make habitats more suitable for sand flies and therefore leishmaniasis, then leishmaniasis infections could become a substantial health issue in the United States and in particular heavily populated southern urban areas such as Atlanta. In that case, a push for research into leishmaniasis treatments should be accelerated in order to prevent widespread disease in America.

**Biology Research****Using a BACI Design to Assess the Effects of a Natural Gas Pipeline Installation Through Mill Creek, VA: Reporting on the Pre-Installation Stream Structure**

Student Presenter(s): Donya Mohamed

Faculty Mentor(s): Jaime Lau

A natural gas pipeline is planned to cross several streams in Southwest Virginia. The pipeline installation process modifies the stream riparian area, channel, chemistry, and macroinvertebrate assemblage. We designed a before-after-control-impact (BACI) study to determine the effects of the installation process on Mill Creek and one of its tributaries. In March and August 2019, we conducted a systematic physical habitat assessment and collected macroinvertebrates in 4 control and 6 impact sites, pre-installation. We also recorded weather and measured water chemistry, including basic chemistry, metals, anions, and cations. A principle components analysis was used to explore how our sites are structured in regards to the abiotic factors. Nonmetric multidimensional scaling (NMDS) will be used to explore potential differences in the macroinvertebrate assemblage structure. Our sampling seasons are appropriately separated by the weather variables. The physical habitat is not different between seasons. However, the small streams sites are explained by 3 habitat coefficients of variation, and the larger stream sites are explained by the mean width, depth, and discharge. The collection seasons are distinctly separated based on the water chemistry, but the sites did not logically group together as expected. We are still identifying the macroinvertebrates in the August samples and will report on the NMDS results. The pipeline completion is expected in late 2020; our BACI design will allow us to effectively capture any structural changes produced by the installation process.

**Biology Research****Not your Average Fleas! Impact of Microplastics on Daphnia Magna**

Student Presenter(s): Kevin Pham

Faculty Mentor(s): Sara O'Brien

Plastic waste is a persistent issue in the environment and has continued to accumulate in many ecosystems (Ziajahromi, Neale, Rintoul, & Leusch, 2017). Dynamic environmental degradation processes (mechanical, thermal, UV) has caused existing plastic waste to become a newer and different threat-microplastics. These microplastics are defined as plastic particles <5 mm in diameter (Smith, Love, Rochman, & Neff, 2018). In addition to microplastic waste from degradation processes, industries manufacture microplastics and implement them into skin care or textile products that inevitably end up as waste in aquatic and terrestrial habitats. Consuming microplastics may impact organisms via retention in the gastrointestinal tract as well as introducing harmful endocrine disrupting chemicals that leach from degraded plastic. We believe that once microplastics enter the digestive track and accumulate, lack of nutrition, inability to digest, and body burdens may impact overall foraging behavior, reproductive success, and predator avoidance strategies. In order to evaluate microplastic impact on an aquatic species, we conducted a dose response feeding trial of microplastics to water fleas (*Daphnia magna*). In our feeding trial, we monitored mortality, foraging behavior, jumping-like behavior, reproductive output, and diel vertical migration. A subsample of individuals was collected for microscopy work to determine gut load of retained microplastics as well as impacts to morphology. We believe that *Daphnia* may have ingested microplastics, but further experimentation must be done to fully evaluate impact on behavior and reproductive success. Based on this preliminary data, we hope to clarify with future studies whether microplastic exposure impacts *Daphnia* and what implications follow once it bioaccumulates up the food chain as they are an important food source for many other aquatic wildlife.

**Biology Research****Surveying COI Primers in specific mock communities for Biodiversity in Aquatic Insects**

Student Presenter(s): Camryn Williford

Faculty Mentor(s): Tara Pelletier

Metabarcoding uses DNA identification to identify the taxonomic groups within an environmental sample, allowing us to target aquatic insects found in freshwater. The identification of species relies on the ability to match the sequences with reference to barcodes for taxonomic identification. The use of specific primers can be used to target the mitochondrial Cytochrome Oxidase I gene (COI), which in most animals is the standard barcode for identification. Quantifying the biodiversity using environmental DNA is often hindered by specificity of the primer. We tested several sets of published COI primers (Leray et al 3013; (Elbrechet and Leese 2015,2017) to determine which would best help us target aquatic insects in SW VA. Ultimately, these efforts in methods development will be used to monitor long-term biodiversity patterns. Five distinct mock communities were constructed from a total of 11 known insects found within the streams of Wildwood Park in Radford. Each mock community was constructed to contain a range of concentrations of DNA from the 11 insects. High and low proportions of DNA for each insect were mixed to replicate the varying mass abundance of species that could be seen in the environment.

**Biology Research****A Birds Eye View: The Benefits of Trees for a Mid-Sized University**

Student Presenter(s): Sierra Felty                      Elise Simmons                      Eloni Hull

Faculty Mentor(s): Christine Small

Trees are critical to ecosystems and society, providing habitat for wildlife, offsetting CO<sub>2</sub> emissions, and contributing to energy savings and improved air quality. There are nearly 90 species and more than 1,000 individual trees on the Radford University campus. As our university continues to grow, it is imperative that we consider the value of our trees and potential species loss. A major goal of our research is to calculate economic and environmental benefits of campus trees and help to prioritize trees during construction planning. We used the i-Tree Benefit Calculator to estimate benefits for more than 100 trees on central campus. For example, Osage Orange has a circumference of 18.25 ft. Based on its size, sun exposure, and proximity to buildings, i-Tree estimates it has stored nearly 140,000 lbs of CO<sub>2</sub> during its lifetime, an ecosystem service valued at \$3,230. This tool also estimates the tree's effects on stormwater runoff, removal of air pollutants, and energy and fuel savings. A second goal of our research is to document national and state champion trees, the biggest trees of their species. Fifteen species were identified as potential state champions, including the Blue Spruce (*Picea pungens*) and Katsura Tree (*Cercidiphyllum japonicum*). Our results highlight the importance of campus trees and nominate potential state champions, raising awareness and respect for their value among the campus community.

**Chemistry Research****Temperature Dependent Stabilities of the C<sub>44</sub> and K@C<sub>44</sub> Ca@C<sub>44</sub> and Sc@C<sub>44</sub> Endohedral Metallofullerene Isomeric Set**

Student Presenter(s): Evan Wood

Faculty Mentor(s): Timothy Fuhrer

Since their discovery in 1985, Fullerenes have been an intriguing subject due to their structure and varying stabilities and potential use in medical and energy research. Fullerenes with less than 60 carbon atoms are especially interesting due to their violation of the Isolated Pentagon Rule. In our current project, we investigate the temperature dependent thermodynamic stabilities of the C<sub>44</sub>, K@C<sub>44</sub>, Ca@C<sub>44</sub>, and Sc@C<sub>44</sub> isomeric sets as computed at temperatures ranging from 298 K to 6000 K, using Density Functional Theory (B3LYP/6-31G(d)) for geometry optimization and frequency calculations. Data from the computations are evaluated using statistical thermodynamics formulas to show the relation between mole fraction and temperature for every isomer of C<sub>44</sub>. Different graphs of metallofullerenes allows for an understanding of the influence of charge on the stability C<sub>44</sub> for varying isomers. This information is used to determine the most stable isomer of C<sub>44</sub> at any temperature which will allow experimental chemists to more easily characterize C<sub>44</sub> isomers they find in very small amounts in their plasma-arc soot.

Chemistry Research**Theoretical Explanation of Reaction Site Selectivity in the Addition of Phenoxy Groups to Perfluoropyrimidine, Perfluoropyrazine and Perfluoropyridazine**

Student Presenter(s): Rachel Chapman

Faculty Mentor(s): Timothy Fuhrer

Pentafluoropyrimidine, perfluoropyrazine and perfluoropyridazine, potentially useful precursors in organofluorine methodology, likely undergo selective substitutions of fluorine with phenoxide type nucleophiles in similar or related to fashion to that of perfluoropyridine. In this project we provide theoretical predictions and explanations for these selectivities through use of density functional theory models of reactants, products, intermediates and transition states. Our models include energy values, geometric parameters and molecular orbital geometries in an attempt to find an overall theory of nucleophilic substitution ( $S_NAr$ ) selectivity for perfluoro heteroaromatics.

Chemistry Research**Colorful Polymers**

Student Presenter(s): Camryn Burke

Faculty Mentor(s): Christine Hermann

The purpose of this research was to revise polymer lab procedures to be used in Organic Chemistry lab. The first step of the research was to revise general polymer lab procedures to include more specific instructions. The procedures included polymerization of styrene, polymerization of methyl methacrylate, and the synthesis of Nylon-6,6. The revised methods were then performed multiple times to ensure the procedures worked smoothly. Another aspect of this research was to find a way to implement an additional and exciting element into each of the procedures; this included the idea of coloring the polymers. Several ideas on how to color the polymers were proposed including the use of crayon, food coloring, or glitter. Crayons were best used for coloring in polymerization of styrene and polymerization of methyl methacrylate. Food coloring was determined to be the best for coloring in the synthesis of Nylon-6,6.

Chemistry Research**Bisphenol-A (BPA) Degradation Using Bacteria**

Student Presenter(s): River Fiedler

Faculty Mentor(s): Sarah Kennedy

Bisphenol-A (BPA) is a known carcinogen found in most synthetic plastics. BPA disrupts normal hormone levels and normal development in fetuses, babies, and children. The main goal of this research is to observe the bacteria *Serratia marcescens* as it degrades a known amount of BPA in solution and then analyze the degree of degradation using high performance liquid chromatography (HPLC). Preliminary work involves recording bacterial growth in different percentages of solvents over time, and method development for the separation of the BPA from bacterial growth media. The conclusions from this study could be meaningful for the development of current and novel techniques for BPA bioremediation.

### Chemistry Research

#### **Complementary Uses of Computational Chemistry to Understand Enzymes**

Student Presenter(s): N. Lizabeth Thomas

Faculty Mentor(s): Sarah Kennedy

In my two research projects, I have used computational modeling as a methodology to understand enzymes. In the first project, alpha-glucosidase was modeled computationally and mutated to gather further data on how it was binding to flavonoids. Over the course of working on modeling and mutating alpha-glucosidase a second project was inspired. This second project was to create a bioinspired model of an enzyme's active site. These two types of modeling projects complement each other in that one is about studying and mutating the amino acids around a binding site while the other project seeks to inorganically mimic the amino acids around an active site using inorganic molecules. Mimicking the amino acids around an active site can improve the original functionality of the enzyme depending on how it is mimicked and altered. This second project focused on modeling an inorganic alternative active site from NiFe-hydrogenase.

### Chemistry Research

#### **iDye Pink as a Fluorescence-Based Probe for Microplastics With Differing Chemical Compositions**

Student Presenter(s): Brooke Baumgarten                      Haley Collins

Faculty Mentor(s): Amy Baliya

Microplastics consist of small particles of plastics with dimensions less than approximately 5 mm x 5 mm. Microplastics can be composed of many different types of polymers, including packaging materials, textile fibers, adhesives, and consumer product additives. Microplastics accumulate in the environment, causing them to eventually contaminate fish and wildlife tissues and human food supplies.

Because microplastics originate from many sources, preventing their introduction into the environment is a significant challenge. Removal of microplastics from water and soil has also proven to be difficult. As a step towards identifying and quantifying microplastics in the environment, a fluorescent staining technique has been developed in which iDye Pink, a fluorescent dye, is introduced to a field sample of water, soil or animal tissue. Adsorption of the dye onto microplastics creates a fluorescent beacon indicating the presence of microplastic particles. The purpose of this research is to further understand the utility of iDye Pink as an indicator for microplastics. iDye Pink staining has been performed with different polymer samples, including samples which have undergone degradation. Initial results demonstrate that iDye Pink can stain poly(ethylene)terephthalate (PET) microparticles.

### Chemistry Research

#### **Mutagenic analysis of E. coli beta-glucuronidase: Importance of F365 in the bacterial loop in inhibitor binding**

Student Presenter(s): Rayshell Torres-Santana

Faculty Mentor(s): Kimberly Lane

Beta-Glucuronidase, found in humans and E. coli, is a protein that breaks down complex carbohydrates. This protein has been associated with the severe gastrointestinal (GI) side effects associated with administration of some chemotherapeutic drugs, such as CPT-11, for colon cancer. Previous studies have identified several potent inhibitors targeting bacterial beta-glucuronidases to eliminate the GI toxicity of CPT-11; these studies have shown the inhibitor to interact with residues from the enzyme's active site, specifically the phenylalanine in the 365 position (F365). The purpose of this project is to generate mutations on the F365 position in order to see the importance of its interaction with a Z77 inhibitor in beta-glucuronidase. Mutations to the amino acid phenylalanine into leucine, alanine, tyrosine, and tryptophan have been completed, and the effects of the mutations on the enzyme's activity and inhibitor binding will be studied.

### Chemistry Research

#### **Methods for preparing alternating copolymers containing embedded barbituric acid pharmacophores**

Student Presenter(s): Twisha Mistry

Faculty Mentor(s): Amy Baliya

Polymeric drug delivery systems can be designed for controlled-release, leading to an increased therapeutic index of the drug. While several polymeric systems have been developed, additional work is needed to incorporate drugs into the polymer scaffold through environmentally friendly approaches. A new polymeric delivery approach was explored by reacting an analog of barbituric acid, a common pharmacophore, with polymerizable groups. The desired target polymers are alternating co-polymers containing embedded barbituric acid derivatives with minimal waste. In this talk, the preparation of barbituric acid derivatives and the polymerization method will be discussed.

**College of Humanities and Behavioral Sciences Showcase****A Sociological Look at the Siblings of Individuals with Disabilities in the Family**

Student Presenter(s): Shaylee Hodges

Faculty Mentor(s): Aysa Bodenhamer

In recent years, there has been increasing awareness and visibility of individuals with intellectual and developmental disabilities (IDD). Resources are increasingly available for both children with special needs and their parents. Many of these resources acknowledge the emotional and social impact that is placed upon the parents; however, the implications and expectations placed upon the siblings of those with disabilities is less discussed. The socialization of siblings into care-giving roles begins in early childhood and can span the rest of their lives, often until the disabled sibling is deceased. More severe disabilities and longer lifespans of IDD individuals pose new concerns for both parents and siblings of disabled individuals who must navigate secure, life-long caregiving. Rural locations with less publicly-available resources, pose even greater concerns and barriers to care-giving. Drawing from existing research on children with siblings with chronic conditions, disability severity, and studies conducted on the relationships between adults and disabled siblings, I examine the expectations placed upon siblings in care-giving roles.

**College of Humanities and Behavioral Sciences Showcase****Roots With Wings**

Student Presenter(s): Bijou Williams

Faculty Mentor(s): Melinda Wagner

Roots with Wings is a Floyd County Virginia Place-based Education Oral History Project. We also work with the Floyd Story Center at the Old Church Gallery in partnership with Floyd County Public Schools and Radford University. In order to preserve the history of Floyd County, our group conducts interviews with Floyd County residents to ensure that the history of the County will flourish years from now. Our purpose is to develop team-building skills, forge connections, and conserve culture. Oral history programs are organized by the Floyd Story Center and include large scale archives of photos, music, artifacts, interviews, and stories from people throughout Floyd County. The Old Church Gallery motto, "We Remember, We Collect, We Protect," expresses our mission in order to remember, collect and protect the oral, physical, and written history of Floyd County. Our interview process is important because this is one way individuals can read about their family history in Floyd. People are able to see sides of our community that they might not have been aware of.

**College of Humanities and Behavioral Sciences Showcase****Tinder In Intimate Relationships**

Student Presenter(s): Michelle Acosta      Jamisa Williams      Hunter Roger  
                                  Cameron Schmitz      Anna Petry

Faculty Mentor(s): Leigh Kelley

Tinder negatively affects intimate relationships in a number of ways, including catfishing (drawing someone into a relationship by way of a false online persona), lack of interpersonal communication, and unrealistic first impressions. We created a short film to explore the role of social media in relationships and share our findings. After the audience watches our film, they will see the negative effect of apps like Tinder on intimate relationships.

**College of Visual and Performing Arts Showcase****A Thousand Hands: a Million Stars**

Student Presenter(s): Katie Meeks      Reagan Mihailoff      Keagan Vickers  
                                  Cassie Williams      Drew Danaceau      Katelyn Peters

Faculty Mentor(s): Ji-Eun Lee

Through the month of February, the Radford University Department of Dance's advanced modern technique course choreographed a ten minute excerpt to be performed as Part of the presentation done by Professor Denise Ritter, a member of the Department of Music's faculty at Radford University, of "A Thousand Hands: A Million Stars." This collaboration not only served as a means to bring awareness of sex trafficking to the Radford community, but to also provide a professional experience for the students to collaborate and create works in a format common in the dance profession. To begin this collaboration, the dancers in the class researched both the precious presentations of "A Thousand Hands: A Million Stars" and further into sex trafficking in the United States to try and create a work that would support the topic presented. Creating and rehearsing three days a week and under the direction of their professor, Ji-Eun Lee, the students also explored further into the concepts of dance composition. Elements utilized in the creative process included partnering, group improvisation, and group choreographing. Due to the allotted time of one month to create and perfect their performance, under the direction of Professor Lee, the students received first-hand experience of working like a professional dance company under conditions similar to those in the dance industry. This collaboration between dance and music presents a work that sheds light, and awareness on a greater issue that may not be widely understood in the community.

College of Visual and Performing Arts Showcase**The Biometrics Effects of Playing Marimba on Balance and Movement**

Student Presenter(s): Rachel Steffen

Faculty Mentor(s): Lauren DiMaio

According to the American Music Therapy Association (AMTA), all music therapists are required to be competent in voice, guitar, piano, and percussion (AMTA, 2013). Specifically, competency 4.1.8 states, "Utilize basic percussion techniques on several standard and ethnic instruments" (AMTA, 2013). This shows that the AMTA values technical prowess on percussion instruments of all kinds, and shows their support for their use in a clinical context. While AMTA does not define "standard and ethnic instruments" for the purpose of this research the Marimba is considered a standard percussion instrument.

A marimba is a type of keyboard instrument that is typically made of rosewood or synthetic bars. Firstly, keyboard percussion instruments are percussion instruments that have well defined pitches and, in Western music, are set up in a similar structure to pianos (do I have to cite this?). According to Zeltsman, the marimba is a close relative of the xylophone (2019). The marimba is tuned so that its harmonics "resemble those of woodwind and string instruments" which distinguishes the sound of the marimba from the sound of the xylophone (Yamaha, n.d.).

Within the field of research in music therapy, there is a gap in the literature concerning keyboard percussion. There are many studies that use hand drums and drum sets, but very few discussing the use of keyboard percussion in music therapy practice. This research will begin to bridge the gap between music therapy and keyboard percussion. This research will also allow for new methods of treating movement restrictions within the field of music therapy. This project explores the possibility of using marimba to treat movement restrictions and difficulties.

Criminal Justice Research**Mental Health Courts: History, Impact, and Where Do We Go From Here?**

Student Presenter(s): Melissa Wirchansky

Faculty Mentor(s): Benjamin Wright

Mental Health Courts are an upcoming and developing system across the nation. Currently, there are many established specialized court systems (e.g. Drug Court, Domestic Violence Court, Juvenile Drug Court) which have been very successful in providing treatment and lowering recidivism rates. In 2011, the Mental Health Court system was established in the Roanoke Valley and is the first in the entire state of Virginia. We are looking to understand the impacts on the community and individuals who partake, as well as, understanding any possible obstacles that have occurred throughout the implementation process. Mental Health Court practitioners will be interviewed and their responses will be used to develop a well-rounded idea of the process of implementation, current day-to-day function and direction this system is taking.

Criminal Justice Research**Use of Force**

Student Presenter(s): Milan Edwards

Faculty Mentor(s): Margaret Pate

Use of force is the amount verbal or physical force needed by police to deescalate a situation for the law enforcement officer to gain control. However, based upon recent stories of law enforcement officers using force on American citizens, it has become clear that use of force may not be applied in the same way for all citizens. The research question to be answered for this project is, during a use of force event, what factors causes injuries? Law enforcement officers were randomly selected using stratified sampling from Seattle, Washington. Officers were recruited from multiple law enforcement agencies, including municipal, county, and sheriff's departments, to complete a self-report questionnaire. The questionnaire asked law enforcement officers questions about use of force incidents, including information on suspects' race, sex and age. The expected results are that nonwhite middle age male suspects are more likely to be injured than white female suspects in a use of force encounter. Based upon the results of this study, we may be able to show that police can hold community outreach programs for the community to better understand the definition of use of force, how it is applied, and any misconception anyone may have to limit future injury. Law enforcement training and in-training should focus on the defensive tactics needed for when a violent assault happens. However, the training should also teach officers everyday verbal skills. Law enforcement agencies need to learn how to train their officers to deal with violence without treating members of the community with unnecessary force and suspicion.

Criminal Justice Research**Community Policing Effectiveness**

Student Presenter(s): David Baughan

Faculty Mentor(s): Maggie Pate

In a community, there are certain people with authority that are there to help out individuals when there are problems or when someone is in trouble. However, a lot of individuals in communities may not trust certain authorities like law enforcement, which causes more problems since individuals do not have a positive outlook on law enforcement. Citizens in Alachua County Florida were surveyed before and after the Alachua County Sheriffs went through a training on communicating with the public. The researchers chose a neighborhood for the study that had high economic stress and various crimes. The researchers went door to door administering the survey and recording answers. Since the neighborhood being tested had very high rates of various crimes and had economic problems, it is expected that the majority of individuals would not have positive views toward law enforcement, even after the training. Typically, these areas have the most negative views toward law enforcement, as individuals living there are either criminals themselves or become victim to crimes that they believe police should be stopping. Since these are areas of high crime and economic distress, results may encourage law enforcement to increase their social interaction with the community. This would allow individuals that distrust or are not comfortable with law enforcement to feel better after hanging out with them more often and perhaps enjoying a free meal with their community, engaging in more social interaction, which is what the community needs.

Criminal Justice Research**Community Policing: Does Police Effectiveness And Collective Efficacy Have An Impact?**

Student Presenter(s): Sophia Gonzalez

Faculty Mentor(s): Margaret Pate

This paper aims to examine the impact of collective efficacy and police effectiveness on citizens' perceptions of the effectiveness of community policing. Previous studies tend to focus on community policing's effect on community perceptions of police. By integrating the existing research on collective efficacy and police effectiveness, it should further the understanding of the effects on community policing. This study utilizes data from the Community Policing in Baltimore project conducted by Pate and Annan; this data was a part of a longitudinal study consisting of two waves of citizen surveys. For the purpose of this study, the main focus will be on the second wave data collection using police effectiveness and collective efficacy to determine the effects on citizens' perceptions of the effectiveness of community policing. Overall, the findings suggest that communities with a consensus about social problems and solutions (collective efficacy) can be helpful for community policing. Citizen satisfaction with their local police department is an important concern for police; therefore, the findings from this study are useful for agencies that are in the process of implementing community policing. It is also important to note that there are going to be variations across neighborhoods and their levels of collective efficacy and perceptions of police effectiveness and community policing.

Criminal Justice Research**The Push for Higher Education for Police**

Student Presenter(s): Taylor Busick

Faculty Mentor(s): Margaret Pate

As American society has become increasingly diverse, police officers come in contact with people of all different backgrounds. Education may significantly increase police officer's problem-solving ability and address the needs of diverse community groups. When we look at specific groups of people and how law enforcement effectively problem solve, does education provide a significant edge to this workplace challenge that other officers do not have? A self-report study of police training in Arizona provides an in-depth longitudinal study of 446 police recruits surveyed about many things, including their on the job performance. The study here only will look at specific variables, problem-solving, assessing the needs of diverse communities, and education level in order to assess police performance within specific communities. The study's expected results should find that the higher the level of education, the more able police will be when working with and solving problems with specified minority groups. Education, especially those who have a bachelor's degree or higher, will be able to address community concerns using enhanced problem-solving skills than those who have a lower level degrees. Whereas research in the past as touched on similar topics, this research will prove to exemplify the importance of education in local and/state-level policing. Ideally, it would be beneficial to police departments to require an associate degree as a minimum education requirement because they would find more effective policing in multicultural or diverse communities.

### Criminal Justice Research

#### **Victim Satisfaction With The Criminal Justice System**

Student Presenter(s): Mackenzie Madison

Faculty Mentor(s): Margaret Pate

This research specifically looks at the legal measures that victims are given and whether victim rights are effective and provide victims with a high level of satisfaction with the criminal justice system. Data was collected from researchers from the National Center for Victims of Crime. Participants, which included victims, state officials, and local officials, took part in a survey to determine whether the legal measures that are given to a victim are effective. The specific questions used in this analysis look at victim impact statements, involvement during the process, and the levels of satisfaction with the many different parts of the criminal justice system. The expected results are that when a victim is included in the process of the criminal justice proceedings, they will have a higher level of satisfaction. It is still unclear as to whether a victim impact statement leads to positive perceptions of the criminal justice system and will be addressed further. Real world implications can come from this as the criminal justice system should want victims to have a high level of satisfaction with the process. Victims who are involved during the criminal justice process could change the outcomes of many cases and could impact the way that victims cooperate. Results and implications will be further discussed.

### Criminal Justice Research

#### **Terrorism in the United States after 9/11**

Student Presenter(s): Ty Houser

Faculty Mentor(s): Margaret Pate

This study examines different terrorist ideologies to determine their proposed risks toward the United States. This research will focus on terror attacks that have taken place since 9/11 to reveal the current threats to the United States. Data was collected from the Global Terrorism Database. The database has compiled over 190,000 incidents of terrorism from 1970 to 2018 through the analysis of millions of articles and news sources. In addition to including information regarding the terrorists' ideologies, the database also illustrates the target types, weapon types, and attack types utilized in each incident among other relevant variables. The dataset will be analyzed through SPSS to test the variables specific to this study. The research is expected to illustrate results of far-right extremists primarily targeting abortion-related facilities, eco-terrorists primarily carrying out attacks on infrastructure, and radical Islamic extremists causing the most fatalities and casualties through their attacks when compared to other ideologies. This research will provide implications for law enforcement and policy by highlighting the different terror threats to the United States. This research will also aid law enforcement and policy by identifying different target types and tactics utilized by each terror ideology to better protect and combat them in the future.

### Criminal Justice Research

#### **Impacts of school environment of student behavior**

Student Presenter(s): Lynda Burns

Faculty Mentor(s): Margaret Pate

The purpose of this research is to examine how school climate impacts students' behaviors, values in school, and attitudes. This research examines whether negative factors from school culture can be a cause to student disorderly conduct and criminal behavior in schools as well as identify student victimizations in response to their surroundings. This study utilizes self-report survey data collected from middle and high school students within the Philadelphia School District to explore the possibility that the climate youth experience in school would impact their victimization and delinquent behaviors in school. Students were asked about how they viewed themselves as a student, if they thought they were hard workers in order to gauge student values towards their education. They were also asked how they felt towards faculty, specifically, if the way they were treated by faculty were positive, if their coursework felt important, and how they viewed disrespect towards faculty. Student crime and delinquency questionnaire asked students how they felt about rules and disobeying them, how often they broke rules or harmed someone, and their gang involvement. I hypothesize that student's emotions and behaviors are impacted negatively by the disorganization, crime, and delinquency that occurs in the institutions they attend. Additionally, this impact may affect and lower in institutions of higher structure and more teacher-faculty presence because this can control for negative behavior. The real-world implications of this research may suggest that faculty which allows students to have a voice may improve student views towards faculty. Also, improving organization between faculty and higher involvement could result in less crime and delinquency.

### Digital Media Showcase

The annual Digital Media Showcase is an opportunity for students to showcase their work to an audience. Works showcased can include, but are not limited to, film, ePortfolios, podcasts, photography, software or any digital making project.

#### **My Time At Radford University**

Student Presenter(s): Megan Stitzer

Faculty Mentor(s): Samantha Blevins

This ePortfolio follows my courses and internship as a graduate student at Radford University.

#### **M&R Show**

Student Presenter(s): Malcolm Napier          Ronald Harrod

Faculty Mentor(s): John Hildreth

#### **Radford University Aged 100 Years**

Student Presenter(s): Tatiana Roberson

Faculty Mentor(s): John Hildreth          Samantha Blevins

Pictures of Buildings located on the campus of Radford University taken in present day, edited to look like they've been around longer than you have.

#### **The World Unknown**

Student Presenter(s): Emily Clemente

Faculty Mentor(s): Samantha Blevins

Digital photography is a way to see the world through a different lens. I have found that when we take a step back and change our perspective, the world can be a beautiful place.

#### **Cinematography Reel 2020**

Student Presenter(s): Eilish Bailey

Faculty Mentor(s): Charley Cosmato

The highlights of my cinematography work

**Geospatial Research****Sea Level Rise & Damage Cost from Sea Water in Pembroke Pines & Hollywood, Florida**

Student Presenter(s): Peter Romito

Faculty Mentor(s): Andrew Foy                      Stockton Maxwell                      Charles Manyara

This project will contain the total amount of sea level rise that has occurred over the last 16-years from 2004-2018. Studying how much of a change in land erosion due to sea level rise in the region of Pembroke Pines & Hollywood, Florida is the main goal. Conducting a Distance cost-matrix to see how much the average property damage is to each home or structure in each of these two city districts will also be assessed. The experiment will be analyzed by using GloVIS Landsat-7 satellite images. Then, I will conduct a supervised classification analysis in Erdas Imagine. This will lead me to find the Kappa Statistics, Overall Classification Statistics & other results. The purpose of conducting this type of analysis is to access if new construction should be taking place in Hollywood & Pembroke Pines, Florida

**Geospatial Research****Evaluation of Radford University's Green Infrastructure from 2003-2018**

Student Presenter(s): Christin Chitwood

Faculty Mentor(s): Charles Manyara                      Andrew Foy                      Richard Roth

Green Infrastructure is the design of utilizing our natural resources in order to mitigate stormwater runoff. As time passes, urbanization is creating a greater divide between the natural environment and human habitat through the destruction of natural ecosystems, and conservation of these ecosystems is essential to building and sustaining wildlife and society economically and ecologically. Green Infrastructure is used to infiltrate stormwater and reduce the amount of pollution present in runoff from urban areas. This study will model Radford University's Green Infrastructure and analyze how it has changed over time. It will also reveal the advancements, if any, of the GI design on campus. Aerial images from the National Agricultural Imagery Program (NAIP) are used from 2003-2018, to analyze building additions to campus, the areas of green space, tree canopy coverage, and the number of trees on campus. This study focuses on the sustainability practices on campus and evaluates the infrastructure differences at roughly 5-year increments. The project will be completed using the software program ArcGIS Pro and JMP, specifically, the One-Way ANOVA analysis. Based on visualizing the imagery data, over a 15-year period, the results are expected to reveal a decrease in the area of green spaces, an increase of impervious surfaces, as well as an increase in tree canopy cover/the number of trees.

### Geospatial Research

#### **Predicting Stream Impairment from Land Cover**

Student Presenter(s): Justin Moore

Faculty Mentor(s): Charles Manyara

According to the Clean Water Act a body of water becomes impaired because it has failed at least one of their regulations. Impairment is usually caused from non-point source or point source pollution while storm water runoff also is a common contributor for the cause of impairment. Forested stream corridors much like a stream buffer or riparian zone are primarily used near a water source in order to filter pollution that can derive from storm water runoff before it enters the waterbody. Having abundant vegetation present around a stream or river also helps slow down stormwater runoff by absorbing water infiltrating into the vegetative soils, filtering any pollutants before it can penetrate a nearby waterbody. What I am interested in is if land cover data could be used to help predict the impairment of a water body. You would think the more forested land cover a stream has the less likely that stream is to be impaired. While the less forested land cover, replaced by urbanized or built up land cover, is more likely to have impairment occur. In order for my prediction to be more realistic I will select approximately 15 of each impaired and non-impaired sub-watersheds (HUC-12) all within Virginia. Gather all the different types of land cover percentages for all 30 sub-watersheds in order to compare the averages of different land cover types between impaired and non-impaired sub-watersheds. In order to compare the averages, I will use a statistical analysis called the T-test on all the different land cover percent averages to see if these variables are correlated. What I am predicting is that sub-watersheds with less forested land cover and more urbanized or built up land cover will be more likely to be have non-impaired waters. While sub-watersheds with more urban or less forested land cover will be more likely to contain impaired waterbodies.

### Geospatial Research

#### **Impact Assessment of Urban Sprawl on Florida's Mangrove Forests**

Student Presenter(s): Alison Burchett

Faculty Mentor(s): Charles Manyara

Natural resource management is increasingly important in our changing world, mainly due to the impact humans have on our environment. One of the many ways that humans have impacted the environment is through urban sprawl. Urban sprawl is characterized by low development density, single land-use zoning, a lack of significant centers, and poor street accessibility. In Florida, the population has grown 17.6 % from 2000 to 2010. Even with proper city planning, a rapid increase in population can be damaging to existing land uses. Urban sprawl in Miami-Dade County has had a direct impact on the coastal wetlands in the Biscayne Bay. Using Landsat data this project will be focused on a land use/land cover change detection in the past 20 years to observe the impacts of urban sprawl in this study area, and therefore the impacts on the mangrove forests that are vital to the coastline.



Geospatial Research**Using Land Cover and Land Use Change to Predict Stream Impairment Within HUC-12 Watersheds**

Student Presenter(s): Bryce Conard

Faculty Mentor(s): Charles Manyara

Water quality is on the forefront of climate change as it is one of the most immediate issues facing our society. Through out the last two centuries humans have carved up the landscaped and formed it into our own. This had led to massive degradations in water quality and a spike in stream impairment. This was not brought into light until 1972 and was amended multiple times to allow for an efficient address of the problem.

This project aims to use a land use and land cover change analysis to delineate the possible different reasons for stream impairment in a given watershed. The study area is focused on the Chesapeake Bay watershed in Eastern Virginia. This is broken down into smaller water sheds by the Virginia Department of Environmental Quality known as HUC-12s. These micro watersheds focus on the smallest of drainage basins and provide the best insight into water kind of environmental degradation is occurring. The purpose of finding the relationship between land use and the type of stream impairment present is to create a model which could be used to help better prepare localities in solving their own water quality issues.

Geospatial Research**Using GIS technology to assess solar energy potential at Radford University**

Student Presenter(s): James Firgau

Faculty Mentor(s): Charles Manyara Josh Nease

Radford University enrolls around 10,254 students and 1,615 staff and faculty as of 2019. There is a total energy usage of 32,371.21 metric Tons of Co2 equivalent with only 0.41 % of that total energy consumption coming from clean and renewable sources. Many people believe that sustainable energy is a necessity for the future and should be implemented when possible. With less than 1% of the campuses energy coming from sustainable sources, there is only room to grow and improve. Solar energy is a wide spread source of sustainable energy and has already been implemented on many other college campus's around the world and will be the energy source focused on for this study.

Using geospatial analysis, sections of Radford University's main campus will be identified and the potential amount of solar radiation for these areas measured, to determine the locations of possible solar photovoltaic systems. Installations on rooftops , open fields , and parking lots are all common locations for these systems and will be the primary locations for the study.

I hope for this data to be the start of a foundation to be built upon for the future of sustainable energy at Radford University.

### Geospatial Research

#### **Analyzing the Efficiency of Evacuation Using Road Networks in Loudoun County, VA**

Student Presenter(s): Clay Rosales

Faculty Mentor(s): Charles Manyara                      Andrew Foy

The rapid increase of population growth in the Loudoun County area has led to cause for concern should there be a need to evacuate the county. By identifying the efficiency of evacuation through network analysis given the road networks, policy makers can make more informed decisions in the future regarding evacuation processes. This is quantitative research that utilized ArcGIS Pro software with the Network Analyst tool extension. The Network Analysis tool is used to quantify the evacuation of residents of Loudoun County based on the cost of transportation across the road network. The Network Analyst tool is used to identify areas of Loudoun County that are lacking accessibility to major road networks for evacuation. By developing an index and classification to measure what is considered “acceptable”, “good”, and “great” connectivity, it is possible to identify the areas of Loudoun County that are able to access major road networks as well as identify areas that are lacking access. The results of this research can be used to help policymakers identify areas of Loudoun County that may need more funding for access to major road networks.

### Geospatial Research

#### **Evaluation Of Virtual Surveying Accuracy Using UAV Photogrammetry Acquired At Different Altitudes When There Is Variable Terrain?**

Student Presenter(s): Redding Trent

Faculty Mentor(s): Dr. Charles Manyara

In today’s world surveying using aerial photography is now a common sight. Advancements in UAV aerial technology has grown tremendously in the past decade. Drones are now being used for aerial surveying cutting down on time spent on the job site versus using GPS and total stations. Deployable in minutes these UAV can capture very high-resolution images. But how accurate are these calculations? My goal for this study is to perform an accuracy assessment regarding variation in terrain over a constant altitude. Using first the Trimble R10 GPS receiver along with 30 ground control points four flights will be performed with the DJI Mavic Pro 2 UAV to assess the accuracy of each altitude. Data will be analyzed using RMSE to compare control points to similar point estimates established by photogrammetry. Results are still being processed.

Geospatial Research**Dendrochronology in Southwest Virginia**

Student Presenter(s): Nicholas Francis

Faculty Mentor(s): Stockton Maxwell

Dendrochronologists study the past through a unique lens by looking at the response of tree growth to changes in the environment over time. Tree-ring analysis provides more information than simply the age of the tree, they can also record changes in climate and forest disturbance events such as wildfire or insect outbreaks. Our main research question is relatively simple, where we are looking at how three different species of trees from Southwest Virginia respond to change in climate in addition to annual disturbances that may affect how the tree grows. The three species we are working with were cored in Wise County, Virginia. Eastern Hemlock, White Oak, and Yellow Poplar are the sample species for this particular analysis. To work with these core samples, they were first removed from the tree with an increment borer and then mounted, sanded, and scanned into a computer image. The sample were then measured to create a file database that can be put together in a master chronology and then cross-dated. The next step will be to analyze the Hemlock and Oak chronologies and make inferences as to how the trees responded to different climate and weather patterns. Although it may seem like trees are static objects, unphased by what is happening around them, they are recording the ecosystem around them by continuously putting on mass during the growing season and our goal is to unlock that information and make it easier to understand and interpret.

Geospatial Research**Dendrochronology Case Study: Potts Mountain**

Student Presenter(s): Redding Trent

Faculty Mentor(s): Dr. Stockton Maxwell

Dendrochronology is the scientific method of dating tree rings to the exact year they were formed. We can use dendrochronology to learn about past environments and determine how tree growth responds to changes in the environment. The purpose of this study was to examine the influence of climate on the growth of the tree species *Quercus rubra* (red oak) located at Potts mountain in New Castle, Virginia. We collected 2 tree cores each from 18 trees for a total of 36 samples. Samples were returned to the lab to be mounted and sanded according to standard dendrochronological practices. Then, tree cores were scanned and measured in image analysis software. Measurements were dated visually and statistically to ensure accuracy. The average growth chronology spanned from 1812 - 2019. Our preliminary findings indicate that trees are sensitive to changes in temperature and precipitation. However, disturbances to the forest can also affect annual ring widths.

### Geospatial Research

#### **The State and Future of GEOINT**

Student Presenter(s): Brittany Rinaldi

Faculty Mentor(s): Andrew Foy

Geospatial Intelligence, commonly referred to as GEOINT, analyzes geospatial data and imagery to depict and assess physical features on the earth. GEOINT is a combination of imagery, imagery intelligence, and geospatial information resulting in solutions for a broad range of disciplines. This study aims to identify and describe agencies involved in GEOINT and discuss examples of the newest technology and its application in the field. Numerous agencies including the Central Intelligence Agency (CIA), Defense Intelligence Agency (DIA), National Geospatial-Intelligence Agency (NGA), and the National Security Agency (NSA) utilize GEOINT to aid in executing their mission. The CIA provides GEOINT to the president and policymakers. The DIA uses GEOINT to support military operations by providing analysis of battle terrain and characterization of facilities. The NGA is the primary agency at the national level that provides GEOINT and is responsible for distributing data for other agencies to use. Lastly, the NSA provides signal intelligence, which can be understood at a deeper level by incorporating geospatial and pattern analysis. GEOINT is created using innovative and cutting-edge technology. Examples include virtual reality, artificial intelligence, and unmanned aerial vehicles (UAVs). UAVs, commonly known as drones, provide reduced lag time compared to traditional satellites, therefore they can provide accurate and real-time data integration in time critical situations. GEOINT is constantly evolving and adopting the newest technologies to maintain an advantage over adversaries.

### Health and Human Performance Research

#### **The Correlation Between Social Media Usage and Sexual Activity in Adolescents**

Student Presenter(s): Madison Gaminde

Faculty Mentor(s): David Sallee                      Laura Newsome

The purpose of this research is to analyze and interpret the correlation between social media usage and sexual activity in adolescents. A modified version of the Youth Risk Behavior Survey (2017) was used to collect data from 3281 high school students in Southwest Virginia. Survey questions related to the onset of social media usage and the self-reported ages of initial sexual activity. Survey questions related to the research purpose were compared using crosstabulations, odds ratios, and Chi-Squared analysis. Significant differences ( $p=.01$ ) were found between those that self-reported the initiation of social media usage at or before the age of 13 and the self-reported initiation of sexual activity on or before the age of 13. Participants who reported the initiation of social media usage on or before the age of 13 were 1.4 times more likely to report the initiation of sexual activity on or before the age of 13. Additional research is necessary to fully interpret if the onset of social media usage has an impact on the initiation of sexuality in high school students.

### Health and Human Performance Research

#### **PA Students May Benefit More From Earlier Mental Health Training**

Student Presenter(s): Hwal Lee

Faculty Mentor(s): Robert Hadley

PA students experience a high degree of burnout, and mental health indicators have been shown to worsen during clinical year of training. However, stigma and lack of awareness of resources remain barriers to help-seeking, and no published guideline currently exists to proactively support PA students' mental health. This study evaluated the effectiveness of Mental Health First Aid (MHFA) training for PA students regarding mental health literacy and stigma, awareness of resources, and practical application.

Incoming cohort (IC; n=31) and graduating cohort (GC; n=30) of PA students completed MHFA training in the week before matriculation and within one week of graduation, respectively. Pre- and post-training MHFA opinions quiz results were used to examine changes in mental health knowledge and stigmatising beliefs and attitudes, and student feedback was analysed to ascertain overall response to the training. Further, one-month follow-up survey responses were analysed to assess the utility of training.

Both IC and GC saw improvements in their opinions quiz scores (12.50% vs 36.36%, respectively), and a paired t-test showed a significant overall improvement (95% CI 26.89-32.97;  $p < .0001$ ). Student feedback analysis (n=61) revealed overall IC sentiment, "Every PA student should take this course before starting PA studies," vs overall GC sentiment, "I wish I had this training earlier." One-month follow-up survey results revealed application of skills (n=16), including frequency (once, 75%; twice, 25%) and help recipients (friend(s), 87.5%; self, 31.25%; family, 31.25%). 87.5% of respondents who used skills and resources were IC students.

MHFA training was significantly associated with increased mental health knowledge and reduced stigmatising beliefs and attitudes in PA students. In particular, IC students appreciated learning about available resources and practical skills, and more than six times as many IC students reported using the skills and resources learned in the training to connect themselves and others to appropriate help and supports.

**Health and Human Performance Research****Association Between Physical Abuse and Self-harm Behaviors in Adolescents**

Student Presenter(s): Moriah Linkous

Faculty Mentor(s): David Sallee                      Laura Newsome

The purpose of the research is to investigate the relationship between self-reported physical abuse with self-reported self-harm behaviors. A modified version of the Youth Risk Behavior Survey (2017) was used to collect data from 3281 high school students in Southwest Virginia. Survey questions related to the research purpose were compared using odds ratios, crosstabulations, and Chi-Squared analysis. Significant differences ( $p=.01$ ) were found between those that reported abusive behavior and those that reported self-harm behaviors. Those that reported abusive behaviors were 4.1 times more likely to report self-harm behaviors. The result suggests the investigation of self-harm behaviors as a potential warning sign for physical abuse. Additional research is needed to support this conclusion.

**Health and Human Performance Research****Correlation Between Sexual Intercourse and Abuse at a Young Age**

Student Presenter(s): Caitlin Vance

Faculty Mentor(s): Laura Newsome                      David Sallee

The purpose of this study was to examine the correlation between the early onset of self-reported sexual intercourse (between the ages of 11-13) and being physically harmed (that caused a scar, black and blue marks, welts, bleeding or a broken bone) by someone in their family or someone living with them. One research study suggests that maltreatment of children led to early engagement of sexual intercourse and that sexually active adolescents should be questioned for possible abuse as a child (Black, 2009). The Youth Risk Behavior Survey (YRBS) was used to examine the health youth risk behaviors and is organized by the Centers for Disease Control and Prevention. This sample in this study came from anonymous high school students in Southwest, Virginia which was collected in 2020. The students must have been at school when the self-reported surveys were given to be included in this study. Early results suggest that there will be a significant difference between engaging in sexual intercourse if they have been abused by a family member or someone living with them compared to not engaging in sexual intercourse at all. It also shows that they engage in sexual intercourse earlier compared to the older (14-18) age group. Those that reported abusive behaviors were 4.1 times more likely to report engaging in sexual intercourse on or before the age of thirteen. Results will be determined after the collection of the 2020 sample.

### Health and Human Performance Research

#### **The Effect of Pre-Event Flexibility Exercise on Muscle Force Production, Muscle Activation Patterns, and Force Vector Location**

Student Presenter(s): Madison Gaminde

Faculty Mentor(s): David Sallee                      Laura Newsome

The purpose of this study is to evaluate the effects of pre-event flexibility exercise on muscle force production, muscle activation patterns, and force vector location. Research suggests that static stretching immediately before an event decreases performance thru altered muscle force production, altered stretch reflex activity, and a decreased capacity of tendons to store and return force.

Many studies have investigated the interaction between static stretching and muscle force production. Few have investigated force vector locations and muscle activation patterns as a result of static stretching. The goal of this research is to further investigate the impact of static stretching with a focus on alterations in force vector location and muscle activation patterns.

For this study, participants were asked to warm up by walking on a treadmill for three minutes. Immediately after their warmup, FREEEMG 1000 surface EMG wireless probes were attached on their right and left gastrocnemius and tibialis anterior muscles. Next, participants were asked to perform three vertical jump trials on INFINI-T 60 by 40-centimeter force plates. Participants were then asked to stretch the gastrocnemius and soleus complex for three thirty second stretches. Then participants were asked to perform three more vertical jump trials on the INFINI-T 60 by 40-centimeter force plates. Results show that in most cases, the muscle force remains the same, but the muscular activity dramatically decreases.

### Health and Human Performance Research

#### **Predictors of Low Back Pain**

Student Presenter(s): Caitlin Vance

Faculty Mentor(s): David Sallee

The purpose of this research is to determine if muscle activation and force vector patterns are a predictor for back pain. Previous research has suggested differences in lower back activation in people with low back pain and pain-free individuals. Postural evaluation is commonly performed to determine if the joint alignment is playing a role in back pain. This research expands on previous scholarship by looking at symmetry in muscular activation patterns and force vector locations between components of the spinal erector group in a flexion-extension activity. Research suggests that spinal flexion and extension activities can increase the risk for lower back pain. Can this relationship be explained by altered muscle activation patterns between those that have a history of lower back pain and those that do not?

Participants performed a three-minute treadmill walk as a warm-up. Immediately following the warmup, FREEEMG 1000 surface EMG wireless probes were attached to the spinal erectors (Iliocostalis) at the Lumbar 4-5 bony landmark and the Lumber 1 bony landmark. Muscle activation and force vector locations were captured by having participants stand on INFINI-T 60 by 40-centimeter force plates in a standing task and a walking task. The goal was to determine if altered posture or gait mechanisms could be an explanation for back pain. Immediately following, the participants were asked to perform a spinal flexion and extension task. The participants bent at the waist, held the flexed posture for five seconds, and returned to standing via spinal extension. This process was repeated three times while measuring muscular activation patterns and changes in force vector location. Results indicate consistent spinal activation pattern differences between those that have experienced previous back pain and those that have not.

### Health and Human Performance Research

#### **Muscle Activation Patterns and Vector Locations in One-Foot and Two-Foot Jumping**

Student Presenter(s): Matt Wall

Faculty Mentor(s): Dave Sallee

The purpose of the research is to investigate the impact of jumping patterns on valgus force injury risk. Previous research suggests that jumping and landing patterns performed on one foot create higher risk for valgus force mechanical injuries due to reduction in lower leg stability. Additionally, researchers report that valgus forces in combination with tibial torsion are mechanisms of injury for knee ligament structures. Few studies have directly measured muscular activation patterns in combination with mechanical forces to determine if a relationship exists. The goal of this research is to further elaborate on the relationship between jumping patterns, muscle pre-activation, and valgus force mechanical injury risk. Participants performed a prescribed warm-up of three minutes of treadmill walking. Upon completion of the warm-up, FREEEMG 1000 surface EMG wireless probes were applied to the Vastus Medialis and Bicep Femoris for both legs. Participants performed jumping sequences on INFINI-T 60x40 centimeter force plates. Data was gathered on muscular activation patterns and force vectors for jumping and landing using single and double limbs. Preliminary data support that greater valgus force is experienced in single-limb jumping and landing patterns. Muscle activation patterns are inconsistent among participants. The current sample is small (six participants). Further data collection will be completed in January and February 2020. Additional participants may help to establish if there are consistent muscle activation patterns and if a relationship exists between activation patterns and valgus forces at the knee.

**Health and Human Performance Research****Gender and Strength Training Differences for Muscular Pre-Activation Patterns in the Depth Jump**

Student Presenter(s): Moriah Linkous

Faculty Mentor(s): David Sallee                      Laura Newsome

The purpose of the research is to determine if differences exist in muscular pre-activation patterns based on gender and strength training history. Pre-activation patterns were monitored for the Vastus Medialis, Bicep Femoris, Gastrocnemius, and Tibialis Anterior. Participants were further evaluated based on their history of participation in strength training exercises for the targeted muscles. Current research suggests that there are gender differences in injury risk for anterior cruciate ligament injuries. Few studies have been performed on pre-activation patterns influence on anterior cruciate ligament injury risk. This study is attempting to determine if those risks may be partially explained by pre-activation patterns and strength training history. Participants completed a prescribed warm-up of three minutes of treadmill walking. Immediately following the warm-up, the participants performed three depth jumps from an 18-inch platform while monitoring muscle activation patterns using FREEMG 1000 surface EMG wireless probes. Pre-activation was measured using INFINI-T 60 by 40-centimeter force plates. EMG patterns were measured three-thousandths of a second before impact with the force plates while performing the depth jump. Results show gender differences in muscle pre-activation patterns for Biceps Femoris and Vastus Medialis. Females present higher Vastus Medialis activation and males present higher Biceps Femoris activation. Gastrocnemius activation and Tibialis Anterior activation deviated between left and right sides with both genders. Further analysis needs to be done to determine the trends of the lower leg activations.

**Highlander Research Rookies****Surveying COI Primers in specific mock communities for Biodiversity in Aquatic Insects**

Student Presenter(s): Camryn Williford

Faculty Mentor(s): Tara Pelletier

Metabarcoding uses DNA identification to identify the taxonomic groups within an environmental sample, allowing us to target aquatic insects found in freshwater. The identification of species relies on the ability to match the sequences with reference to barcodes for taxonomic identification. The use of specific primers can be used to target the mitochondrial Cytochrome Oxidase I gene (COI), which in most animals is the standard barcode for identification. Quantifying the biodiversity using environmental DNA is often hindered by specificity of the primer. We tested several sets of published COI primers (Leray et al 2013; (Elbrechet and Leese 2015,2017) to determine which would best help us target aquatic insects in SW VA. Ultimately, these efforts in methods development will be used to monitor long-term biodiversity patterns. Five distinct mock communities were constructed from a total of 11 known insects found within the streams of Wildwood Park in Radford. Each mock community was constructed to contain a range of concentrations of DNA from the 11 insects. High and low proportions of DNA for each insect were mixed to replicate the varying mass abundance of species that could be seen in the environment.



Highlander Research Rookies**The Reminiscence Bump Effect in Published Autobiographies**

Student Presenter(s): Hannah Benz                      Grace Flood

Faculty Mentor(s): Thomas Pierce

In autobiographical memory research, the reminiscence bump effect refers to the tendency for older adults to recall more life events from their teens, twenties, and early thirties than from other decades of life. Participants in these studies are often encouraged to recall events quickly and spontaneously (e.g., Schroots, 2003), with the intention of eliciting those life events that come most easily to mind. The purpose of this study was to determine if a reminiscence bump is observed in accounts of life events that are carefully organized and narrated over prolonged periods of time; specifically, those presented in published autobiographies. Life events were collected from the published autobiographies of 16 authors. Four of the authors were female and 12 were male. The mean age of authors at the time of publication was 65.88 (SD = 13.94). 1939 events were identified across the 16 autobiographies. The frequency distribution for the ages of life events obtained from autobiographies was consistent with frequency distributions obtained from laboratory studies supporting the existence of a reminiscence bump effect (e.g., Rubin, 1995). The 15-year reminiscence bump period from 18-32 years of age represents an average of 24% of the length of the authors' lives at the time they published their autobiography; however, events from the reminiscence bump period described in their autobiographies took up an average of 45% of the pages in their books. These data provide evidence for a reminiscence bump effect in carefully considered life story narratives which required months or years to complete.

Highlander Research Rookies**A Music Therapy Protocol for Children with Speech-Language Disorders**

Student Presenter(s): Kirbie Conner

Faculty Mentor(s): Patricia Winter

Radford University's Waldron College hosts and facilitates a summer clinic for children with speech-language disorders. Previous research has supported music therapy methods to help meet goals of speech/language development, however there is little research studying a connection between music therapy methods and other speech/language goals of play-skill development. This past summer, two music therapy students collaborated with speech-language pathologists in taped clinical sessions with children from eighteen months to six years old. They then created a checklist of key goals and behaviors such as peer to peer interaction, movement, vocalization, playing instruments, and leadership to help evaluate the effects of music therapy methods on the children's development throughout the sessions. One music therapy student who was involved in the summer clinic sessions and I watched hours of video data, looking for methods and interventions that support the efficiency of music therapy. The video data was then reviewed using inter-rater reliability by another music therapy student and six speech-language pathology students. From the collected data of the session videos and observers' conclusions we will begin to develop a theory of music therapy protocol for the development of speech-language and play-skill for young children with speech-language disorders, which will establish new practices for professionals in the future.

Highlander Research Rookies**Muscle Activation Patterns and Vector Locations in One-Foot and Two-Foot Jumping**

Student Presenter(s): Matt Wall

Faculty Mentor(s): Dave Sallee

The purpose of the research is to investigate the impact of jumping patterns on valgus force injury risk. Previous research suggests that jumping and landing patterns performed on one foot create higher risk for valgus force mechanical injuries due to reduction in lower leg stability. Additionally, researchers report that valgus forces in combination with tibial torsion are mechanisms of injury for knee ligament structures. Few studies have directly measured muscular activation patterns in combination with mechanical forces to determine if a relationship exists. The goal of this research is to further elaborate on the relationship between jumping patterns, muscle pre-activation, and valgus force mechanical injury risk. Participants performed a prescribed warm-up of three minutes of treadmill walking. Upon completion of the warm-up, FREEEMG 1000 surface EMG wireless probes were applied to the Vastus Medialis and Bicep Femoris for both legs. Participants performed jumping sequences on INFINI-T 60x40 centimeter force plates. Data was gathered on muscular activation patterns and force vectors for jumping and landing using single and double limbs. Preliminary data support that greater valgus force is experienced in single-limb jumping and landing patterns. Muscle activation patterns are inconsistent among participants. The current sample is small (six participants). Further data collection will be completed in January and February 2020. Additional participants may help to establish if there are consistent muscle activation patterns and if a relationship exists between activation patterns and valgus forces at the knee.

Highlander Research Rookies**Dendrochronology in Southwest Virginia**

Student Presenter(s): Nicholas Francis

Faculty Mentor(s): Stockton Maxwell

Dendrochronologists study the past through a unique lens by looking at the response of tree growth to changes in the environment over time. Tree-ring analysis provides more information than simply the age of the tree, they can also record changes in climate and forest disturbance events such as wildfire or insect outbreaks. Our main research question is relatively simple, where we are looking at how three different species of trees from Southwest Virginia respond to change in climate in addition to annual disturbances that may affect how the tree grows. The three species we are working with were cored in Wise County, Virginia. Eastern Hemlock, White Oak, and Yellow Poplar are the sample species for this particular analysis. To work with these core samples, they were first removed from the tree with an increment borer and then mounted, sanded, and scanned into a computer image. The sample were then measured to create a file database that can be put together in a master chronology and then cross-dated. The next step will be to analyze the Hemlock and Oak chronologies and make inferences as to how the trees responded to different climate and weather patterns. Although it may seem like trees are static objects, unphased by what is happening around them, they are recording the ecosystem around them by continuously putting on mass during the growing season and our goal is to unlock that information and make it easier to understand and interpret.

### Highlander Research Rookies

#### **Financial Aid Resources and Communication**

Student Presenter(s): Coleen Maloney

Faculty Mentor(s): Stephanie Bradley

Financial aid knowledge is central to college students' financial wellbeing and can have lifelong implications for an increasing portion of U.S. society. Motivated by an interest to support students' financial wellbeing, our research team asks "What communication channels are most effective in marketing the Radford University Financial Aid Office's training efforts to students?" An original survey measured respondents' familiarity with financial aid resources, frequency of interaction with these resources, communication preferences as it relates to the dissemination of University information, and demographic information. We utilized a non-probability sampling strategy to collect primary data from Radford University students through online networks and in-person promotion. We hope our findings will help maximize the efficacy of the Financial Aid Office's outreach programs. Improving students' knowledge of financial aid will likely support the University's retention efforts by benefiting students' overall financial wellbeing.

### Highlander Research Rookies

#### **Mutagenic analysis of E. coli beta-glucuronidase: Importance of F365 in the bacterial loop in inhibitor binding**

Student Presenter(s): Rayshell Torres-Santana

Faculty Mentor(s): Kimberly Lane

Beta-Glucuronidase, found in humans and E. coli, is a protein that breaks down complex carbohydrates. This protein has been associated with the severe gastrointestinal (GI) side effects associated with administration of some chemotherapeutic drugs, such as CPT-11, for colon cancer. Previous studies have identified several potent inhibitors targeting bacterial beta-glucuronidases to eliminate the GI toxicity of CPT-11; these studies have shown the inhibitor to interact with residues from the enzyme's active site, specifically the phenylalanine in the 365 position (F365). The purpose of this project is to generate mutations on the F365 position in order to see the importance of its interaction with a Z77 inhibitor in beta-glucuronidase. Mutations to the amino acid phenylalanine into leucine, alanine, tyrosine, and tryptophan have been completed, and the effects of the mutations on the enzyme's activity and inhibitor binding will be studied.

### Highlander Research Rookies

#### **Wearable Life: Exploring the Traditional Studio Practices of Photography and Metalsmithing**

Student Presenter(s): Lucas White

Faculty Mentor(s): Alison Pack

This body of studio observation, research, and experiments with digital photography and modern metalsmithing techniques aims to unite these two mediums to unravel the long-held notions of separation and tension between the studio arts, and even elevate both mediums further than they could have reached on their own. By utilizing the fairly novel metalsmithing technique of water-slide decals, taking a digital image, applying it to an enameled glass surface, then firing the enameled surface to adhere the image to the glass, this study is able to provide a creative space for expanding both conceptualization and artistry within the mediums of photography and metalsmithing. Generating not only deeper expansion within the respective mediums, this study creates another pathway in which artists can explore their artwork and personal style without the restrictive history of the separate mediums as an obstacle for inventive development. One way this study has recognized the potential for artistic innovation that combining these two mediums of different dimensionality is the inception of a body of work that produces three-dimensional jewelry highlighted by two-dimensional botanical portraits to communicate the correlation between the human body, augmented by the jewelry, and the plant life, decaled onto the jewelries surface. In this way, this study not only fills the gaps that divorce the mediums of studio art, but even carves a pathway for multi-disciplinary collaboration that results in breaking the traditional limits of the studio arts.

### Highlander Research Rookies

#### **Cosmic Building Blocks: An Infrared View of Dust in Dwarf Galaxies**

Student Presenter(s): Krislyn Sourivong

Faculty Mentor(s): Sandra Liss

Low mass dwarf galaxies are the most common type of galaxies throughout the universe and interactions between them may be the building blocks of more massive galaxies like our own Milky Way. Despite their prevalence and importance, not much is known about interactions between these galaxies compared to their more massive counterparts. One particularly open question related to dwarf galaxy interactions involves whether or not these interactions are the driving force behind their observed enhancement in their [3.6] - [4.5] color. Here we present Spitzer Space Telescope observations of 60 isolated interacting pairs of dwarf galaxies from the TiNy Titans survey, the first systematic study of low mass galaxy interactions. In addition to determining the infrared colors of these galaxies, we analyze how they compare to other classes of galaxies and how these colors vary as a function of galaxy and pair properties.

Highlander Research Rookies**Efficacy of Repeated Intravenous Ketamine Infusion for Treatment-Resistant Depression; a Systematic Review**

Student Presenter(s): Liv Morka

Faculty Mentor(s): Matthew DeCarlo

While some in some patients' depressive symptoms may reduce within three to six weeks after starting conventional antidepressants, one-third of patients are considered to be treatment resistant failing to receive benefits from these medications (1). For this patient population, options are often limited, slow-acting, and unsuccessful. In the past two decades the N-methyl-D-aspartate receptor antagonist, Ketamine, has been explored for its rapid antidepressant properties. With evidence supporting the benefits of Ketamine as a single use rapid antidepressant, in particular for patient populations with acute suicidality. Since this discovery the concept of using Ketamine as a repeated treatment for depressive disorders as become increasingly more popular. The pathophysiology of depressive disorders is often linked with a monoamine deficiency and increased glutamate levels, which suggests that N-methyl-D-aspartate receptors (NMDAR) could also be an effecting factor due to its integral roles as a glutamate receptor (2,3). As Ketamine is a NMDAR antagonist and its effect with glutamate this could explain its rapid anti-depressant effect. Due to this pathophysiology response ketamine has been successful in the treatment of depressive disorders in emergency settings and increasingly as a treatment option (1,4). This systematic review studied 26 publications to analyze the efficacy of repeated intravenous ketamine on depressive symptomatology in adults with Treatment Resistant Depression.

Highlander Research Rookies**Mindfulness and Meditation**

Student Presenter(s): Makayla Martinez

Faculty Mentor(s): Whitney Idol

A general increased interest in social and emotional well-being has been present in schools for years now. In 2012 the Collaborative for Academic, Social and Emotional Learning in the USA set aside seven million dollars to support the development of programs and curriculum that would support social-emotional learning (Wickelgran, 2012 as cited by Waters et al., 2015). Schools and residential programs quickly began their efforts to develop mindfulness and meditation programs and procedures. While these social and emotional well-being practices are being considered, special educators must follow additional mandates such as IDEA (2004), that requires the use of evidence-based practices when at all possible. In this literature review, mindfulness and/or meditation implemented across grades pk-12 in the instructional setting were reviewed. Specific areas such as methods of design, participant grade levels, independent variables, dependent variables, and results are identified. Additional review of these studies in accordance with the quality indicators set forth by the Council for Exceptional Children (CEC) will be discussed.



Psychology Research**Strategic Learning: The Role of Testing and Feedback on Study Strategy**

Student Presenter(s): Morgan Shumaker                      Hailey Scherer                      Felix Smith

Faculty Mentor(s): Kathleen Arnold                      Catherine Middlebrooks

When studying material, students must make decisions that will optimally maximize their test performance. Factors such as time constraints and perceived difficulty of material play a role in what students decide to study. If studying with a goal of efficiency, students should selectively prioritize the most important items (i.e., the items of highest value). When studying multiple word lists, with tests followed by feedback after each list, students learn to become more selective with task experience. Such interim testing enhances learning of subsequent study material by sustaining students' attention. In the current study, we examined the independent roles of testing and feedback on how students learn to study selectively. Participants were presented with six lists of 20 words, presented individually for a total of 60 seconds per list. Each word was paired with a value worth 1-10 points. Participants received either a test with feedback after each list, a test with no feedback after each list, one test after List 3 and 6, or no tests until List 6. There was an effect of testing on List 6 recall such that more items were remembered following interpolated testing. Moreover, there was a significant effect of value on List 6 recall 'with greater recall of higher-valued items' though there were no condition differences in selectivity. Data collection is ongoing and, with more power, current trends may prove significant.



### Psychology Research

#### **Pluralistic Ignorance: A Conceptual and Historical Overview**

Student Presenter(s): Hayley Grossman Carly Pullen Caelan King  
Kailynn Harris

Faculty Mentor(s): Jeff Aspelmeier

Pluralistic ignorance (PI) occurs when group members misestimate group norms regarding the ideas, feelings, or actions of others, and when group members feel pressure to conform to the false norm. The resulting mismatch between public behaviors and private attitudes serve to further exacerbate misperceptions about the groups' true norms (O'Gorman, 1986; Lambert et al., 2003). Research on pluralistic ignorance has its origins in F. H. Allport's (1924) *Social Psychology* textbook, which outlined the concept of the impression of universality - the tendency for group members to overestimate the unanimity of the group. The investigation of the impression of universality gave rise to research on PI, which was first coined by Katz and Allport in 1931 (as cited in O'Gorman, 1986). Among other attitudes, Katz and Allport measured attitudes of fraternity members toward admitting minorities into their fraternities. Although members endorsed positive private attitudes toward admitting certain minorities to the fraternity, they also indicated publicly that they would not do so because it would damage the reputation of the fraternity - a mismatch between private attitudes and public behaviors. Though other early studies found support for PI, it largely went unstudied between the 1930s and the 1960s. Research on PI reemerged when Breed and Ktsanes (1961) investigated attitudes toward desegregation, which began a surge of interest on the topic up through the 1990s. The current research on PI investigates topics such as academic integrity (Halbesleben et al., 2010), college attitudes (e.g., hookups; Lambert et al., 2003), and political topics (e.g., climate change; Geiger & Swim, 2016).

Psychology Research**The role of Attachment as a Moderator of Effects of Childhood Polyvictimization on Psychological Function**

Student Presenter(s):	Hanna Hatfield	Kelsey Frank	Salena Diaz
	Katelynn LaCombe	Hayley Grossman	Carly Pullen
	Autumn Buckler	Maggie Todd	Mia Purcell
Faculty Mentor(s):	Jeff Aspelmeier	Thomas Pierce	Ann Elliott

The present study utilizes a model of moderation to examine whether adult attachment in security buffers the association between retrospective reports of childhood polyvictimization and self-reports of current psychological symptomatology. The sample consists of 216 first semester college women. Polyvictimization is a condition characterized by the accumulations of different forms of victimizations experienced by one individual over time (Finkelhor et al., 2005). Attachment anxiety and avoidance in adulthood represent an aversion to abandonment and an aversion to closeness and a resistance to dependency, respectively (Brennan, Clark, & Shaver, 1998). Insecure attachment is thought to negatively impact an individual's ability to cope with life adversities. Attachment anxiety significantly moderated the negative effects of polyvictimization. Participants reporting high polyvictimization and low attachment security (high anxiety or high avoidance) also report the highest levels of symptomatology. Participants reporting high polyvictimization, but greater attachment security reported substantially lower levels of psychological distress than their polyvictimized peers. It is important to note that attachment security does not completely eliminate the negative effects of polyvictimization.

Psychology Research**Attachment and Resilience Moderate the Relationship between Negative Life Events and Psychological Functioning**

Student Presenter(s):   Hanna Hatfield                   Autumn Buckler                   Maggie Todd  
                                   Salena Diaz                         Katelynn LaCombe               Carly Pullen  
                                   Mia Purcell

Faculty Mentor(s):       Jeff Aspelmeier                   Ann Elliott

A longitudinal study examines the role of adult attachment and resilience as buffers of the effects of negative life events on psychological functioning. Specifically, the study tests whether attachment and resilience may moderate the relationship between negative life events occurring within the first semester of college and psychological functioning assessed at the end of the first semester of college. The sample consists of follow up data from 89 of 219 first semester college women. In the first phase of the study, participants completed measures of attachment, resilience, and psychological functioning. In the follow up portion of the study, participants completed measures life adversity and psychological symptomatology. Hierarchical Multiple Regression moderation models were used to evaluate the interactions between the variables. It is expected that associations between negative life events and severity of psychological symptoms will be stronger among participants with lower attachment security, compared to associations found among participants with greater attachment security. Similarly, it is expected that associations between negative life events and severity of psychological symptoms will be stronger among participants with lower levels of resilience related assets, compared to associations found among participants with higher level of resilience related assets.



Psychology Research**Resilience Related Assets Moderate the Effects of Childhood Polyvictimization on Psychological Functioning**

Student Presenter(s):	Kelsey M. Frank Hayley J. Grossman Autumn Buckler VaNeace M. Richardson-Lober	Hanna R. Hatfield Katelynn A. LaCombe Maggie K. Todd	Salena M. Diaz Carley E. Pullen
Faculty Mentor(s):	Jeffery E. Aspelmeier	Thomas W. Pierce	Nicholas Lee

The present study tests whether resilience-related assets significantly moderate the relationship between retrospective reports of childhood polyvictimization on psychological functioning. Childhood/adolescent polyvictimization refers to one's exposure to multiple types of victimization, prior to the age of 18 (Finkelhor et al., 2007). Those who have experienced polyvictimization are especially susceptible to negative life outcomes as children (Cyr et al., 2017) and as adults (Elliott et al., 2019), including the increased risk of future victimization (Finkelhor et al., 2007) and development of psychological symptomatology. Resilience is a fluid process that is demonstrated when individuals are exposed to risk factors (i.e., adversity or trauma) but avoid experiencing the negative outcomes typically associate with such risk (Fergus & Zimmerman, 2005). To date, no previous work has investigated the combined role of polyvictimization and resilience-related factors in predicting psychological functioning outcomes in late adolescence and early adulthood. A total of 219 freshman women were recruited through the psychology department participant pool and completed online measures to assess polyvictimization (Hamby et al., 2007), resilience-related assets (Prince-Embry, 2007), and psychological symptoms (Derogatis, 1994). Data analysis revealed that resilience-related assets (mastery, sense of relatedness, and emotional reactivity) significantly moderated the negative effects of polyvictimization. Specifically, polyvictims who had high resilience scores had lower levels of psychological symptomology compared to polyvictims who had low resilience scores, who had higher levels of psychological distress.



Psychology Research**Celebrity Influence on Stigma of Mental Health Disorders and Seeking Treatment**

Student Presenter(s): Carly Pullen                      Katelynn LaCombe                      Hayley Grossman

Faculty Mentor(s):        Nicole Iannone

Depression and anxiety are the two most commonly experienced and diagnosed mental health disorders in America today (DuBois-Maahs, 2018). Mental health is frequently stigmatized and negatively portrayed in mass-media. As of recently, there has been a push for moving away from stigmatizing of mental health disorders, as more celebrities come out with their personal stories. Research by Martin et al. (2019) found that individuals viewed mental health diagnosis and treatment as less damaging when a role model talked about them at a personal level. This study is interested in exploring how people feel about mental health disorders and seeking treatment. We want to examine whether celebrities have an effect on how individuals view and stigmatize depression and anxiety disorders. We would also like to investigate whether a celebrity's influence affects an individual's view or stigmatization towards seeking help through therapy. Participants will be randomly assigned to view a commercial clip from the TalkSpace app that portrays either a celebrity or average people, or no clip. Then, participants will be prompted to answer a series of questions regarding their attitudes toward depression and anxiety, as well as attitudes towards seeking help for mental health. We expect to find that participants who view the celebrity clip will endorse fewer negative stigmatized attitudes towards mental health and seeking treatment, compared to those who view the non-celebrity or no clip conditions. This study can provide insight into how a celebrity can influence people's attitudes towards mental health disorders and treatment.

Psychology Research**An investigation of the role of FOMO on decisions**

Student Presenter(s):    Hanna Hatfield

Faculty Mentor(s):        Nicole Iannone

FOMO is understood as a social phenomenon involving a feeling of anxiety surrounding the idea that others are experiencing an event or favorable interactions of which you are not a part of (Wang et. al, 2018). To date, the body of research dedicated to the fear of missing out is still limited. In a previous study, FOMO was found to be significantly correlated with neuroticism, Instagram use, self-esteem, and various behaviors aimed at alleviating anxiety in regard to feeling excluded. The present study will build on these findings by utilizing hypothetical scenarios based in the behaviors assessed in the previous study. We hypothesize that in individuals exhibiting higher rates of FOMO, the prevalence of engaging in such behaviors will be higher. Participants will be recruited from an online psychology survey research website and will complete measures of social media use, self-esteem, personality characteristics, and FOMO, in a randomized order following presentation of different scenarios of behavior (e.g., spending money on products and experiences, missing sleep, neglecting responsibilities). Correlations will be used to evaluate the relationships between scores on personality traits, FOMO, social media use, and likelihood of behaviors.

Keywords: personality, self-esteem, social media, FOMO, behavior



### Psychology Research

#### **The Effects of Chlordiazepoxide on Motor Activity in Rodents**

Student Presenter(s): Hope Davis Alana Rosa

Faculty Mentor(s): Pamela Jackson

The growing prevalence of anxiety in society has led to an attempt to manage the disorder by prescribing anxiolytic medication, with the common drugs being benzodiazepines and selective serotonin reuptake inhibitors (SSRI). The purpose of this research is to observe the effects anxiety medication has on motor activity. For this study researchers will be observing motor activity in two test groups of rodents. The experimental group will be given an injection of Chlordiazepoxide (CDP), a benzodiazepine commonly known as Librium. This study will focus solely on the effects of chlordiazepoxide opposed to SSRIs, as it takes weeks to see medically significant changes in behavior from SSRIs. The control group of the experiment will be given an injection of saline. The injections will be administered 40 minutes prior to the rats performing two separate tasks, one week apart. Elevated-Plus-Maze (EPM) and open-field (OF) tasks are standard tasks used to measure anxiety in rats. Researchers will be examining performance on these mazes to observe the differences in motor activity for the two treatment groups by measuring the total distance traveled and average speed of locomotion. The groups for the study will be 40 female Long-Evans rats, classified in three categories: Young -Na<sup>+</sup>-ve (N=12), Older -Na<sup>+</sup>-ve(N=14), and Older-Breeder(N=14). It is hypothesized that the group exposed to the Chlordiazepoxide injection will show lower motor activity and more lethargic behavior in comparison to the group subjected to the saline treatment.

Psychology Research**Mind Wandering in Depressed Individuals before and after Mindfulness Training**

Student Presenter(s): Alana Rosa

Faculty Mentor(s): Catherine Middlebrooks

Depressed individuals are known to suffer from rumination and negative thoughts, generally spending more time thinking about the past rather than focusing on what they are currently engaged in (Hoffman et al., 2016). When one is unable to keep their thoughts focused on the task at hand, it can be said that their mind is wandering. Mindfulness-based Stress Reduction (MBSR) is a technique that has been used to reduce mind wandering in healthy individuals (Mrazek et al., 2013), however, the researchers also noted that those who were more prone to mind wandering before intervention benefitted more from the intervention than those who were not as prone to mind wandering. MBSR has also shown to be effective in reducing symptoms of depression (Geschwind et al., 2011) though mind wandering itself has not specifically been examined. This proposed study would look at the rate of mind wandering in depressed individuals compared to healthy controls before and after either yoga-based training or mindfulness training. Yoga and MBSR are often thought of as similar/overlapping constructs however, mindfulness contains the component of monitoring ones thoughts and keeping them focused on what is currently going on, rather than past or future events. It is expected that depressed individuals will mind wander significantly less after mindfulness training when compared to yoga-based training and that depressed individuals will mind wander significantly less after mindfulness training when compared to healthy controls.

Psychology Research**Gender Differences in Tolerance of Infidelity.**

Student Presenter(s): Carly Pullen

Faculty Mentor(s): Catherine Middlebrooks

Alexopoulos & Taylor (2020) suggested that people may use television shows as a way to influence or model their relationship. Infidelity, as defined by Alexopoulos & Taylor (2020), refers to behaviors that violate a couple's expectations and norms about the level of exclusivity of the relationship. This study plans to assess if there is a difference in tolerance levels towards infidelity, influenced by the gender of the perceiver and gender of the offender when exposed to infidelity through television media. Previous research by Shackelford, Buss, & Bennett (2002) found differences in the way men and women respond to acts of infidelity, committed by their partner. For this study, participants will be randomly assigned to view a video clip of either a male cheating on a female or a female cheating on a male. After which participants will respond to a series of questions about the video clip and their attitudes towards infidelity. It is expected that female participants endorse a higher tolerance towards males sexually cheating on females, compared to females cheating on males. It is also expected that males will have a lower tolerance for females sexually cheating on males, as opposed to males cheating on females. This proposed study would add to the literature and understanding of infidelity.

Psychology Research**Combined Effects of Cognitive Behavioral Therapy and Stimulant Medication on ADHD Symptoms in Children**

Student Presenter(s): Katelynn LaCombe

Faculty Mentor(s): Catherine Middlesbrooks

Cognitive behavioral Therapy (CBT) is a commonly used and effective practice in treating symptoms of Attention Deficit Hyperactivity Disorder (ADHD) (Young et al. 2015) as well as Methylphenidate stimulate medication (Schachar et al. 1997). These practices are beneficially to children when paired together. When applying this strategy of treatment to adults with ADHD, there is no difference in whether you are getting CBT, stimulant medication or both treatments combined (Philipsen et al. 2015; Weiss et al. 2012). This proposed study therefore aims to explore whether CBT combined with medication reduces the most symptoms for ADHD in children with potential long lasting results. The participants will be recruited from elementary schools throughout Virginia. Those participants with high amounts of ADHD symptoms will be included in this study. The children will be put into one of four groups; CBT and no medication, CBT and medication, no CBT and medication, and no CBT and no medication. Participants who receive CBT during the experiment will be in it for 20 weeks. Those receiving medication will receive 5 mg of Ritalin with a maximum dosage of 25 mg by the end of the 20 week intervention. A full evaluation of symptoms will be conducted before the experiment, right after medication and CBT treatment, and a month after CBT and medication has ceased. With this design, results are predicted that CBT combined with medication will be significantly more effective in reducing ADHD symptoms than CBT and medication alone.

### Psychology Research

#### **The Reminiscence Bump Effect in Published Autobiographies**

Student Presenter(s): Hannah Benz                      Grace Flood

Faculty Mentor(s):        Thomas Pierce

In autobiographical memory research, the reminiscence bump effect refers to the tendency for older adults to recall more life events from their teens, twenties, and early thirties than from other decades of life. Participants in these studies are often encouraged to recall events quickly and spontaneously (e.g., Schroots, 2003), with the intention of eliciting those life events that come most easily to mind. The purpose of this study was to determine if a reminiscence bump is observed in accounts of life events that are carefully organized and narrated over prolonged periods of time; specifically, those presented in published autobiographies. Life events were collected from the published autobiographies of 16 authors. Four of the authors were female and 12 were male. The mean age of authors at the time of publication was 65.88 (SD = 13.94). 1939 events were identified across the 16 autobiographies. The frequency distribution for the ages of life events obtained from autobiographies was consistent with frequency distributions obtained from laboratory studies supporting the existence of a reminiscence bump effect (e.g., Rubin, 1995). The 15-year reminiscence bump period from 18-32 years of age represents an average of 24% of the length of the authors' lives at the time they published their autobiography; however, events from the reminiscence bump period described in their autobiographies took up an average of 45% of the pages in their books. These data provide evidence for a reminiscence bump effect in carefully considered life story narratives which required months or years to complete.

Psychology Research**Time-Frequency Analysis of EEG During a 75-Minute Class**

Student Presenter(s): Devon Viar                      Taylor Hiatt                      Brayden Bradbury  
    Lauren Buynack

Faculty Mentor(s):      Thomas Pierce

This study investigated cycles in EEG activity indicative of cognitive engagement across 75-minute lecture-based classes. EEG records were obtained from nine participants during a class beginning at 8 AM and from 12 participants during a class beginning at 12:30 PM. Three-second segments of artifact-free EEG were extracted every five minutes throughout each 75-minute recording for a total of 16 segments for each participant. A spectral analysis was performed on each EEG segment to calculate the degree to which each detectable frequency between 1 and 50 Hz was present. To determine the relative contributions of slow and fast wave frequencies to full EEG waveforms, the values for frequency and power were converted to logarithmic units. We used linear regression to predict the log of power from the log of frequency. We used the slope of this regression line as our measure of the degree to which high frequency waves were present in an EEG segment, relative to the presence of slow frequency waves. Slopes of plots of the log of frequency against the log of EEG power were calculated for EEG segments obtained every five minutes across the 75-minute class period. For students in the 8 AM class, cycles of steep (less high frequency activity) to shallow (more high frequency activity) to steep slopes were completed every 20 minutes. In particular, students were engaged with the material 30 and 50 minutes after start of class, but experienced a decline in cognitive engagement 40 minutes into the 75-minute class.

Psychology Research**Time Frequency Analysis of EEG Recorded During a 12-minute Instructional Video**

Student Presenter(s): Katelynn LaCombe                      Emilie Hammed                      Autumn Buckler

Faculty Mentor(s):      Thomas Pierce

Smith et al. (2003) identified two cycles of lower attention around the two- and five-minute periods during a 30-minute continuous performance task. Arruda et al. (2009) also observed the same two and five-minute cycles during the presence or absence of higher frequency of EEG activity during the same 30-minute task as Smith and colleagues in 2003. The purpose of this study is to examine to what extent cycles during two- and five-minute periods of an EEG activity recording will be present while students watch an instructional video. The instructional video is estimated to be the same length as expected of a typical online instructional lecture. We are recording EEG while participants watch a 12-minute Kahn Academy video about "The Triboelectric Effect". We will be using three-second segments of artifact-free EEG obtained every minute throughout the video to conduct our analysis. We are using a time-frequency analysis to detect periods of time where cycles can be present within the recorded EEG activity. Participants are being recruited for course-specific extra credit through the Psychology Department. Ideally, a sample size between ten and twenty participants will be collected for our participant pool. We predict that around the two- and five-minute periods of the recording, we will see regular cycles. This would indicate that during the second and fifth minute of the lecture students are not sustaining attention as they were during the other parts of the lecture.

Psychology Research**Francis Sumner: The First African American Psychologist**

Student Presenter(s): Victor Bullock

Faculty Mentor(s): Ruth Riding-Malon

The history of psychology often includes discussions of William Wundt, Edward Titchener, G. Stanley Hall, William James, Sigmund Freud, Philippe Pinel, and B.F. Skinner. These psychologists are noted for their contributions to the field of psychology, but little attention is often afforded to minority psychologists who also influenced the field of psychology. It would take 42 years after the first Ph.D. in psychology was awarded to G. Stanley Hall, for the first African American, Francis B. Sumner to earn a doctorate in psychology in 1920. Sumner would go on to have a prestigious career teaching at several institutions, perhaps most notably Howard University. However, discussions of Sumner's career that fail to place his achievements into social and political contexts, neglect a major component of his experience. This poster will provide an overview of Sumner's life and accomplishments within these contexts. Emphasis will be given to two controversial writings of Sumner's "The Philosophy of Negro Education" and "Morale and the Negro College" to demonstrate how Sumner's research was likely influenced by the sociopolitical climate and Sumner's experiences. Finally, Sumner's legacy will be detailed including his students who would go on to influence the structure of the public-school system in the United States through their research.

Psychology Research**A Historical Review of the Life of Alfred Kinsey**

Student Presenter(s): Carly Pullenn

Faculty Mentor(s): Ruth Riding-Malon

Alfred C. Kinsey was a biologist and sex researcher during the mid-1900s. Originally studying the biology of the Gall wasp, Kinsey took on a teaching position at Indiana University. During his career there, Kinsey volunteered to teach a class on family and marriage. As part of the class, he required his students to be interviewed about their sexual history, as well as their attitudes and opinions. This was also a time for students to ask questions and discuss topics they were too shy to talk about in class. Two years after teaching the class, Kinsey decided to stop teaching so he could pursue his research on sex. Through interviewing thousands of people on their sexual behaviors and past, Kinsey was able to report more accurate statistics about human sexuality. Kinsey published his first book on sexuality, "Sexual Behavior in the Human Male" in 1948. Within this book was the Kinsey Scale, a scale designed to explain the variations of heterosexual and homosexual a person can be. A few years later he published "Sexual Behavior in the Human Female." At which point Kinsey became a household name. His work inspired controversy at the time, but Kinsey was about to break down barriers about human sexuality.

### Psychology Research

#### **What is This, a Crossover Episode? Connecting Netflix's "Bojack Horseman" with Attachment Theory**

Student Presenter(s): Salena Diaz

Faculty Mentor(s): Ruth Riding-Malon

Attachment theory, as described by Bowlby and Ainsworth, initially focused on the relationships between infant children and their primary caregivers (Bretherton, 1992; Altman et al., 2017). Early research on these relationships categorized the three commonly viewed attachment styles as secure, anxious-ambivalent, and avoidant; and suggested that they serve as the basis for future romantic relationships (Bretherton, 1992; Hazan & Shaver, 1987). More modern work, however, has since incorporated additional attachment styles, (Bartholomew & Horowitz, 1991; Fraley et al., 2000), considered evolving attachment styles (Davila et al., 1997), and accounted for the effects of parasocial relationships (Silver & Slater, 2019). Attachment theory has also permeated into popular culture. The Netflix series *Bojack Horseman* tells the story of an anthropomorphic horse named Bojack Horseman who used to star in a successful 1990s sitcom. Over the course of the show's six seasons, viewers are given insight to Bojack's upbringing with neglectful and abusive parents, and his subsequent friendships and romantic relationships. The purpose of this poster is to apply concepts proposed by attachment theory to the relationships of Bojack Horseman, and to provide examples from the show supporting these interpretations. Through my analysis of Bojack's character, I suggest that his negative parental relationships but positive parasocial relationships with his fictional sitcom family and other television idols show Bojack with both high levels of avoidance and high levels of anxiety in relationships (Silver & Slater, 2019). Thus, the character is left vacillating between preoccupied and dismissing attachment styles (Bartholomew & Horowitz, 1991).

### Psychology Research

#### **Inez Beverly Prosser: The First African American Female Psychologist**

Student Presenter(s): Carline Bien-Aime

Faculty Mentor(s): Ruth Riding-Malon

As the first African American woman to earn a doctoral degree in Psychology, Inez Beverly Prosser was an important figure in examining the education of African Americans during segregation. Prosser lived during the 1900s, when school opportunities for African Americans were extremely limited to non-existent in some towns. Prosser excelled in school, but often was required to relocate to attend a black school. After earning a Bachelor of Arts degree in Education with minors in English and Psychology, Prosser commenced her dissertation work in 1931 at the University of Cincinnati. She observed the comparisons of personality, interests, social skills, and activities of Cincinnati African Americans in segregated and mixed schools. Her study concluded there were differences between the two groups, though of small statistical value. Prosser believed African American students would be better off psychologically in voluntary segregated schools because they would not have to face racial inferiority that is explicitly experienced in mixed schools (Prosser, 1933a). Prosser's study was reviewed and critiqued by many professionals in the field, whom believed her conclusions would provide ammunition for those pro-segregation as well as further enforce feelings of racial inferiority in black youth by being separated (Long, 1935). New scientific evidence from psychologists Mamie and Kenneth B. Clark (1939,1940) supported the opinions of Prosser's critics and was utilized to successfully go against Plessy v. Ferguson's separate but equal law. Ultimately, rendering segregated schools illegal in the US Supreme Court case, Brown v. Board of Education (Brown v. Board of Education, 1954).

### Psychology Research

#### **A Historical Overview On The Life & Influence Of Erik H. Erikson**

Student Presenter(s): Celie McKinley

Faculty Mentor(s): Ruth Riding-Malon

Erik Erikson is a prominent and influential psychologist; much of his work is associated with social psychology specifically with regard to personality development throughout the lifespan (Forsey et al., 2015). The current poster is a summary of Erikson's personal life and significant contributions and influence that ignited and paved the way for his work in social psychology. Often when speaking about Erikson, his contribution to the development of individual identity is emphasized, but there is so much more to his story. In the beginning, while in Vienna, Erikson had ties to Sigmund Freud and his daughter, Anna (Boeree, 2006; Shamdasani, 2001). He became interested in their work with psychoanalysis and eventually underwent training to become a psychoanalyst. Erikson's interest led to many publications in which he projected his focus toward the development of the psychosocial stages that drew inspiration from Freud's psychosexual stages (McLeod, 2018). Erikson met his wife, Joan, in Vienna; they had three children (Coles, 1970). They later moved due to the Nazi government in Germany (Boeree, 2006). The family ended up in Boston where Erikson was offered a position at Harvard Medical School where he continued to practice psychoanalysis with children. After Harvard, Erikson taught at Yale University and the University of California at Berkeley. He eventually left Berkeley and ended up working and teaching at a clinic in Massachusetts before returning to Harvard. After his retirement in 1970, he and his wife conducted research up until his death in 1994 (Boeree, 2006).

**Psychology Research****A Historical Review of the Life and Influence of B. F. Skinner**

Student Presenter(s): Kelsey M. Frank

Faculty Mentor(s): Ruth Riding-Malon

B. F. Skinner was one of the most influential psychologists in the field and is still widely recognized today for his achievements in behavioral psychology. The present poster details Skinner's personal life, from his childhood years through adulthood, which largely influenced his interest for human behavior and his developments in the field. Additionally, the present poster outlines the influence Skinner had on psychology as a developing science, and his role in behaviorism. Skinner's life story is an inspirational one. His undergraduate degree and interests were unrelated to the work he is most famously known for in psychology, yet it played a significant role in the contributions he would later make in his field. Upon graduating from college with a degree in English Literature, he took a year off and began writing, unsuccessfully, about human behavior. During what he calls the "dark years", he was living at home trying to make progress as a writer, and his parents were concerned about his lack of a job (Moore, 2008). Skinner immersed himself in literature progressive social criticisms, modernist literature, philosopher Bertrand Russell, Francis Bacon, Pierre Duhem and others, who inspired him to study behavior scientifically (Moore, 2008). That fall, he enrolled in a psychology Ph.D. program at Harvard University; it was there that he had the tools and opportunities to publish books, invent, combine principles of biology with psychology, establish a new framework of behaviorism, and much more. Many people dream of having a career like Skinner. At the end of his career, the American Psychological Association awarded him with the Lifetime Achievement Award, just 10 days before his death, acknowledging his legacy.

**Psychology Research****A Historical Review of the Influence of Gordon W. Allport**

Student Presenter(s): Hanna Hatfield

Faculty Mentor(s): Ruth Riding-Malon

Gordon Allport (1897 - 1967) was born in Montezuma, Indiana and is the younger brother of renowned psychologist Floyd Allport ("Father of Experimental Social Psychology"). Gordon is most well-known for his influential work in the field of Personality Psychology. The current review focuses on his early professional life, education, main contributions, and lasting influence within his field. Gordon obtained degrees in Psychology and Social Ethics from Harvard University in 1919 (Bachelor's) and 1922 (Ph.D.). He studied with many other influential psychologists, including Wolfgang Kohler and William Stern, during his years in Europe. He served as a faculty member at Harvard University from 1930 until his death in 1967 and is thought to have taught the very first American college course on personality (Engler, 2014). Gordon's main contributions to the field of Personality Psychology include the idea of functional autonomy and trait theory, outlining three distinct categories of personality traits. His influence was confirmed by the American Psychological Association as he was ranked number 11 of the list of 100 most distinguished psychologists of the 20th Century.

Keywords: Allport, Personality, Trait theory

### Psychology Research

#### **The Myers-Briggs Type Indicator: A Modern Appraisal**

Student Presenter(s): Mandy DeCarlo

Faculty Mentor(s): Ruth Riding-Malon

Personality psychology has undergone numerous paradigm shifts throughout the history of the field. The Myers-Briggs Type Indicator (MBTI) is just one of many self-report instruments that emerged during a movement towards more structured personality assessments. The MBTI was created by personality researcher Katharine Cook Briggs and her daughter Isabel Briggs Myers; the mother-daughter research team constructed the measure based on theories proposed by Carl Jung, an influential figure in analytical psychology. Although the MBTI became highly popular, its reputation in the scientific community is comparable to that of astrology. The instrument's usefulness is largely discounted due to criticisms of its psychometric properties. The present poster aims to examine both critiques of the measure as well as utility it may still have in counseling as an exploratory tool.

### Psychology Research

#### **Preserving Memories Through Auditory And Visual Reminiscence**

Student Presenter(s): Alison Williams

Faculty Mentor(s): Thomas Pierce

This semester in order to study reminiscence I met with an older adult to record stories from his personal history. He is 93 and lives independently. He recently moved to the area to be closer to family. During the semester, we met at his home once a week for approximately 75 minutes each meeting. His son also participated in the sessions because he wanted to learn more about his father's personal history and because he thought he could guide and prompt his father to recall additional details for his life stories. I transcribed audio recordings of the sessions to produce an article-length document containing stories about his life and which included photographs of family members and places he has lived or visited. The participant had a chance to review the document and make suggestions for how to organize and present the materials. We will provide the participant and his family with audio files of our sessions and with copies of the completed document.

Psychology Research**"Let's Talk About Sex": The paradigms and assumptions established by the father of behavioral endocrinology**

Student Presenter(s): Lauren Buynack

Faculty Mentor(s): Ruth Riding-Malon

In Kuhn's writing on the Structure of Scientific Revolutions (1962), Kuhn lays out a framework and argument about the structure of scientific discoveries and breakthroughs. One such framework Kuhn describes is that of the paradigm. Taken on a small scale, a paradigm is a set experimental task or test that a field of study at large accepts and uses to test a set construct. Taken on a larger scale, a paradigm is an assumption or a set of assumptions that a field of study at large accepts and assumes to be true in order to test questions surrounding a topic. Within the field of behavioral neuroscience and neuroendocrinology, researchers who study sexual behaviors and the phenomena surrounding those behaviors look to the paradigms or assumptions that Dr. Frank Beach created. In Beach's attempt to escape psychology, he looked to behavioral paradigms and physiological phenomena. Dr. Beach is regarded as the father of modern behavioral endocrinology and has an h-index of 33 with over 4000 citations. Throughout his career, Dr. Beach studied reproductive mating behaviors across a wide variety of species including rats, chinchillas, dogs, hyenas, and humans. Fundamental paradigms that Dr. Beach established and that will be discussed in the poster are the estrous cycle, consummatory behaviors such as lordosis, post-ejaculatory intervals, intromissions and other mounting behaviors, as well as a wide variety of sexual interest behaviors including anal investigation, female receptivity versus non-receptivity, and proceptivity.

### Psychology Research

#### **Impact of Media on Endorsing Aging Stereotypes**

Student Presenter(s): Carly Pullen                      Hayley Hadock

Faculty Mentor(s):        Jenessa Steele

Ageism is defined as the stereotyping and prejudices held toward older adults and the aging process (Butler, 1969). Across the literature, an older adult refers to as anyone over the age of 65. Research suggests that people stigmatize older adults in both positive and negative ways, which provides the basis for stereotypes to arise. The golden section hypothesis suggests that people assign adjectives to others in an asymmetrical way, where positive adjectives are usually assigned 61.8% of the time (Adams-Webber, 1977). However, Widrick and Raskin (2010) found reversed results when participants were asked about older adults, they assigned negative adjectives such as impaired, fragile, and needy 60.5% of the time. Concurrently, Fiske, Cuddy, and Glick (2007) found that older adults are most often categorized as warm and incompetent. In the present proposed study would like to examine how media from popular television shows the influence and affect how people feel towards older adults. Participants will be randomly assigned to view either a stereotype congruent or stereotype challenged clip from a popular TV show or no clip. The stereotype challenged condition will show older adult characters as warm and active, while the stereotype congruent condition will show older adult characters as frail or incompetent. After viewing the TV clips participants will answer a series of questions regarding the stigmatization of older adults. It is expected that those who view the stereotype congruent clips will endorse more stereotypes about older adults, while those who view the stereotype challenged clips will endorse fewer stereotypes.

### Spring BFA Show

<https://portfolium.com/entry/radford-university-bfa-show>



### Spring BFA Show

#### **Natavis Barton Artitst's Statement**

Patterns and shapes excite my imagination. I am interested in the ways I can manipulate the form of patterns and shapes. Initially, shapes come at their most basic form and are two dimensional. I explore these shapes on paper transforming them into various configurations. I look for potential outcomes. What excites me at this point is the choices of different mediums and materials that can enhance these formations. I use various mediums such as cold wax, paper, ink and paint to collage and print. The control I have with block printing, contrasting with collage and cold wax painting makes the process of my work feel like a puzzle, which I must solve, and which keeps me intrigued in the art making process. Additionally, I like to create a sense of depth and movement within my work as well. I achieve that by layering transparent materials and attaching separate 2D shapes that vary in thickness. Each work deals with the materiality of the medium and colors, shapes, and patterns selected.

#### **A.J. Memisyazici Artitst's Statement**

The intention of my work is to portray my family and honor them and their memory by sharing who they were with their vices and virtues. Half-Persian from my mother's side, I grew up with the stories of the former lives of my family before the revolution of 1979. My grandmother was one of the last few surviving members of the former Qajar Dynasty, which ruled Persia for over 300 years. I also wanted to pay homage to my other half, as I am also Turkish from my father's side.

My grandfather was the Grand General of the Army, and Chief of Staff to the late Shah Pahlavi. While I can't claim to relate to the pain and the grief my grandparents lived through, I do remember my grandmother's sorrow at seeing her Dynasty cast down, her ancestral home of Golestan Palace being turned into a museum. Her old world wiped from history.

Through portraiture, I work with the subject matter of my ancestry to bring the cultural perceptions and realities that shaped the course of events for my family in history. I strive to express their complex story as well as the reality of their predicaments and conclusions in the timeline of history. Like a biographer might wield their pen, I have wielded my graphite pencils and shone light onto the individuals, which shaped my own life as well as the lives of an entire nation.

In my work, I pay homage to the individuals they were in life, and show them in their humanity. My grandfather in his military uniform, and my grandmother standing in front of her ancestral home which was taken from her. My aunt, whose life was extinguished far too soon for political reasons. My great great-grandfather, the fifth Shah of Persia, with the darker sides of his personality reflected behind him. A portrait of divinity to reflect the importance of spirituality in my family, which played a major role in their survival. As well as, an image of the Father of the Turks, Ataturk in my collected works to highlight my Turkish heritage.

My body of work represents the cultural perceptions of my ancestry, as well as how the public perceived them. The challenge was to memorialize them and to tell their stories and identities through portraiture without words through figurative composition. I achieved this end through using graphite as my main medium, to emulate the black and white photos I used for reference. Through portraiture, they gaze at the viewer out of their frames, as you gaze back at them.

### Spring BFA Show

#### **Holly Nunez Artist's Statement**

My work focuses on the emphasized emotions in equine forms. Working with stone wear, these sculptures are centered around a tactile response to a specific feeling, rather than a naturalistic representation of a horse. I chose clay as a medium because I like the immediacy it offers. Growing up on a horse farm, I was exposed to them at a young age. With over twenty years of riding experience, it almost comes as second nature to feel what the horse is thinking. Fear, tension, excitement and other emotions can be felt by the rider on top of the horse, all while as a pair they appear confident to the viewer. Through the use of color and texture I try to visually communicate the nuances of this intimate relationship between the horse and rider.

Few individuals are able to experience this personal relationship, to completely trust a half ton animal. It is easy to explain how I or another person feels, a horse cannot express their emotions like a person. My goal is to act as a voice for the horse, to visually expose the complex emotions of the horse.

My current work is a series of life size, horse legs, with distorted proportions and colorful palettes, while avoiding the naturalistic representations of a horse, these sculptures are an experimental study of the impact the rider has on the horse. Each sculpture can stand alone and explores tension between the horse and rider in specific dressage movements. Through a balance of texture, color and cracks within each form, I hope to convey the inner struggles between the pair that is hidden from onlookers.

Unfortunately, due to the ongoing pandemic, I am unable to showcase these works as intended. Some of the works displayed are current and past works in different areas of my studies. I hope to rephotograph my work and display it in the future.

#### **Becky Rais Artist's Statement**

The structure of the papaya fruit stimulates me visually with its dark rounded seeds that are contained within the bright fleshy vessel. This vessel represents my life span and the seeds are the events that have shaped my temperament. The form of the papaya represents and contains metaphoric memories from my childhood upbringing that I transform into visual equivalents of shape, texture and color.

I find a relationship with the complexity of my childhood upbringing with the way the seeds are structured within the papaya. I paint from my experiences that include both negative and positive memories. I treat each seed to represent a certain event that I have experienced while interacting with members of my family. Collage is a process that allows me to deconstruct and construct flexible materials in a fluid way, and to arrange select prints and patterns to embody certain memories. Paint is how I erase or heighten the intensity and tenor of the images. Through the processes of collage and painting, I find renewal, stability and strength to be a vital member of society.

**Waldron College of Health and Human Services Research****The Effects of Service-Learning in an Undergraduate CSD Program: Forging Academic Connections and Student Retention**

Student Presenter(s): Kayley King

Faculty Mentor(s): Diane Millar

Service-learning can be defined as an instructional approach used to integrate course material with meaningful community service in hopes of fostering enriched learning experiences and self-reflection (Dragin, 2012). Service-learning is a natural fit for graduate programs, and the inclusion at the undergraduate level has been explored more recently (e.g., Peters, 2011). Historically, this method has been applied within various educational subjects with merited results for both the volunteer and recipient of provided services (Eyler & Giles, 1999; Choi, Raymond, & Hentschel, 2018). This presentation describes a model of service-learning embedded within an introductory CSD course, implemented in two phases. In Phase I, students enrolled in an introductory course within the Communication Sciences and Disorders Department in Fall 2019 were given an opportunity to plan/implement various activities for residents at a local skilled nursing facility. Phase II in Spring 2020, an expansion of the first phase, provided a second class of students in the introductory class with service-learning with pediatric populations. The results of these service-learning projects will be presented, including measures of “D, F, and Withdrawal” rates, student outcomes related to the communication characteristics of the populations, and perceptions of service-learning.

**Waldron College of Health and Human Services Research****Occupational Therapy Students Experiences at Remote Area Medical Clinic**Student Presenter(s): Zoe Millard                      Mariah Malachi                      Karly Morris  
Makenzi Gallagher

Faculty Mentor(s): Judith Malek-Ismail

This presentation will provide insight from students about their trip to Grundy, Virginia, where they took part in a volunteer opportunity at the Remote Area Medical (RAM) clinic to deliver quality therapeutic care to those in need. RAM is a major nonprofit provider for underserved and uninsured communities in need, offering services such as licensed dental, vision, and other medical services free of charge. Many individuals within communities like Grundy rely on the free medical services each year provided by the volunteers of the RAM clinic. Initially, the presentation will introduce what the RAM clinic is and how the experience started. Next, the goals of the trip will be reviewed and followed by an assessment section under student experiences. Lastly, the presentation will cover the overall lessons learned through experience and engagement within the rural community. The purpose of this digital poster is to look into occupational therapists’ value in rural communities, reflect upon the RAM clinic experience, and look towards future ways that occupational therapy students can collaborate to help in community settings. This digital poster opens up the opportunity for Radford University to encourage students to aspire to serve surrounding communities at events such as RAM in an effort to fulfill the university’s vision to serve.

**Waldron College of Health and Human Services Research**



**Waldron College of Health and Human Services Research****Are You Feeling the Burn?: Exploring Perceived Risk of Burnout in OT Settings**

Student Presenter(s): Amanda Jackson      Shantel Jones      Dana Sung  
 Kinsey Johnson

Faculty Mentor(s): Viki Neurauter      Sheila Krajnik      Paula Prince

Purpose: The purpose of this study was to explore perceived level of burnout in the context of practice setting.

Problem: There is no research to date investigating the perceived level of burnout across occupational therapy practice setting.

Method: This study was a quantitative, non-experimental, exploratory pilot study that assessed perceived burnout through the Maslach Burnout Inventory-Human Services Survey. The survey was distributed by utilizing snowball sampling method through word of mouth.

Results: Results pending.

Conclusion: Conclusion pending based on results.

**Waldron College of Health and Human Services Research****Enhancing Safety In Ergonomics- A Proposed Model**

Student Presenter(s): Briyana Jackson Jackson      Jordan Hairston      Tomiko Cary  
 Bernard Gamiao

Faculty Mentor(s): Viki Neurauter      Glen Kent      Sarah Garrison

Occupational therapy can play a vital role in ergonomics and prevention wellness by providing education to caregivers of adult clients. The purpose of this paper was to examine how a one time, one-hour, electronic slideshow and interactive activity will influence caregiver knowledge and perceived performance when it comes to provision of care with clients in adult day centers. Occupational therapy student researchers anticipated conducting an on-site assessment of an adult day center in southwestern Virginia. Due to the Covid-19 pandemic, researchers were not able to complete the originally designed method of intervention. As this project is required to complete the Master of Occupational Therapy program, researchers proceeded with analysis of mock data from a convenient sample that did not fit the original population. Therefore, this research is presented as a proposed model of research and analysis.

Waldron College of Health and Human Services Research**Occupational Therapist Practitioners' Perception Towards the Use of Animal-Assisted Therapy During Treatment and the Impact on Performance Skills**

Student Presenter(s): Kara Mueser                      Samantha Krackow                      Kattie Cox  
    Ryan Woods

Faculty Mentor(s):      Viki Neurauter                      Paula Prince                      Michael Krackow

**Purpose:** The purpose of this study was to gather information from occupational therapy (OT) practitioners as to how they use animal assisted therapy (AAT) to continue clients' current level of function or improve function.

**Methods:** This was an exploratory, qualitative study that was conducted in interview format. The target population for this study was licensed OT practitioners who use or have used AAT within the USA. The instrument for this study consisted of 8 semi-structured questions followed by 3 demographic questions. Interviews were conducted with at least 2 members of the research team present and over preferred video chat method. Analysis of data took place upon completion of all interviews. Interview transcriptions were evaluated by the researchers using a triangulation method and thematic analysis.

**Results:** The results of this study included four participants who were incorporating various animals into OT treatment sessions. However, all four participants implemented different approaches to animal-based interventions to continue or improve their clients' occupational performance specific to their deficits. There were some overlapping methods as to how the practitioners involved their animals, but the use of AAT promotes unique and individualized OT practice overall.

**Conclusions:** AAT has been found to be an effective method for OT treatment, but it remains a minimally researched topic in the literature. This study was limited to four participants. Further research should involve more participants, as well as include OT practitioners who do not use animal-assisted therapy to explore barriers for its use. This research should also investigate how OT practitioners who use AAT view their relationships between themselves and the animal(s).

**Waldron College of Health and Human Services Research****A Service Learning Project in an Entry Level Doctor of Physical Therapy Program**

Student Presenter(s): Sydney Green                      John Flanagan                      Sarah Lawryszak  
                                  Jacquelyn Robbins                      Sean Dolan                      Kaylor Nash  
                                  Quentin Pitts                      Leonardo Quiroga                      Eli Holstege

Faculty Mentor(s):      Wil Kolb

Purpose: The purpose of this project was to review students' perception of collaboration between groups during service learning projects in an entry level DPT program.

Description: Students used service learning and project based learning as methods to apply communication skills and knowledge to serve the needs of the organization Hope to Walk. These skills were built through the development of marketing materials and assisting with research of prosthetic comparison for this non-profit company. Students also engaged in tasks that enhanced management and business administration skills while encouraging a service environment.

Summary of Use: Students learned to collaborate on a team with multiple facets. Collaboration garnered a greater understanding of the process needed for project management while developing effective communication skills across different levels of organization. Results of collaboration were tracked each week with a survey that recorded the following: total hours spent on project, the percentage of project completion, and whether the groups were storming, forming, norming, or performing. Successful development of these skills was reflected in the completion of the project collaboration with Hope to Walk.

Conclusion: Results gathered from weekly surveys helped guide our conclusion to whether service learning projects are beneficial for learning leadership and collaboration. Members of this service learning project gained communication and collaboration tools as well as skills related to marketing, quality control, and data collection. Improving these skills is postulated to increase student leadership roles and community involvement.

**Waldron College of Health and Human Services Research****Bound by Bars? Perceptions of Occupational Therapists Regarding the Need for OT Services in U.S. Correctional Settings**

Student Presenter(s): Olivia Johnson Kelly Linahan Amber Scites  
Shanna Emanuelson

Faculty Mentor(s): Viki Neurauter Sarah Smidl Paula Prince

Purpose. The purpose of this investigation is to identify the perceptions of occupational therapy practitioners in regard to the need for occupational therapy services within the United States correctional facilities.

Method. This is an exploratory research study using free response and closed ended questions in a quantitative survey to assess perceptions of occupational therapy practitioners regarding the need for OT services in U.S. correctional facilities.

Findings. (results are still being analyzed, but will be completed prior to the presentation date)

**Waldron College of Health and Human Services Research****Examining Weight Loss Support Messaging Among African-American Women: A Content Analysis of Social Media Interactions**

Student Presenter(s): Akuyoma Acholonu

Faculty Mentor(s): Sallie Beth Johnson F. Jeanine Everhart, PhD, MPH, CHES

African-American (AA) women have the highest prevalence of obesity in the United States and develop more obesity-related health complications resulting in shortened life expectancy. Related to this disparity, AA women are increasingly engaging in online communities across a range of social media platforms for weight loss support. However, the content and sentiment of their messages in social media interactions is unknown. The purpose of this study is to conduct a qualitative content analysis to examine AA women's social media interactions for weight loss support. Four online communities with the greatest number of monthly publicly available posts in 2019 and a mission-focused exclusively on AA women's weight loss will be selected as a source of message data. One hundred sample text-based message posts with comments will be retrospectively extracted from each community's Facebook, Instagram, and Twitter platforms as units of analysis (n=400). Using Dedoose, two researchers will independently code and weight the de-identified meaning units using a deductive approach (Pearson's correlation  $>.80$ ;  $p<.001$ ). The Social Comparison Theory and its four constructs (e.g., self-evaluation, self-assessment, upward comparison, and downward comparison), along with components of the AHA/ACC/OTS Evidence-Based Lifestyle Obesity Management Clinical Guidelines (e.g., dietary activity, physical activity, and behavior therapy) will be used as frameworks for coding themes and categories. Each meaning unit will be scored on a sentiment weight scale of 1-5; ranging from very negative to very positive. Findings will inform recommendations for future social media platform interventions with AA women's online communities.

Waldron College of Health and Human Services Research**Delivering Low Cost Prostheses to a World in Need: Prostheses Cost Comparison for Hope to Walk Service Learning Project**

Student Presenter(s):	Emily DiSalvo Ellen Turner	Olivia Smith Ankita Roy	Clint Brooks
Faculty Mentor(s):	William Kolb	Daniel Miner	

**Purpose:** There are roughly 30 million people worldwide, mostly in developing countries, who are living with amputations but without prosthetic limbs (1). Hope to Walk seeks to remedy this problem by providing prosthetic legs that cost as little as \$100, which is compared to traditional prostheses that cost \$10,000-\$25,000 (2). Radford University is embarking on a project to compare the functionality of low cost prostheses versus traditional prostheses. The purpose of this project was to compare the cost of Low-Cost Prostheses (LCP) versus traditional prostheses

**Description:** We will compare the cost of Low-Cost Prostheses (LCP) versus traditional prostheses. A cost comparison database will be assembled using information from the Hope to Walk and Virginia Prosthetic and Orthotics organizations. Components of the LCP including the hardware, ongoing alterations, volunteer training and travel expenses, will be compared to the traditional prosthetic hardware and rehabilitation costs.

**Methods:** Our group will accomplish this comparison by meeting with stake-holders and contacting Hope to Walk and Virginia Prosthetic and Orthotics representatives. We will obtain the most current information in order to construct a brochure that will be used to educate future patients on the cost comparison analysis.

**Summary:** We aim to provide a concise and accurate information source to the public by comparing the cost efficiency of LCP to traditionally manufactured prostheses.

**Importance to Members:** The information gained from this service learning project will be of service to amputees in developing countries by helping inform the healthcare and public communities in developed countries about the potential for low cost alternatives to costly traditional prosthetics and the importance of investing in Hope to Walk.

**Waldron College of Health and Human Services Research****Providing Educational Materials to Amputees in Honduras**

Student Presenter(s):	Kimberly Bassler	Emily Hutchinson	Brooke Martin
	Alyssa Fasino	Molly Polizotto	Rachel Stratton
	Morgan McPherson	Montana Hearl	Jennifer Hunter
	Veronica Demarest		

Faculty Mentor(s): Wil Kolb

**Background:** On average, commercial prosthetic legs can cost \$10-25,000 while the average income in Honduras is \$2,000 a year. Hope to Walk's (HTW) mission is to offer prosthetic legs that cost \$100, and to provide training that will help increase access and independence, therefore decreasing the depression and isolation associated with limb loss.

**Purpose:** The purpose was to create educational tools for individuals with limb amputations in countries such as Honduras that could be used by non-profit organizations.

**Methods:** A population assessment was performed to determine patient education level, access to medicine, societal and work influences, and economic factors, in order to create educational resources tailored to this population. Resources used included the Central Intelligence Agency, the International Diabetes Federation, and the World Bank.

**Results:** Results indicated that individuals living in Honduras have limited access to healthcare with a physician ratio of 0.3/1000 person and health insurance rate of 15%. Additionally, social factors indicated Hondurans received an average 10 years of education, and that they value family and enjoy soccer.

**Conclusions:** Handouts were created with more pictures and fewer words along with an educational video focusing on residual limb care and rehabilitation. Additional research is needed to determine the effects of these resources on the amount of physician visits, and impact on functional and recreational activities in order to provide social interaction opportunities.

**Waldron College of Health and Human Services Research****Providing Educational Materials to Amputees in Honduras**

Student Presenter(s):	Kimberly Bassler	Emily Hutchinson	Brooke Martin
	Molly Polizotto	Montana Hearl	Alyssa Fasino
	Jennifer Hunter	Rachel Stratton	Morgan McPherson
	Scott Murray		

Faculty Mentor(s): Wil Kolb

**Background:** On average, commercial prosthetic legs can cost \$10-25,000 while the average income in Honduras is \$2,000 a year. Hope to Walk's (HTW) mission is to offer prosthetic legs that cost \$100, and to provide training that will help increase access and independence, therefore decreasing the depression and isolation associated with limb loss.

**Purpose:** The purpose was to create educational tools for individuals with limb amputations in countries such as Honduras that could be used by non-profit organizations.

**Methods:** A population assessment was performed to determine patient education level, access to medicine, societal and work influences, and economic factors, in order to create educational resources tailored to this population. Resources used included the Central Intelligence Agency, the International Diabetes Federation, and the World Bank.

**Results:** Results indicated that individuals living in Honduras have limited access to healthcare with a physician ratio of 0.3/1000 person and health insurance rate of 15%. Additionally, social factors indicated Hondurans received an average 10 years of education, and that they value family and enjoy soccer.

**Conclusions:** Handouts were created with more pictures and fewer words along with an educational video focusing on residual limb care and rehabilitation. Additional research is needed to determine the effects of these resources on the amount of physician visits, and impact on functional and recreational activities in order to provide social interaction opportunities.

Waldron College of Health and Human Services Research**Efficacy of Repeated Intravenous Ketamine Infusion for Treatment-Resistant Depression; a Systematic Review**

Student Presenter(s): Liv Morka

Faculty Mentor(s): Matthew DeCarlo

While some in some patients' depressive symptoms may reduce within three to six weeks after starting conventional antidepressants, one-third of patients are considered to be treatment resistant failing to receive benefits from these medications (1). For this patient population, options are often limited, slow-acting, and unsuccessful. In the past two decades the N-methyl-D-aspartate receptor antagonist, Ketamine, has been explored for its rapid antidepressant properties. With evidence supporting the benefits of Ketamine as a single use rapid antidepressant, in particular for patient populations with acute suicidality. Since this discovery the concept of using Ketamine as a repeated treatment for depressive disorders as become increasingly more popular. The pathophysiology of depressive disorders is often linked with a monoamine deficiency and increased glutamate levels, which suggests that N-methyl-D-aspartate receptors (NMDAR) could also be an effecting factor due to its integral roles as a glutamate receptor (2,3). As Ketamine is a NMDAR antagonist and its effect with glutamate this could explain its rapid anti-depressant effect. Due to this pathophysiology response ketamine has been successful in the treatment of depressive disorders in emergency settings and increasingly as a treatment option (1,4). This systematic review studied 26 publications to analyze the efficacy of repeated intravenous ketamine on depressive symptomatology in adults with Treatment Resistant Depression.

Waldron College of Health and Human Services Research**Virtual Reality as an Exposure Therapy for PTSD**

Student Presenter(s): Noelle Abbott

Faculty Mentor(s): Jerusalem Walker

Military personnel in a war situation are more susceptible to traumatic events and are more at risk of developing posttraumatic stress disorder (PTSD). PTSD has been widely researched throughout the decades. Multiple different types of therapies and combinations have been used to help veterans deal with the symptoms they experience from having the psychiatric condition. Veterans are more likely than the general population to suffer from this condition and it has long-term effects. Virtual reality therapy has been researched since the mid-1990s to help veterans through exposure therapy in a controlled scenario. Virtual reality has shown promise in the treatment of veterans with PTSD who have been nonresponsive to other treatments. Nurses may be one of the first individuals that a veteran sees when coming back from overseas or during a routine examination. Therefore, it is important for nurses to be aware of the symptoms and treatment of PTSD because veterans are seen in every medical setting. Nurses can be great advocates for their veteran patients in achieving individualized care. This poster presentation will highlight PTSD and its symptoms. Also, this poster presentation will highlight how PTSD has changed throughout the wars and current research as well as treatment. Lastly, the presentation will include how virtual reality can be involved as an alternative treatment modality and the use of Bravemind technology by Dr. Skip Rizzo.