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Schedule of Events
Thursday, April 10, 2025

Welcome
9:15 a.m. * *McAlister Hospitality Suite*

Poster Presentations
9:30 a.m. – Noon * *Floor of TD Arena*

Oral Presentations
9:30 a.m. – 10:50 a.m. * *McAlister Hospitality Suite*

9:30 a.m. **Healthy Returns: Why it is Important for Educators to be Trained on Reintegrating Students After Hospitalization**
Ally McKeown, Department of Teacher Education, School of Education
Faculty mentor: Dr. Laura Brock

9:40 a.m. **4,500 Seconds: Small Data Training Approaches for Deep UAV Audio Classification**
Andrew Berg, Department of Computer Science, School of Engineering, Computing, and Mathematics
Faculty mentor: Dr. Mia Wang

9:50 a.m. **The South German Rococo as Gesamtkunstwerk: The Gilded Escapism of Art and Music in the Wittelsbach Court**
Ella Bougher, Department of Art History, School of the Arts
Faculty mentor: Dr. Rebekah Compton

10:00 a.m. **Microplastic Munchies: Exploring microplastic trophic transfer potential between two key prey fish species and resident bottlenose dolphins (Tursiops truncatus) in Sarasota**
Stella Martin, Department of Health and Human Performance, School of Health Sciences
Faculty mentor: Dr. Leslie Hart

10:10 a.m. **Development of Two CubeSat Payloads for Upcoming Launch to the International Space Station**
Gael Gonzalez, Department of Physics and Astronomy, School of Natural and Environmental Sciences
Faculty mentor: Dr. Joe Carson

10:20 a.m. **A Family Remembered: Installing New Memorials in Berlin for the Lost Family Members of South Carolina Jews**
Leah Davenport, Jewish Studies Program, School of Languages, Cultures, and World Affairs
Faculty mentor: Dr. Chad Gibbs

10.30 a.m. **Unsettled: How Education on Title IX Shapes Female Athletes' Views of the NCAA Settlement**
Lexi Drumm, Department of Accounting and Business Law, School of Business
Faculty mentor: Dr. Roxane DeLaurell

10:40 a.m. **Surviving versus Embalming: What different encoding tasks tell us about the nature of human memory**
Lia Hansen, Department of Psychology, School of Humanities and Social Sciences
Faculty mentor: Dr. Cindi May

School of the Arts Showcase

11:00 a.m. – *McAlister Hospitality Suite*

Individual performances will run for approximately 5-10 minutes.

Theatrical Performance
The Tragedy of Macbeth: by William Shakespeare
Directed by Aiden Wunderley; Performed by Gray Irene Crews, Morgan Kelly, Jay Davis, and Grace Ratledge
Music by Mitski
Faculty advisor: Todd McNerney

Dance Performance
"Her Voice, Her Power"
Choreographed by Skylar Carroll; Performed by Sophie Ketchum
Music by Son Lux and Olafur Arnalds; Text by Breigh Carroll, Jordan Carroll, Maile Carroll, and Skylar Carroll; Edited by Skylar Carroll
Faculty advisors: Kristin Alexander and Dr. Gretchen McLaine

Musical Theatre Performance
"Pandemonium" from *The 25th Annual Putnam County Spelling Bee*
Performed by Taylor Bussey, Jenna Bush, Drake Carney, AK Dennis, Lauren Evans, Emma Feeney, Benji Gray-Miller, Peyton Grant, Gabel Hirlston, Olivia Maness, Dailyn Mincey, Paeton Patterson, Grace Ratledge. Sam Rhodes, Ellie Schrupp, Noah Whisonant
Music and lyrics by William Finn
Director and faculty advisor: Dr. Peter Spearman

Music Performance: Chamber Music
Antonin Dvořák: *String Quartet in Eb Major, Op. 97*, Mvt. I Allegro ma non tanto
Julia Rhyne and Danny Maniscalco, violins
Autumn Buchta and Payton Lee, violas
Isaac Hill, cello
Faculty Advisors: Lee-Chin Siow, Natalia Khoma, Dr. Tom Hicks, Volodymyr Vynnytsky

Keynote Presentation

12:15 p.m. – *McAlister Hospitality Suite*

Drug Discovery in Action: Using Logic and Problem-Solving in Organic Synthesis
Tim Barker, Ph.D.
School of Natural and Environmental Science

Tim Barker is an associate professor of chemistry and biochemistry, and recipient of the College's 2024 William V. Moore Distinguished Teacher-Scholar Award. Dr. Barker and his research students have been preparing organic compounds targeted to bind to the human serotonin transporter in hopes of developing an inhibitor as a new treatment for depression and related medical conditions. Computational studies are performed to help the lab target compounds that would bind in the active site. He will start out interpreting organic hieroglyphics that are used to describe organic molecules and then discuss how he and his research students go about preparing new compounds with possible medicinal applications in his presentation titled "Drug Discovery in Action: Using Logic and Problem-Solving in Organic Synthesis." Find out more about Dr. Barker.

Awards Ceremony

1:00 p.m. – *McAlister Hospitality Suite*

Oral Presentation Abstracts

The South German Rococo as Gesamtkunstwerk: The Gilded Escapism of Art and Music in the Wittelsbach Court
Ella Bougher, Department of Art and Architectural History, School of Arts
Faculty Mentor: Rebekah Compton

This project focuses on how the opulent Rococo art, music, and culture of the Bavarian court during the period c. 1740-1770 combined to embody the concept of Gesamtkunstwerk, or "total work of art." Ascending to the throne in the midst of war and political strife, the young prince-elector Maximilian III Joseph departed sharply from his predecessors' penchant for bloodshed, instead dedicating his rule to the pursuit of the arts. Schloss Nymphenburg, the Elector's favored residence, houses the ultimate manifestation of his artistic tastes: the lavish Steinerner Saal. Covered in flowering stucco, gilding, and crowned with J.B. Zimmermann's extravagant fresco, the heart of the summer palace visually overwhelms its viewers with detail. Zimmermann's work depicts the nymph Flora's transition to goddesshood, surrounded by Olympian iconography that heralds the Bavarian Electorate's newfound peace and prosperity. In addition to the fine arts, Max Joseph placed equal emphasis on music, surrounding his court with melody throughout the long summer days at Nymphenburg. Hofkapellmeister Andrea Bernasconi exerted Venetian influence on the court's music, and fittingly so: 18th-century Italian styles emphasized spontaneous yet skillful ornamentation of scores, as opposed to the restrained French style. The works played for the Elector and his aristocratic audience thus would have been floral and embellished, providing the aural counterpart for the visuals of the Steinerner Saal. This project explores how the elements of art and music combined to create an immersive somaesthetic experience that transported its 18th-century audience to an Elysian escape, free of strife and rich in beauty.

Unsettled: How Education on Title IX Shapes Female Athletes' Views of the NCAA Settlement ♻
Lexi Drumm, Department of Accounting and Business Law, School of Business
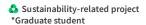**Faculty Mentor: Roxane DeLaurell**

The NCAA is currently negotiating a $2.8 billion class-action settlement addressing past restrictions that prevented college athletes from profiting from their name, image, and likeness (NIL) or receiving additional compensation beyond scholarships. However, approximately 90% of the settlement funds are expected to be allocated to male athletes, raising concerns about potential Title IX implications. A key debate in this case is whether the distribution of damages must comply with Title IX regulations. This research examines the understanding of Title IX and awareness of the settlement among current Division I female student-athletes in South Carolina (athletes being surveyed from CofC, Clemson, USC, Wofford College, The Citadel, Winthrop University, Presbyterian College, Charleston Southern, Furman, USC-Upstate, Coastal Carolina University). Through survey analysis, the study evaluates female athletes' perspectives on the fairness of the proposed settlement and whether they believe Title IX should influence the distribution of funds. Additionally, this research aims to assess the depth of female athletes' knowledge of Title IX, identify gaps in understanding, and provide insights into how educational efforts can be improved to ensure athletes are well-informed about their rights and protections.

Healthy Returns: Why it is Important for Educators to be Trained on Reintegrating Students After Hospitalization ♻
Ally McKeown, Department of Teacher Education, School of Education
Faculty Mentor: Laura Brock

♻ Sustainability-related project
*Graduate student

Training educators to properly reintegrate students to a school setting after experiencing hospitalization is important to the recovery of children and should receive school allocated funds. Research shows that three main factors display the need for proper school-funded training including teachers' need to recognize signs of post-hospitalization mental effects, the importance of constant communication between stakeholders, and the resources to ensure the classroom is cohesive to the students' recovery. School funded training in these areas for faculty potentially changes the adverse effects of hospitalization on children's development and opens the door for new methods of learning for teachers. Research by top pediatric organizations such as University of Michigan School of Medicine Trauma and Burn Center, The American Academy of Pediatrics, Journal of Head Trauma Rehabilitation, The United States Department of Education, and The Journal of Pediatrics have all displayed similar findings on the recovery and education of hospitalized children with varying ages and prognosis. Findings showed that recovery depends heavily on age, patients lose their sense of independence and connection to peers, and face adverse mental health effects after hospitalization. It also found that the most productive reintroduction process occurs when all parties communicate and plan ahead of the child's arrival back to school, all legal rights of the child are known and practiced, and school communities are educated and encouraged to support the child in an age appropriate manner. Sharing this information with educators could potentially increase school funded programs and shape how hospitalized students view their return.

4,500 Seconds: Small Data Training Approaches for Deep UAV Audio Classification
Andrew Berg, Department of Computer Science, School of Engineering, Computing, and Mathematics
Faculty Mentor: Mia Wang
Additional Author: Qian Zhang

The usage of unmanned aerial vehicles (UAV) in all sectors has grown exponentially, with this, an urgent need for robust classification of UAVs to protect against global incidents. Using an extremely small 9-class dataset, this paper implements and tests a parameter efficient fine-tuning process for pre-trained audio transformers.We compare our results with previous work using convolutional neural networks (CNNs). Our results show that, while encouraging initial runs, CNNs still outperform transformers by 1-2%, while still being more efficient. These early findings show that there is more to explore with transformers to yield better results. Future works aim to upscale the data set to better understand the trade-offs between these approaches.

Microplastic Munchies: Exploring microplastic trophic transfer potential between two key prey fish species and resident bottlenose dolphins (Tursiops truncatus) in Sarasota Bay, Florida ♻

Stella Martin, Department of Health and Human Performance, School of Health Sciences
Faculty Mentor: Leslie Hart
Additional Authors: Miranda Dziobak (1,2), Randall S. Wells (3), Elizabeth J. Berens McCabe (3), Savannah M. Case (1), Eric Conger (4), Tita Curtin (1), Mackenzie Eccles (1), Ayushi Gaur (4), Millie A. Knowles (1), Robyn Faulkner Allen (3), Christina Toms (3, 5), John E. Weinstein (6)
> 1) Department of Health and Human Performance, School of Health Sciences, College of Charleston
> 2) Department of Environmental Health Sciences, Arnold School of Public Health, University of South Carolina
> 3) Brookfield Zoo Chicago's Sarasota Dolphin Research Program
> 4) Department of Biology, School of Natural and Environmental Sciences, College of Charleston

5) Department of Psychology, New College of Florida

6) Department of Biology, The Citadel, Department of Health and Human Performance, School of Health Sciences

Microplastics have been identified in over 100 marine species, with evidence of trophic transfer to predators consuming contaminated prey. Sarasota Bay bottlenose dolphins (Tursiops truncatus) serve as sentinels of coastal pollution, including plastics and chemical plasticizers. Previous research confirmed microplastic ingestion in these dolphins (100.0%, n=7) and extensive contamination in 11 common prey species (96.5%, n=86). This study compared microplastic abundance and characteristics in dolphins and their two most common prey species, Gulf toadfish (Opsanus beta, n=30) and pinfish (Lagodon rhomboides, n=35), to assess potential trophic transfer. Dolphin ingestion was evaluated using gastric (n=23) and fecal (n=15) samples from catch-and-release health assessments (2022-2024), while prey gastrointestinal and muscle tissues were screened. Particles were prevalent across samples (dolphins: 82.6%, pinfish: 97.1%, toadfish: 96.7%), with fibers as the dominant shape. Black, yellowed, grey, green, and pink fibers were found in all sample types. Pinfish had a higher mean particle load (3.05 particles/g tissue) than toadfish (1.05 particles/g tissue; p=0.006). Based on estimated daily food intake (9.07 kg) and diet composition (toadfish ‚Äì 34.8%, pinfish ‚Äì 9.4%), Sarasota dolphins may ingest nearly 6,000 particles/day. Contaminated prey fish may be vectors for dolphin microplastic exposure and potentially humans, as some are directly consumed as seafood or used as baitfish in commercial fisheries. This study emphasizes the need for further research on microplastic pathways in marine food webs and implications for wildlife and human health.

Surviving versus Embalming: What different encoding tasks tell us about the nature of human memory
Lia Hansen, Department of Psychology, School of Humanities and Social Sciences
Faculty Mentor: Cindi May
Additional Author: Janet Nash

Memory underlies most of human life, from understanding who we are to knowing our preferences, passions, and histories. Some researchers have argued that memory serves an evolutionary function, helping us survive and reproduce. Evidence for this evolutionary account of memory comes from a finding known as the "survival processing effect" (SPE; Nairne, Thompson, & Pandeirada, 2007). In a typical SPE experiment, participants view a list of words. For some items, participants rate how relevant each word might be to their survival in the wilderness. For other items, participants rate their pleasantness. Memory is better when participants think about survival rather than pleasantness. We explored whether the heightened memory in the survival processing condition comes from a focus on survival, per se, or from other proximate mechanisms induced in that condition. For example, the survival condition evokes strong negative emotion (i.e., fear) and very rich encoding because it requires participants to consider multiple uses for each list item. To explore the idea that proximate mechanisms drive the SPE, we created a new encoding condition (the embalmer condition) in which participants imagined they were an embalmer who had to execute three disgusting jobs with limited resources (the list items). We thus evoked strong negative emotion (here, disgust) and required participants to consider multiple uses for each item, but did not mention survival. Our participants engaged in three encoding conditions: Survival, Pleasantness, or Embalming. Our findings support the theory that emotion and richness of encoding rather than survival drive the SPE.

A Family Remembered: Installing New Memorials in Berlin for the Lost Family Members of South Carolina Jews
Leah Davenport, Jewish Studies Program, School of Languages, Cultures, and World Affairs
Faculty Mentor: Chad Gibbs

♻ Sustainability-related project
*Graduate student

As World War II approached, Malie Landsmann wrote to her cousin Minnie Tewel Baum, of Camden, SC, hoping that Minnie would help Malie and her family escape Nazi Germany. Over the next 3.5 years, Malie and Minnie exchanged a couple dozen letters, with Minnie going to extreme lengths to get her previously unknown cousin and family out of Berlin. Unfortunately, a nurse and homemaker in smalltown Camden could only do so much. In the end, German police deported the Landsmanns to a ghetto in Poland. From there, Nazi authorities sent the family to Auschwitz where they were murdered in 1942. As I researched the Landsmann family and their South Carolina relatives, I learned of the Stolpersteine, or Stumbling Stones memorial project. The creator, Gunter Demnig, started the project as a way to memorialize victims of the Holocaust by placing engraved brass stones in front of the person's last free residence. There are now over 100,000 Stolpersteine across Europe. There will soon be four more of these plaques in Berlin to remember Malie, Chaim, Ida, and Peppi. In March 2025, Dr. Chad Gibbs and I will travel to Berlin to attend the memorial installation in front of the Landsmann's former home at 17 Hirtenstrasse along with the Charleston-area descendants of Malie's relatives. From a set of letters held by Addlestone Library Special Collections to new commemorations in Berlin, my paper is about the Landsmann family and work to remember them here and at their one-time home.

Development of Two CubeSat Payloads for Upcoming Launch to the International Space Station
Gael Gonzalez, Department of Physics and Astronomy, School of Natural and Environmental Science
Faculty Mentor: Joe Carson
Additional Authors: Kevin Gainey (Pensievision Inc), Bailey Williamson (Pensievision Inc), Stanley McAfee (Pensievision Inc), Julia Wakefield (Pensievision Inc), Chris Lesoine, Marcos Diaz (Universidad de Chile)

We present development efforts for two CubeSat payloads: (1) an ultraviolet camera for monitoring stellar activity among young M-type stars, and (2) a multi-focus optical camera for monitoring internal biological specimens. Both payload systems are being developed at College of Charleston, and are intended to be contributed as part of a future CubeSat mission led by the Space and Planetary Exploration Laboratory (SPEL) at Universidad de Chile. A precursor mission to the International Space Station, intended to demonstrate space-based performance of these payloads and also led by SPEL, is planned for launch in mid 2025. A followup CubeSat mission is expected to launch in the 2nd quarter of 2026. Investigating stellar activity among M-type stars, the most populous stars in the universe, will help inform models of exoplanet atmosphere evolution, including models relevant for understanding M-dwarf habitable zones. Since such stellar outbursts are most prominent at ultraviolet (UV) wavelengths that are invisible to ground-based observers, a space-based observatory with significant (e.g. multiple-month) observing time is required. The UV imaging system is intended to achieve required sensitivities for monitoring stellar activity among nearby (<15 pc) M-dwarfs. The second payload centers on a novel, multi-focus, liquid lens based optical imaging system, developed by Pensievision Inc and College of Charleston, to monitor internal biological specimens such as extremophile microbes. It marks the first demonstration of a liquid lens imaging system in space. The development of these two payloads has a secondary goal of helping build infrastructure for CubeSat development in South Carolina.

Poster Presentations

9:30 a.m. – noon
TD Arena

SCHOOL OF THE ARTS

Department of Art and Architectural History

1. Academic Art in Bologna: The Paintings and Sculpture of Santa Cristina della Fondazza
Student Presenter: Zina Dawood
Faculty Mentor(s): Rebekah Compton

This project, titled Academic Art in Bologna: The Paintings and Sculpture of Santa Cristina seeks to synthesize the artistic styles of Italian Mannerism and the early Italian Baroque with artistic output in early Modern Bologna. The convent of Santa Cristina della Fondazza takes primary focus, since its external church includes artwork which were made by prominent artists with ties to the developing tradition of the Bolognese art academy. Santa Cristina was founded in the thirteenth century and developed a musical tradition within its nuns. By the seventeenth century, its exterior church was renovated which saw new artistic additions to the church being paid for by the nuns themselves. The high altarpiece, for example, is a work by Ludovico Carracci, and positions behind the only sculptures produced by Guido Reni. Furthermore, artwork at Santa Cristina reflects the anxieties about Christianity developed by Bolognese Archbishops following the Protestant Reformation. The stylistic shift enforced by religious officials regarding standardizing religious artwork takes extreme focus in Bolognese art, especially in spaces such as convents and churches. Through iconographic and contextual analysis, this project will detail the way Counter Reformation Church reform materialized through visual artwork, and restrictions on the visual arts. Furthermore, analysis of the history of Santa Cristina and the nuns who inhabited it will aid in detailing gendered dynamics in Bologna during the early Modern period. This will provide deeper insight into the visual depiction of female figures such as the Virgin Mary and Saint Christine in the convent, as well.

2. Alternative plan for Union Pier and the American College of the Building Arts ♻️
Student Presenter: Anthony Kule
Faculty Mentor(s): Ralph Muldrow

In this project, the current state of Union Pier was evaluated along with the plans for reuse in order to develop an alternative plan for the area. This plan takes into account the unstable foundation of Union Pier, allowing much of it to be returned to nature for better storm surge protection as well as a free space for the public to enjoy. This plan includes a new campus for the American College of the Building Arts, with facilities to support and celebrate the historic building arts being taught. This plan offers a unique perspective on community planning which seeks to flow seamlessly from the Ansonborough neighborhood into public spaces for all to enjoy.

3. Reimagining Union Pier: A Sponge City Approach to a Climate-Resilient Waterfront for Charleston, South Carolina ♻️
Student Presenter: Molly Schweickhardt
Faculty Mentor(s): Ralph Muldrow

Located near the historic neighborhood of Ansonborough in Charleston, Union Pier stands as the next challenge of Lowcountry urban planning. Standing on about 70 acres of artificial fill and terminal piers over water, Union Pier was recently sold to Ben Navarro from the South Carolina State Ports Authority for redevelopment. Through

♻️ Sustainability-related project
*Graduate student

drawing my ideal development of Union Pier's waterfront, I balanced community needs with sustainable development amid increasing climate challenges. Historic maps of Charleston reveal that Union Pier was marshland and gradually filled over time for development. Today, only 51% of the property is above water, leading to the constant risk of flooding due to the increased storm events and its position on artificial fill. While a proposed solution to mitigate erosion and storm surge is a seawall, I aim to emphasize its long-term ineffectiveness due to acceleration of coastal erosion and disruption of natural ecosystems. Instead, a more sustainable approach to flood management, one rooted in ecological resilience, is needed in Charleston. To address the increased risk of flooding, I propose a flood management strategy inspired by the "sponge city" concept, first introduced in China in 2014. The sponge city model integrates green infrastructure, such as wetlands, parks, and urban forests, to absorb, store, and slowly release rainwater, reducing flooding. Since Charleston is in need of larger public parks, this project presents an opportunity to transform the waterfront into a climate-resilient green space. My project aims to satisfy both community and ecological needs through a sustainable flood mitigation system.

4. How Gender Roles were Reflected in Precolonial African Cultures - A Focus on Masquerades
Student Presenter: Stella Stephens
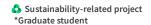**Faculty Mentor(s): Tara Prakash**

Since the beginning of time, art has been a way for historians and archaeologists to understand the lifestyles, interactions, and ideologies of early societies. One concept that varies across cultures and generations is the notion of gender roles, specifically, how society perceives men and women and how these perceptions are represented in art through various symbols and motifs. Within many precolonial African societies, gender roles were clearly exhibited through their ceremonies and rituals and the art forms that accompanied them. A universal example of ceremonial art is decorated masks used in masquerades. My project investigates the ritual roles of men and women and how masks emphasized the differences in gender. I explore how different symbols, colors, materials, and performances conveyed different meanings for female masks in comparison to male masks. It is also crucial to understand why women were depicted in the masquerades yet usually excluded from participating and how this reflects the cultural norms in African societies. My analysis of the gender roles in precolonial African cultures focuses on the conspicuous nature of symbolism in masquerading and the exclusion and mockery of women during celebratory events. When women were celebrated in masquerades, it was most often to celebrate the hardships of childbirth and motherhood. When men were portrayed in masquerades, it epitomized their strength, power, and wealth. This is one of the many examples of how the rituals in African societies alluded to gender roles and the expectations of women.

Department of Arts Management

5. How Project Management Can Help Manage the Arts: Exhibition Planning
Student Presenter: Shelby Allen
Faculty Mentor(s): Hsin-Ching Wu

This project delves into the exhibition planning process, within the arts management field, through the lens of two project management domains,AI risk and stakeholder management. The author investigates what processes exhibition coordinators use and how specific project management techniques and methods optimize execution and outcomes. While existing literature acknowledges the necessity of a dedicated staff member overseeing exhibition coordination and suggests collaboration with project managers, it does not extensively address the application of structured methodologies such as matrices or risk assessment tools. The author contributes their understanding of how a traditionally for-profit business framework, project management, can be used to bolster and inform cultural institutions' processes. The author consulted two expert interviewees from the exhibition and curation fields to provide practical insights. Both individuals stress the importance of considering the exhibition audience, both intended and unintended, and understanding their communication, content, and aesthetic preferences. They also

highlight the subjectivity of exhibition success, which can be measured through metrics such as visitor participation, donor engagement, attendance, revenue generation (if applicable), etc. Each of these is valuable, but organizations must have a standard data collection process to ensure meaningful evaluation and comparison. Then, backed with expert interviews, the author surveyed possible artists and artwork to design an exhibition and complete several key project management processes, demonstrating functionality and feasibility. The project concludes with an analysis of this interdisciplinary approach and identifies potential avenues for future research, emphasizing the value of structured project management in optimizing exhibition planning within cultural institutions.

6. The Evolution of Concert Ticketing: From In-Person Box Offices to Digital Market Monopolization
Student Presenter: Ava Cottone
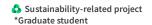**Faculty Mentor(s): Heather McDonald**

The concert ticketing industry has undergone a dramatic transformation over the past four decades, shifting from in-person sales at venue box offices to an online-dominated marketplace controlled by a few major corporations. While technological advancements have expanded accessibility, allowing fans from across the globe to purchase tickets effortlessly, the industry has simultaneously become plagued with monopolization, exorbitant fees, and resale market exploitation. This research examines the evolution of ticketing practices from the 1980s to the present, focusing on how the transition to online sales has contributed to the increasing difficulty of securing fairly priced tickets. Through case studies such as Bruce Springsteen's 1985 "Born in the USA" tour, Pearl Jam's 1994 lawsuit against Ticketmaster, and the highly publicized controversy surrounding Taylor Swift's "Eras Tour," this study traces the major shifts in ticket distribution and their impact on consumers. Additionally, the research explores the role of Ticketmaster and its parent company, Live Nation, in consolidating power within the industry, leading to antitrust lawsuits and regulatory scrutiny. By analyzing Department of Justice investigations, artist opposition, and consumer backlash, this study aims to uncover the root causes of pricing inflation and limited ticket availability. The ultimate objective of this research is to propose solutions that benefit both consumers and industry stakeholders. By balancing fan accessibility with the financial realities of ticket sales, this study seeks to identify sustainable reforms that promote fair pricing and transparent distribution in the modern concert ticketing market.

7. Career Preparation of Young Adults in the Film Industry: Guides and Recommendations
Student Presenter: Dani Faulhaber
Faculty Mentor(s): Hsin-Ching Wu

This project focuses on the career pathway for young adults entering the film and television industries. According to the US Bureau of Labor Statistics, the unemployment rate within the film industry is sometimes triple the average unemployment rate in the United States, discouraging young creators from entering the industry. Although a number of people entering the industry will succeed, some will resort to finding employment in other creative opportunities outside of the film industry. In the worst case, a number will fail to find viable opportunities. This project acts as a guide to help young adults pursue careers in the contemporary film industry. Through reading scholarly journals and interviewing professionals in the industry, the author compiles the overlapping themes in this project to highlight key components critical to answering the question of inquiry. Three major themes stand out. The first is the different points of entry into the industry, showing readers that there is no "right way" to enter the industry. The second emphasizes the importance of networking to find opportunities. The last major theme is resilience, reminding readers that entering the film and television industries requires facing rejection, instability, and relying on self-efficiency. This project is key to understanding how to find employment in the film industry as a young adult in today's job market. The information in this project provides a potential career map to comfort young adults in finding their way in the film and television industries.

8. Fragmented Eden: Reimagining the Human in Nature (Garden) ♻
Student Presenter: Caitlin Ham
Faculty Mentor(s): Claire Long

In a world where the boundaries between human identity and the natural environment are increasingly blurred, Garden explores the interwoven relationship between body, nature, and digital manipulation. This piece deconstructs the traditional separation of the self from the organic world, merging human skin with foliage, animal textures, and abstracted natural forms to create a surreal, immersive landscape. Using digital collage and compositing techniques, this work challenges the notion of fixed identity by dissolving the figure into its surroundings, suggesting both unity with and fragmentation from nature. The tension between artificiality and organic growth raises questions about transformation, decay, and rebirth, AI-echoing mythological and ecological themes. Rather than dictating a singular interpretation, Fragmented Eden (Garden) invites viewers to explore their own relationship with nature and selfhood. Are we intruding upon the natural world, or are we simply another layer within its design? As technology continues to reshape our interactions with the environment, this work offers a visual meditation on the fluidity of existence in an era of ecological and digital hybridity. By presenting Fragmented Eden (Garden) at EXPO 2025, I hope to contribute to a broader discourse on digital art as a tool for philosophical inquiry, challenging the boundaries between human, machine, and nature.

9. Echoes Through Time: Milestones in Music History
Student Presenter: Abigail Lute
Faculty Mentor(s): Heather McDonald
Additional Authors: Caitlin Kelly, Ava Ulian, McKenna Greene

This project, arising from the Arts Management Music Industry Capstone course, presents pivotal moments throughout history that changed music into what we know today. We follow various genres including disco, folk, rock, and blues, with a focus on the 1950s through the 1980s. We also highlight prominent stories from popular artists, music festivals, and albums that pertain to our research. This project will culminate in a collaborative magazine, including long-form and short-form articles, listicles, infographics, images, and pop-out sections.
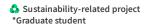
Department of Music

10. "Know Thy City, Know Thyself": Honoring Buist Academy via Story in Charleston, SC ♻
Student Presenter: Amani Affonso
Faculty Mentor(s): Brooke Permenter

As first-year students at the College of Charleston Honors College, we venture past the classroom to explore the stories embedded in historic Charleston. This poster utilizes place-based learning and City as Text™ practices, aligning with our school's motto, "Know Thyself." This project draws on primary historical sources, archival documents, and my personal experience returning to Buist Academy, the school I once attended. Buist Academy, originally Buist Elementary, in Charleston, South Carolina, is a symbol of the impact of racial segregation in U.S. education. Founded in 1921 as an all-Black school, it served African American students during the Jim Crow era, who faced extreme overcrowding, inadequate resources, and systematic inequality. Despite these challenges, Buist played a pivotal role in the civil rights movement, with a 1950 lawsuit by parents contributing to the landmark Brown v. Board of Education decision that declared racial segregation in public schools unconstitutional. However, the school's transformation into a predominantly white academic magnet in the 1980s erased much of its historical significance. A lawsuit in 2002 against racial quotas led to a major decrease in Black student enrollment- by 2016, less than 5% of the student population were Black. Buist's shift from an all-Black institution to a selective school mirrors broader patterns of erasing African American histories, as seen in Clint Smith's How the Word is Passed and the Charleston Syllabus. While Buist's past reflects deep injustices, it also offers a valuable opportunity to reflect on the need for equal representation in education moving forward.

11. From Baroque To Classical: How Standardization In The 1800s Transformed The Modern Violin
Student Presenter: Molly Brockinton

Faculty Mentor(s): Kim Sauberlich

Music scholars have argued that a central historical shift took place in the early 1800s regarding the standardization of a range of Western Art music, especially in the realms of music notation, composition, and practice. However, many of the instruments and techniques used to build and maintain them have received less attention. In this light, my paper examines the standardization of musical instruments by examining key 18th and 19th-century treatises as well as work by historical musicologists. I define standardization as the process of building instruments according to consistent standards pertaining to measurement, composition, tone, and tuning based on developing standards and techniques. I argue that the standardization of the violin at around 1820 marked a central historical transformation in violin technique and material constitution as well as a shift in the skillset needed to play and maintain a musician's instrument.

12. Enrique Granados: A Fusion of Spanish and European Styles through Exoticism and Orientalism
Student Presenter: Lucy Richmond
Faculty Mentor(s): Michael O'Brien

Enrique Granados (1867-1916) stands at the crossroads of Spanish nationalism and European Romanticism, drawing inspiration from Schubert, Chopin, and Debussy, while remaining deeply rooted in his heritage. Following Leo Tolstoy's advice to "paint your village," Granados explores a broad spectrum of influences, yet always reflects the spirit of Spain in his own compositions. This poster, which summarizes the main argument of my lecture-recital (to be presented April 19), explores how Granados redefined European musical traditions, creating a musical world that is infused with exoticism and Orientalism. I trace Granados' influences, including Franz Schubert's lyrical expression and harmonic depth, as illustrated in his Impromptus. Similarly, while Chopin's Nocturne in E minor and Granados' Danza No. 2 "Oriental" share expressive and structural elements, Granados' Danza No. 5 "Andaluza" and Debussy's La Puerta del Vino more clearly illustrate exoticism. Debussy, a French composer, adopts the habanera rhythm, interpreting the cultural heritage of Spain through an outsider's perspective, while Granados embraced European techniques to elevate his authentic, national style. Finally, a comparison of Chopin's Mazurka in B minor and Granados' Escenas Románticas No. 1 "Mazurka" further shows this interest in exoticism and allows us to explore how the Polish dance form evolved through Granados' Spanish lens. Through these musical intersections, this presentation not only showcases Granados' inspirations, but it also highlights how he masterfully painted his own village, by blending European trends with his richly embedded Spanish heritage to create a deeply resonant and distinctive musical voice.

Department of Studio Art

13. Environment Through Black Queer Lens ♻
Student Presenter: Dare Adams
Faculty Mentor(s): Susan Klein

I aim to shed light on the parallels between Black queer resistance and environmental advocacy. Both perspectives have been historically and in the contemporary world marginalized and vilified.

14. The Echo in the Ivy
Student Presenter: Ashley (Ash) Ogden
Faculty Mentor(s): Morgan Kinne

The proposed body of work, The Echo in the Ivy, is an installation and public interaction art piece through an empirical research lens. As an artist, I visually represent my "fantasy science," inspired by ideas in The Secret Life of Plants (1973) by Peter Tompkins. I propose that plants preserve an energy field beyond human perception.

♻ Sustainability-related project
*Graduate student

In my recent art show, Do the Trees Whisper Back (2024), audience members encountered plants while walking with headphones. MP3 players with long aux cords were buried under the soil, allowing participants to symbolically "plug into the frequencies" of the plants. The audio component served as an analogy for the unseen energy field. Expanding on this notion, I now aim to test my theory. I will purchase two identical English ivy plants (known for their responsiveness to human presence). Both will receive identical survival conditions,-light, soil pH, watering, humidity, and temperature, and be placed on opposite ends of a public space (proposed: the first floor of the Albert Simons Center for the Arts). Passersby will be instructed to hate and ignore one plant while loving and admiring the other. Routine documentation of growth will explore nature's ability to perceive human neuroelectricity through intention, attention, and admiration.

15. Picturing Personhood
Student Presenter: Mary Walt
Faculty Mentor(s): Dylan Beckman

This work seeks to compile profound bodies of artwork, constructing analysis and writing creatively about the work. The second part of this effort will be responding to this collection by making a body of work of my own. This project focuses on investigating and analyzing photographic work. The research will be presented in the form of an analytical essay with attached images for the reader's reference. It will display and discuss works that have been integral to the history of photography and to my own creative practice. The project, in response to this research, will be composed in the form of a photo book,-collecting archival imagery in conjunction with authentic and constructed photographs, conveying an intimate memoir. This collection will also be accompanied by writing, revealing ample context to the work, elevating the story and the way it resonates with the viewing audience. The images and text intend to incite reflection, conversation, and even critique relating to themes surrounding the disconnect between place and identity in the rural South. This form of analytical, artistic, and personal investigation is an effort to provide a visual representation of research, writing, and imagery for the student body and college to engage with. The book will also be presented alongside several handmade editions at the final studio art senior thesis exhibition on April 17th. The presentation of the work at the 2025 Expo will comprise the research paper, the book, as well as hung images to present the project in its full capacity.

Department of Theatre and Dance

16. Symbology and Semiotics in Samm-Art Williams' Home ♻️
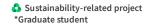**Student Presenter: Christopher Warzynski**
Faculty Mentor(s): Lauren Duffie

In the 2024 College of Charleston production of Samm-Art Williams' seminal play, Home, much of the design was created with an extremely minimalist flair. This research and design project explores how minimalist design can be accomplished in the Theatre and how designers must work together in order to bring a nontraditional concept to the forefront of the contemporary stage. The project explores how symbology and semiotic concepts can help bring holistically evocative design elements to a production. The project also explores how the roles of designer and actor must be balanced in order to create new forms of immersive performance.

17. The Tragedy of Macbeth
Student Presenter: Aidan Wunderley
Faculty Mentor(s): Todd McNerney
Additional Authors: Gray Crews, Morgan Kelly, Jay Davis, Grace Ratledge

The Tragedy of Macbeth is a Shakespearean classic. The cursed play, also called "The Scottish Play," tells the story of Scottish general and Thane Macbeth. After being visited by three witches who prophesied the plot of the play, Macbeth goes on to fulfill that prophecy, killing the king of Scotland in order to take the throne for himself. Ultimately Macbeth's undoing comes at the hand of his own ambition and paranoia as he's beheaded by Macduff. The play has been produced globally, and recently, as a twenty-minute piece in the Director's Showcase with the Department of Theatre and Dance at the College of Charleston. Directed by Aidan Wunderley, this production of Macbeth chooses to focus on the character of Lady Macbeth. Serving as a character study, Macbeth's themes of power, greed, ambition, and paranoia are explored through a feminist lens focused on Lady Macbeth. In the play Lady Macbeth is defined by her husband, yet she is the driving force behind much of Macbeth's greed. Throughout the play, Lady Macbeth's choices greatly influence the plot. This production of Macbeth uses select scenes and a reverse linear narrative structure to explore Lady Macbeth's choices, goals, and the femininity she rejected to achieve them. The themes of this character study production of Macbeth are further explored through modern dance inspired movement, music from the album Lush by Mitski, and powerful performance. This production of Macbeth carefully considers the complexities of Lady Macbeth while inviting the audience into a deeper understanding of her character.

SCHOOL OF BUSINESS

Department of Economics

18. Chinese Economic Influence and Democratic Backsliding in Latin America and the Caribbean: Examining Political and Economic Dynamics ♻
Student Presenter: Maeve Ridings
Faculty Mentor(s): Beatriz Maldonado

Since the 2013 launch of the Belt and Road Initiative, BRI, China has expanded its role as a major global trade partner and development financier. Unlike Western aid, which often ties financial support to democratic reforms, China's non-interference policy allows it to fund economic development without political conditions. This study examines how China's economic influence affects democratic backsliding in 18 Latin American countries. This study aims to isolate the impact of Chinese economic engagement on regional democratic trends. It assesses China's political influence through measures such as UN voting alignment and financial investment patterns. The findings will contribute new insights into how external economic relationships shape democratic governance in Latin America, a politically diverse region with varying levels of institutional stability.

19. Impact of Trade with European Union on Corruption Levels ♻
Student Presenter: Sydney Swarbrick
Faculty Mentor(s): Jessica Madariaga
Additional Authors: Beatriz Maldonado

As global trade reaches unprecedented levels, it serves as a crucial driver of economic growth for developing and developed nations alike. However, in an increasingly interconnected world, corruption remains a pervasive challenge. This paper explores the complex relationship between international trade and corruption, examining whether trade acts as a deterrent to corrupt practices or instead facilitates their expansion. Specifically, we analyze this relationship between trade and corruption in 33 African, Caribbean, and Pacific (ACP) nations trading with the European Union. The Cotonou Partnership Agreement (CPA) intended to bring the two regions together to enhance the social and economic development of the ACP nations through trade, with specific targets to reduce corruption in ACP nations under its good governance initiatives. However, the success of this partnership in reducing corruption remains uncertain. This research investigates whether the good governance conditions tied to the trade agreements influenced corruption levels in ACP countries. Using a difference-in-difference framework and a panel of 33 ACP countries between 2000 and 2018, this study tests if trade with the EU impacts corruption in ACP nations.

20. The Spillover Effect of Historic Preservation Districts
Student Presenter: Jackson Van Horn
Faculty Mentor(s): Chris Mothorpe

Historic preservation districts are designed to protect architectural heritage, maintain neighborhood aesthetics, and promote home values. However, the strict regulations imposed on homeowners requiring historically accurate repairs and materials may inadvertently discourage timely maintenance. This study examines how these restrictions contribute to deferred property upkeep by analyzing code violations in Charleston, South Carolina, and their effect on home sale prices. Using public records of code violations and real estate transaction data, this research explores the relationship between the frequency of violations near a property and its market value. The analysis finds that for every 1% increase in surrounding code violations the home sale price will decline by 7.49%. The findings provide insight into the unintended economic consequences of historic preservation policies,

highlighting how regulatory burdens may lead to increased code violations and, ultimately, impact the housing market.

21. Health Implications of Global Development ♻
Student Presenter: Chloe Goff
Faculty Mentor(s): Beatriz Maldonado

As countries develop, so do their health challenges. My Bachelor's Essay examines the social, economic, and institutional factors driving shifts in disease patterns as outlined by the Epidemiological Transition Model (ETM), with a focus on the changing balance between communicable and non-communicable diseases. In low- and middle-income countries, advances in health infrastructure and sanitation are effectively reducing rates of infectious diseases, but chronic conditions like heart disease, diabetes, and obesity are on the rise due to maturing populations, lifestyle shifts, and urbanization. The shift in disease patterns creates a double burden of disease, where infectious and chronic illnesses strain healthcare systems simultaneously. By examining these patterns across different regions, this paper seeks to evaluate why these shifts in disease patterns are occurring while understanding how public health infrastructure can address both challenges in LMICs, ensuring that progress in one area does not come at the cost of another.

Department of Finance

22. Beyond the Coastline ♻
Student Presenter: McKenzie Daniel
Faculty Mentor(s): Weishen Wang

This study examines the correlation between increasing climate-related disasters and rising insurance premiums in coastal states, focusing on the broader financial and economic impacts. Data from NOAA, CBO, and academic research reveal a concerning trend: over the past decade, coastal insurance premiums have surged by more than 30%, driven by more frequent storms, floods, and billion-dollar disasters. This increase places significant financial pressure not only on those directly affected but also causes spillover effects impacting individuals and businesses beyond the disaster zones.

23. How Does the Variation Between Economic Industries Affect the Success of Technical Analysis?
Student Presenter: Griffin Lynch
Faculty Mentor(s): Hao-Chen Liu

Using a set of technical analysis indicators, we investigate the change in returns across industries. From the Fama-French 12 Industry classification, we construct 12 portfolios of representative stocks over a 30-year period. The Average Directional Index (ADX) and various Simple Moving Averages (SMAs) are utilized to assess the efficacy of technical trading under these sector portfolios, offering a greater context to technical trading with regard to industry specific circumstances.

Department of Hospitality and Tourism Management

24. Accessibility Challenges Faced by Wheelchair Users and Visually Impaired Individuals in Dining Experiences
Student Presenter: Hannah Hyatt

Faculty Mentor(s): Stephen Litvin

Dining out is a significant social experience, yet individuals with mobility and visual impairments often encounter barriers that limit their full participation. This study examines the challenges faced by wheelchair users and visually impaired individuals separately to identify areas of overlap and develop solutions that accommodate both groups. Using a mixed-methods approach, data were gathered through surveys and in-depth interviews with wheelchair users and legally blind individuals. Participants shared firsthand experiences related to physical accessibility, menu navigation, staff assistance, and environmental factors such as lighting and noise levels. Findings emphasize the urgent need for restaurants to adopt more inclusive design practices and enhance staff training to improve accessibility. Key recommendations include exceeding minimum ADA guidelines, implementing comprehensive staff training to better assist these customers, and bringing greater awareness to diverse accessibility needs. By addressing these challenges, restaurants can create a more welcoming and equitable dining environment for all.

25. How Charleston and Its Local Businesses Are Affected by Growing Tourism
Student Presenter: Riley Johnston
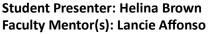**Faculty Mentor(s): Stephen Litvin**

The flourishing tourism sector in Charleston has had a significant impact on local companies, the city's culture, and the standard of living for its citizens. Through a case study of Tommy Condon's Irish Pub, a venerable institution in the city's French Quarter, this study explores these consequences. The study examines the advantages and difficulties presented by this expanding industry by examining qualitative data from employee interviews who have direct knowledge of the development of tourism. On the one hand, tourism has supported local companies, increased job stability, and stimulated economic growth. On the other hand, it has changed Charleston's social and cultural character, increased living expenses, and put pressure on resources. The results highlight the necessity of sustainable tourism practices in order to strike a balance between maintaining the city's distinctive identity and livability and maintaining economic viability. Tommy Condon's provides a sophisticated knowledge of the relationship between local culture and a thriving tourism industry, acting as a microcosm for these larger dynamics.

Department of Management and Marketing

26. Star Power or Star Paradox? Assessing the True Impact of Celebrity Endorsements on Brand Success
Student Presenter: Corinna Baker
Faculty Mentor(s): Scott Greene

Celebrity endorsements are a powerful marketing tool that help brands build recognition, trust, and consumer engagement. However, they can also pose risks, such as misalignment between the celebrity and brand, scandals that can damage brand reputation, or the "Vampire Effect," where the celebrity endorser overshadows the product itself. This research explores when and how endorsements contribute to brand success or failure, examining their impact on brand perception, consumer behavior, and brand equity. Through the use of a Student Research Pool Survey, this study evaluates key factors influencing endorsement effectiveness, providing insights for optimizing branding strategies and mitigating risks in an increasingly competitive advertising landscape. This research contributes to marketing science by advancing theories of consumer behavior and advertising effectiveness, particularly in relation to brand recall, trust, and purchase intent. The study also provides practical insights for marketers, helping them navigate the risks of celebrity partnerships and develop more strategic, data-driven endorsement campaigns. Additionally, the study explores the growing saturation of advertising and the potential desensitization of consumers, encouraging more authentic and meaningful brand-consumer relationships. By identifying the conditions for successful endorsements, this research ultimately promotes more ethical, effective, and consumer-focused marketing practices.

27. Diversity is Good for Business and Good for America ♻
Student Presenter: Helina Brown
Faculty Mentor(s): Lancie Affonso
Additional Authors: David Byrd, Alexandria Redd

This project presents the research recommendations of the College of Charleston's team at the January 2025 National Diversity Case Competition at Indiana University, aiming to boost diversity in accounting careers. In this case, Grant Thornton seeks to hire 30% of new employees from minority backgrounds, currently achieving 58% of this goal according to their 2023 DE&I report. McKinsey & Company reports that gender-diverse executive teams are 21% more likely to be profitable, and ethnically diverse teams 33% more likely to lead their industry. The AACSB highlights diversity as crucial for business success, embedding DEIB in 6 out of 9 business accreditation standards globally. Business schools play a key role in promoting diversity through inclusive recruitment, diverse curricula, and support for minority students, preparing them for a global workforce. Considering recent declines in DEI initiatives, business schools must lead by example. Partnering with organizations for mentorship programs and scholarships can support underrepresented groups and build a diverse leadership pipeline, benefiting businesses and fostering an inclusive society.

28. Marketing Digital Wellness: A Study of the Implications of Branding Wellness Initiatives ♻
Student Presenter: Elizabeth Clarke
Faculty Mentor(s): Kelley Cours Anderson

In the current age of technology, recognizing and maintaining digital wellbeing is more important than ever. According to research published on the National Library of Medicine (2022), "Studies have shown a negative impact of excessive gadget use leading to a decline in performance rates, effect on sleep patterns, and reduction in workplace achievements thereby causing hindrance in unlocking the maximum potential of an individual." Digital Wellness initiatives around the globe are seeking to educate people about the need for limiting screentime and technological use. This research project aims to explore how to market these campaigns and initiatives in an effective and insightful way. How does one market an initiative using the very method it is trying to protect people from? The aim is to share these insights within academic and industry communities via conferences and a published case study.

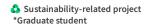**29. Sustainable Housing for a Sustainable Future** ♻
Student Presenter: Bella Cocimano
Faculty Mentor(s): Lancie Affonso

Sustainable housing is a vital response to environmental degradation, promoting energy-efficient, eco-friendly living spaces. These homes use designs, materials, and technologies that minimize environmental impact and conserve resources over the long term. Key sustainable practices include renewable energy sources, energy efficiency through solar designs, and water conservation techniques like rainwater harvesting. Energy-efficient homes feature high-performance insulation, energy-efficient appliances, and cool roofs, reducing reliance on fossil fuels and lowering carbon footprints. By using locally sourced, sustainable materials and waste-reducing construction methods, these homes further contribute to environmental preservation. Integrating renewable energy decreases dependence on grid power, significantly reducing greenhouse gas emissions. Beyond environmental benefits, sustainable homes create healthier living spaces by reducing exposure to harmful chemicals and promoting natural ventilation. This approach helps preserve the environment and supports a cleaner, healthier way of living, which will be explored through data on sustainable housing methods.
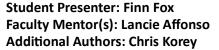
30. Exploring Bear Cognition's Role in Modernizing Supply Chain Management
Student Presenter: Maddie Crawshaw
Faculty Mentor(s): Lancie Affonso

Artificial Intelligence is revolutionizing industries worldwide. While automotive innovations in computer science and engineering often make headlines, AI's transformative power extends to many less-publicized sectors, including supply chain management. This industry leverages AI to enhance global transportation efficiency. Supply chain planning involves two crucial steps: predicting demand from historical economic data and optimizing forecasts using algorithms for optimal stocking decisions. This complex process faces numerous challenges in achieving accurate forecasting. Integrating AI aims to improve the accuracy and efficiency of supply chain forecasting and optimization. Bear Cognition, based in Charleston, South Carolina, harnesses AI within their platform to produce more precise and effective outcomes. Their use of AI spans demand forecasting, lane optimization, profitability reports, inventory visibility, warehouse management, and more. This project will explore Bear Cognition's platform and analyze the opportunities AI presents for the intricacies of supply chain management.

31. Clyde the Chatbot and Meta-Major ♻️
Student Presenter: Finn Fox
Faculty Mentor(s): Lancie Affonso
Additional Authors: Chris Korey

Colleges that do not require students to declare a major upon application are increasingly adopting meta-majors, broad academic categories that encompass related fields of study. Meta-majors provide students with structured opportunities to explore potential academic and career pathways while connecting with peers who share similar interests. At the College of Charleston, meta-majors serve as an intentional framework for students who may be uncertain about their future aspirations. The Provost's Office emphasizes that this initiative benefits all students, regardless of whether they have a clear academic direction. By leveraging data-driven insights and artificial intelligence such as Clyde the Chatbot, the College continues refining the meta-major system to enhance its accessibility and efficiency.

32. Shaping Future Leaders: The German-American Business Summit at CofC ♻️
Student Presenter: Bennett Giammo
Faculty Mentor(s): Lancie Affonso

The German-American Business Summit offers a unique opportunity for College of Charleston students to connect with the growing presence of German companies in South Carolina. As companies like BMW, Mercedes-Benz, and Continental continue to expand their manufacturing operations, students will gain valuable insight into the impact of foreign direct investment on the state's economy, job market, and global trade. The summit not only deepens their understanding of international business but also provides important networking opportunities that could lead to future career prospects in industries driving South Carolina's economic growth. This project highlights the significant role of foreign investment preparing students to contribute to the state's evolving industrial landscape.

33. Social Media's Impact on Mental Wellness and Digital Wellness at the College of Charleston
Student Presenter: Zoe Mulqueen
Faculty Mentor(s): Kelley Anderson

The increased use of technology and social media platforms, particularly by the Gen Z population, has led to burnout, emotional exhaustion, isolation, anxiety, and other adverse psychological effects. Indeed, the accuracy and sophistication of social media platform algorithms make matters worse for young users - highlighting and delivering content that highlights their insecurities and makes them more withdrawn. In my research, I find that social media users increasingly want to detox digitally for digital wellness but have trouble finding the outlet and mental space to do so. By combining qualitative research of interviews with students with quantitative analysis of a tracker study, I reveal that College of Charleston students feel social media burnout but have difficulty unplugging. In addition, my research on student tracker surveys and participant observation reveals a dire need for digital wellness on the college campus. Thus, for this case study, I share insights from creating a digital wellness student organization at the College of Charleston to promote digital and social well-being and help students build healthy habits through various interactive activities to navigate their day-to-day lives better.

♻️ Sustainability-related project
*Graduate student

34. Think Before You Toss: Sustainability & Cougar Changemakers ♻
Student Presenter: Hailey Orr-Depner
Faculty Mentor(s): Lancie Affonso

The Cougar Changemaker program aims to improve the College of Charleston through creating more sustainable practices. Students submit ideas for sustainable and environmental improvements; some are selected to use up to $5,000 to carry out the task. For our proposal, we focused on improving recycling efforts in the college buildings by advocating for an increase in recycling bins in every building. Currently, there are limited recycling options available, which leads to a lot of recyclable materials ending up in the trash. The goal of my project is to raise awareness about the importance of recycling and make it easier for students and staff to properly dispose of recyclables. By adding bins to each building, we hope to create a more sustainable environment and encourage everyone to take responsibility for reducing waste.

35. Secondary Markets of Counterfeits
Student Presenter: Eva Tryon
Faculty Mentor(s): Rene Mueller

Consumer's willingness to purchase counterfeit products due to their affordability and perceived social status benefits is driving the secondary market for counterfeit goods to continue to succeed. This study examines the factors influencing college students' awareness, attitudes, and purchasing behaviors regarding counterfeit goods. A questionnaire was administered to 75 college students to assess their knowledge of counterfeit products, motivations for purchasing, and perceptions of brand authenticity. The findings suggest that affordability and the desire for luxury brand association are primary motivators for purchasing counterfeits. Additionally, results indicate that students are generally able to distinguish counterfeit goods from authentic ones and make intentional purchasing decisions. The study provides insights into consumer's motivations for purchasing counterfeit goods and sheds light on the growing normalization of counterfeit purchases among younger demographics and their harmful impacts on the global economy. Understanding these consumer behaviors can help policymakers and brands develop more effective strategies to combat counterfeiting while addressing the underlying demand.

36. Understanding TikTok's Algorithm ♻
Student Presenter: Claire Varnum
Faculty Mentor(s): Lancie Affonso

TikTok's appeal lies in its personalized features that keep users scrolling. This project aims to explain how AI influences the algorithm that customizes TikTok videos. The "For You Page" suggests content based on user preferences, employing an "interest graph" approach to focus on likes and dislikes rather than connections. It combines discovery and relevant entertainment (How TikTok Changed the Social Media Game with Its Unique Algorithm). The project will explore the algorithm's role in TikTok's popularity, its addictive nature, and its unique features. In the U.S., 170 million monthly users spend an average of 95 minutes daily on TikTok, exceeding other social media platforms (TikTok Statistics You Need to Know). The recent TikTok ban has also further increased its visibility.

Department of Supply Chain and Information Management

37. Lean Thinking in Port Management: Strategies for Productivity and Waste Reduction ♻
Student Presenter: Fredrikke Foss
Faculty Mentor(s): Marvin E. Gonzalez
Additional Authors: Batson, Ben; Fordney, Joe

♻ Sustainability-related project
*Graduate student

Port operations play a crucial role in global trade, yet inefficiencies such as congestion, resource mismanagement, and delays continue to hinder productivity. This study investigates the application of Lean thinking tools in a hypothetical port setting to optimize operations, enhance competitiveness, and drive sustainable growth. Lean methodologies, including 5S, Kanban, and DMAIC, are analyzed for their effectiveness in addressing key challenges such as crane utilization, yard organization, and gate management. A mixed-method approach is employed, integrating best practices from leading ports, expert consultations, and an in-depth review of Lean applications in maritime logistics. The study reveals that Lean tools significantly improve operational efficiency by eliminating waste, optimizing workflows, and enhancing resource allocation. A structured strategic framework is developed to guide port managers in implementing Lean principles systematically. This framework provides actionable steps for reducing bottlenecks, improving cargo flow, and fostering a culture of continuous improvement. The findings underscore the critical role of workforce training and Lean culture adoption in achieving sustainable operational excellence. By implementing targeted Lean strategies, ports can enhance service reliability, minimize turnaround times, and strengthen their competitive positioning in the global supply chain. This research contributes to the field by bridging the gap between traditional port management practices and modern efficiency-driven strategies. The strategic framework presented in this study serves as a valuable resource for port authorities, policymakers, and industry leaders seeking to drive operational efficiency and long-term resilience in maritime logistics.

38. Benchmarking the Competitiveness of South Carolina Ports in the U.S. Maritime Industry: A Strategic Analysis
Student Presenter: Shane Love
Faculty Mentor(s): Maryam Mahdikhani

South Carolina Ports Authority (SC Ports) significantly impacts South Carolina's economy, generating $87 billion annually and supporting thousands of jobs. In a competitive maritime sector, maintaining and enhancing its national standing is critical. This research evaluates the Port of Charleston's position within the U.S. maritime industry by analyzing its ranking, key competitive factors, and strategies for outperforming rival ports. Using a dataset of over 4,000 observations, a benchmark analysis was conducted via Power BI to compare Charleston's performance with its closest competitors. Key variables included geographic region, state-by-state port performance, net tonnage volume, and cargo types. The study focuses on Charleston's positioning relative to the Port of Savannah and Jacksonville Port, its most comparable East Coast rivals. Findings indicate a strong correlation between increasing net tonnage, strategic infrastructure optimization, and improved rankings. Ports that expanded capacity, streamlined logistics, and diversified cargo handling saw notable competitive gains. The study identifies factors enabling rival ports to excel and outlines strategies SC Ports can adopt to strengthen its market position. Key recommendations include investing in infrastructure, leveraging technology for efficiency, expanding service offerings, and fostering strategic partnerships. By implementing these measures, SC Ports can reinforce its national standing, enhance economic contributions, and ensure long-term success in the evolving U.S. maritime landscape.

SCHOOL OF EDUCATION

Department of Teacher Education

39. How Foster Care Systems Influence Childrens Trajectories
Student Presenter: Charlotte Barry
Faculty Mentor(s): Laura Brock

The foster care system in the United States is flawed, the transition for children once they turn eighteen leaves them with little to no support. Young people who have been in foster care often are more likely to do worse in school, commit a crime, and become unhoused once out of foster care. Though the system can be effective when children are placed in a family, children are often aged out of the system and left unsupported. According to the Federal Adoption and Foster Care Analysis and Reporting System, in 2006, 510,000 children were in an out of home care system. The foster care system impacts the youth of America and should be set up in order to best prepare them for society. By comparing our system to that of other countries, it can be determined what potential changes could be made in order to better support the youth in our care systems.

40. How Do Parenting Styles Influence Parenting in Subsequent Generations? ♻
Student Presenter: Charlie Bertsch
Faculty Mentor(s): Laura Brock

Parenting plays a pivotal role in shaping a child's future, influencing their emotional and social development and their approach to raising their children. There are different societal norms and family structures everywhere, and the influence of parental practices on future generations is individual. This study will examine how the many approaches to parenting styles, including authoritative, authoritarian, permissive, and uninvolved, affect children's future parenting choices. Does exposure to nurturing, structured environments lead to more balanced parenting in adulthood, or do children mirror or reject the methods of their parents?

41. The Influence of Teenage Work Experience on Social Development in Early Adulthood Across the U.S.
Student Presenter: Addison Bryant
Faculty Mentor(s): Laura Brock

Working as a teenager in the United States significantly infuses social development, cultural understanding, and the development of a young individual transitioning into early adulthood. Employment during adolescence shapes one's character, decision-making, and outlook on personal and professional life. As different chapters start to shape one's future, so does one's past experience with responsibility. Not only does engaging in customer service, money handling, time management, and tasks affect one's knowledge, but it also helps guide a person on their decisions for the future. Regardless of whether a teenager comes from a high or low-income family, the practice of employment truly shapes one's self. By analyzing the impact of teenagers' psychological behaviors on employment, we can better understand how early work experiences influence adult social and emotional skills.

42. How Does Growing up in a Single Parent Household Influence Childhood Development?
Student Presenter: Avery Butler
Faculty Mentor(s): Laura Brock

I am researching how growing up in a single parent household influences child development. Throughout this project I plan to research how children's upbringings vary based on whether both parents are present. I will be looking into different factors such as support systems, financial situations, which parent is present (mom or dad) and where the family lives. These factors play an influential role in how the child is brought up and how they are raised. This is an important topic because many children are raised with only one parent, whether it be parental

divorce or death, the way a child is raised greatly plays a role in who they will be when they grow up. Children look up to their parents for guidance and only having one figure puts more pressure on the present parent. I will research how children lose or gain knowledge when only having one parental figure in their lives. Research may point to single parents as more influential on their child's development, compared to two parent households.

43. Scars of Conflict: The Effect of Political Violence on Adolescent's Moral Development ♻
Student Presenter: Hannah Harvey
Faculty Mentor(s): Laura Brock

In the midst of wars and political conflict, no one is spared from the effects of the violence imposed on the area, including the civilians. They experience a sudden plunge into unsafe and unstable environments where their intrinsic developmental priorities become skewed. Adolescents in the height of their moral development have shown major stunts to their social capabilities including their moral judgment, while also more commonly developing mental health disorders that directly correlate to immorality. In 2024 there were over 165,000 political violence related crises worldwide, which is 64% higher than the past 4 years. With increasingly volatile global political relations, children are forced to grow up in households that lack room for proper nurturing and empathy, traits that directly breed a sense of morality. These unstable environments are causing more children to grow up disconnected from prominent characteristics of a modern society that affect both their development and interactions. With new conflicts arising worldwide each year, many adolescents are left to navigate their lives in an unpredictable way that causes their maturing psyches to experience life and society from a warped perspective, leading them to become increasingly socially deviant and disrupt the natural flow of society. By focusing on the impact of these conflicts on new generations, this research can be used to understand and attempt to combat these effects, or rehabilitate these adolescents into more socially aware and functioning citizens.

44. The Effect of Disabilities on Youth Mental Health
Student Presenter: Fiona Hiller
Faculty Mentor(s): Laura Brock
Additional Authors: Olivia Hollier, Natori Williams, Riley Peloquin, Grace Leoni

Disabilities both physical and intellectual present adversity in various forms. In this research poster we will be looking into how having a disability as a child can affect one's mental health as they develop. We will research both physical and intellectual, and discover how these specific disabilities take form and influence the minds of those with these conditions. The research shows that intellectual and physical disabilities have a direct impact on an individual's mental health. A survey conducted in Australia has found that post disability diagnosis 19.1% of youth experienced higher depression and anxiety. The study was conducted by a repeating mental health questionnaire. The participants were asked once a week for 4 weeks to rank their feelings of depression and anxiety from all the time to none of the time. This study shows the correlation of disabilities and mental health in youth.
Our research is important for other people to know about because it will bring awareness and recognition to the children whose disabilities cause a reduction in their wellness. The mental health of children is vital to their development and it is essential that we research the effects that their conditions have on them. Our research will prevent and stop the decline in the children's growth alongside helping the children's emotional well-being. Our research will affect the children in need, their loved ones, caretakers, the disabled community, and many more.

45. Affected by Addiction Without Taking a Drug
Student Presenter: Maura Hyland
Faculty Mentor(s): Laura Brock

Drug and alcohol abuse and disorders are a prevalent issue in the United States, and while treating those with the disease of addiction is crucial, supporting and treating those who are affected by someone else's addiction is just as important. Children that live with a parent battling a substance use disorder are at a higher risk of developing poor social, emotional, behavioral, and cognitive problems. Research has also found that over 21 million children lived with a parent that has misused any substance, and over 2 million lived with a parent that had a SUD. The environment a child is raised in affects many aspects of their lives in the future. The long-lasting effect of

encountering an addicted parent impacts the child's future relationships with themselves and with others. The stigma around addiction prevents many addicts from seeking help which only prolongs the cycle of addiction. Similarly, the shame and embarrassment of having an addicted parent keeps the child from seeking support of their own whether mental or physical. The next step of this issue is to treat everyone touched by addiction, overcome the stigma and shame surrounding it, and create healthier and happier childhoods.

46. How does being bilingual affect childhood development
Student Presenter: Lia Kiniry
Faculty Mentor(s): Laura Brock

Around 66% of kids around the world grow up bilingual meaning they speak more than one language. As a result, kids face many developmental challenges as they navigate learning in different languages. However researchers have shown that being bilingual is very beneficial. Research finds that kids who are learning two different languages have a harder time learning numbers, reading, and writing because they are learning different languages with different vocabulary, grammar, and syntax. This research is important because it shows the challenges young kids face but also the benefits later down the line when it comes to learning more than one language.

47. Why is Homeschooling Harmful for Children's Social Skills?
Student Presenter: Maura McGrath
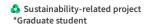**Faculty Mentor(s): Laura Brock**

Homeschooling young children has always been a concern and complex decision to make. Due to extreme circumstances such as COVID-19 and the rise of public and private schools becoming unsafe, more parents are choosing to homeschool their children. While this eliminates the uneasy feeling of not being with your child at school, there are detrimental effects on their social skills and interactions. Research states there are advantages to homeschooling, such as students scoring higher on family and community scores of the ABIC. Along with more one-on-one instructor time, compared to those in a 25 to 1 ratio in public school. While it was found those that are homeschooled struggle to interact with new procedures and struggle in uncomfortable situations. While it is important as a parent to weigh what may be most beneficial for your family and child it is crucial to acknowledge the future issues that could arise for your child later on. Lack of social interaction with other children everyday could lead to issues with expressing feelings, social awareness, and self esteem. To eliminate the uneasy feeling parents have with unsafe school environments I believe is the root of homeschooling, policies and practices to improve school climates could be put into place.

48. The Importance of Education Pre-Kindergarten
Student Presenter: Maeve Mulvihill
Faculty Mentor(s): Laura Brock

The lack of accessible and quality preschool education is prevalent globally. Without available preschools for students, they may not be able to participate in school until kindergarten, which is not ideal for proper development. Education pre-kindergarten is absolutely vital for children in order for them to be prepared to further their educational journeys. Research highlights that children who do not receive education prior to kindergarten have a hard time socially and they struggle with keeping up in the classroom with their fellow students. Unfortunately, preschool is not readily available for everyone and they may not have the resources to send their childhood to school before kindergarten.Without an introduction into the school systems, students may be unprepared socially and mentally for kindergarten and furthermore sets them back for the rest of their lives. Preschool and education before kindergarten should be accessible for everyone in order to properly prepare future generations for success.

49. Wake-Up Call: First Year Teachers' Experiences Entering the Classroom
Student Presenter: Hailey Saul
Faculty Mentor(s): Carlos Lavin

Entering the teaching profession is often romanticized. Despite extensive preparation, however, many first-year teachers experience a profound "wake-up call" as they transition from student-teaching into full-time classroom instruction (i.e., intensive workloads, administrative demands, behavior management, and lack of institutional support). This study utilizes thematic analysis to uncover the recurring themes in their struggles, support systems, or coping mechanisms. At the time of this study, all participants were at the end of their first or second year teaching and worked in diverse school settings. Findings revealed that most teachers struggle during this transitional period from student teaching to being a full-time teacher providing insight into the most pressing challenges such as paperwork, limited mentorship, and the struggle to maintain work-life balance. These findings point to a need for stronger mentorship programs to aid in this transition, and other systemic changes that can improve first-year teacher experience and retention. Future research should explore longitudinal data on how these early challenges impact long-term teacher retention.

50. Influence of Adoption on Child Development Post Institutionalization
Student Presenter: Reagan Scully
Faculty Mentor(s): Laura Brock

The Bucharest Early Intervention Project is a fascinating study that researches early foster care and institutional care's effects on child development. Charles Zeanah, Nathan Fox, and Charles Nelson instigated this study, leading a team of researchers in the early 2000s. They focused on Romanian orphans who were placed in institutional care and Romanian orphans who were placed in foster care at young ages. They assessed the cognitive, social, and emotional development effects that these types of care have on the participants. Research indicates earlier intervention can lead to typical developmental trajectories, whereas later intervention suggests missing environmental inputs during critical periods for development may lead to lifelong delays. This research highlights the importance of providing supportive early environments for optimal development and can inform policy decisions globally.

51. Addressing the Mental Health Needs of American School Children
Student Presenter: Renee Vaysman
Faculty Mentor(s): Laura Brock

According to research, recent political trends in US schools show increasing recognition of the rising rate of mental health issues among school-aged children. Using different assessments and developing new approaches, such as school-based mental health programs, can help provide comprehensive evaluations of children who may have undiagnosed mental health challenges. In recent years, the District and Charter Network Leaders in the American School District Panel highlighted students' mental health as one of their primary concerns. This subject was deemed more important than others, such as student attentiveness, disciplinary measures, punctuality and attendance, and decreasing school enrollment. As stated in the scholarly article by Mary Beth Meier, An Analysis of Adolescent Mental Health According to the Social Work Competencies Identified in the Council on Social Work Education, "Going beyond the mere absence of a disorder, the World Health Organization defines mental health as 'a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her own community'". Overall, a productive and fruitful life cannot develop by itself; government support, the environment in which a school-aged child lives, family life, and family support are all necessary to guarantee psychological and educational stability. How can mental health issues in school children be addressed effectively at local, state, and federal levels so that students are recognized, included, and on the road to success?

52. Transition from Foster Care to Adulthood
Student Presenter: Tyler Young
Faculty Mentor(s): Laura Brock

The foster care system has long struggled to provide stable, long-term support for children, often leaving them without strong family ties or adequate resources once they turn 18. Many young adults exiting foster care face challenges such as academic struggles, high trauma rates, and difficulties forming attachments. Placement stability,

caregiver quality, and access to support services significantly impact their development. While most foster youth receive Medicaid, limited provider acceptance restricts their access to essential healthcare, including dental and psychiatric care. Given these challenges, I will examine the effects of foster care on child development and long-term outcomes while exploring potential reforms. Extending support into early adulthood and preserving family connections, when possible, could provide these individuals with a stronger foundation for financial and emotional stability.

Masters of Education in Teaching, Learning, and Advocacy

53. Through Their Eyes: A Deep Dive into the Challenges Facing Arab, Muslim, and Palestinian Americans in South Carolina ♻️
Student Presenter: Haneen Dames*
Faculty Mentor(s): Will McCorkle

This presentation is based on the experiences of Arab, Muslim, and specifically Palestinian Americans in the wake of the war in Gaza and the subsequent attempts to silence voices critical of the Israeli government. Emphasis will also be placed on the experiences of these communities during the increased nativism and xenophobia during the 2024 election and in the early days of the Trump Administration. The data comes from interviews taken by the primary author among individuals in South Carolina who are part of these communities. Specific focus will be placed on how these changes could be seen in the school system both by participants who are currently in school and those who have children, nieces and nephews, and grandchildren in the school system. This paper will seek to examine how the realities of Arab, Muslim, and Palestinian Americans both was similar and different in South Carolina in comparison to the rest of the country and how the realities of communities changed both with the outset of the war in Gaza and after with the increased censorship. This paper highlights both the continuity and change of the current moment for members of the Arab, Muslim, and Palestinian communities.

SCHOOL OF ENGINEERING, COMPUTING, AND MATHEMATICS

Department of Computer Science

54. Is Broadening Participation in Computing Worthwhile?
Student Presenter: Jeriel Adejobi
Faculty Mentor(s): Lancie Affonso

Broadening Participation in Computing (BPC) seeks to increase the participation of underrepresented groups in computer science and engineering. This will help ensure that the U.S. National Science Foundation's research funding and support benefits all Americans. This research project will utilize College of Charleston student-submitted data collected from the NSF Data Buddies project to explore diversity and inclusion in computer science at the College of Charleston. Focusing on gender and racial disparities in enrollment and graduation rates, this study seeks to understand why underrepresented groups, particularly women and racial minorities, face barriers in pursuing and completing degrees in this field. The research involves analyzing institutional and departmental data, national statistics, and student retention trends. Methods include reviewing enrollment records, conducting surveys, and examining campus initiatives that aim to support diverse student populations. Findings will highlight factors influencing student persistence, such as mentorship opportunities, curriculum design, and campus support systems.

55. Environmental Risk Factors for Alzheimer's Disease: Analyzing Air Pollution Across US Counties
Student Presenter: Oliver Aschenbrenner
Faculty Mentor(s): Navid Hashemi
Additional Authors: Maja Jekauc, Dr. Abolfazi Mollalo (MUSC - Department of Public Health Science), Dr. Navid Hashemi

Growing evidence suggests that environmental factors, namely air pollution, may be a risk factor in developing Alzheimer's Disease (AD). This research focuses on exploring the relation between air pollution and AD prevalence at the county level across the contiguous United States, with grouping based on the Rural-Urban Continuum Codes (RUCC). Counties were categorized into three groups: metropolitan (RUCC 1-3), micropolitan (RUCC 4-6), and rural (RUCC 7-9) to assess influence of pollutants in different regions. Through machine learning models XGBoost, local Random Forests, and neural networks, six pollutants - $PM2.5$, $PM10$, CO, $NO2$, $SO2$, and $O3$ - and interactions between these pollutants were analyzed on AD Prevalence. Data preprocessing involved finding the median predicted weight of pollutants from 1999-2020, feature engineering, and cross-validation to optimize model performance. Feature importance results from these models showed that $PM2.5$ and $SO2$ consistently ranked high as strong predictors of AD Prevalence, and the interaction between $PM2.5$ and $PM10$ could potentially heighten AD risk. The models performance varied based on RUCC grouping, with a higher predictive power in metropolitan areas (R^2 scores of up to 0.8375 for RUCC 1-3, R^2 scores up to 0.7510 for RUCC 4-6, and R^2 scores up to 0.6533 for RUCC 7-9), suggesting air pollutants pose a higher risk for AD in more urban areas. These findings can be used in conjunction with previous research on other risk factors of AD - lifestyle, socioeconomic, medical history - to better understand what influences the development of Alzheimer's Disease.

56. SAT Based Model Calibration in Systems Biology
Student Presenter: Jay Ball
Faculty Mentor(s): Kris Ghosh

System biology models are constructed using experimental data from biology. The uncertainty in data is a challenge in the construction of computational models. The concentrations of biochemicals fluctuate depending on the physical conditions. Therefore, it is imperative the computational models are robust. In this work, a SAT based approach is proposed in the construction of system biology in which specifications are represented in linear logic

formula. The specifications are evaluated in coarser models to aid in the construction of finer models. A prototype of ERK pathways is evaluated based on the proposed formalism.

57. Memory of Wind - An Interactive Smartphone-Based Installation
Student Presenter: Taj Ballinger*
Faculty Mentor(s): Bill Manaris

This project combines big data, computer science, human-computer interaction, and artificial intelligence to produce an interactive installation inspired by global wind patterns. It is based on a multi-speaker, multi-screen, smartphone-based environment for developing interactive, distributed music and art installations. This environment allows arbitrary network connections among numerous smartphones and other computing devices (e.g., laptops), and provides synchronized delivery of sound and visual materials. Our planet is a giant fractal, with state transitions occurring across scales, from the molecular to the global. Everything influences everything else, in subtle or significant ways. Artistically, our inspiration comes from the Butterfly Effect in Chaos Theory, i.e., a butterfly flapping its wings in the Amazon could potentially affect the weather patterns in North America. Wind is viewed as the intermediary, the interface of life on this planet. This installation explores weather patterns as holistic repositories of planetary memory. Driven by statistical models of natural phenomena, real-time wind data collected from across the globe, and interactions through participant smartphones, it creates a collaborative, and hopefully meditative, visual soundscape. Participants use their smartphone accelerometers, screens, and speakers, to shape this experience. Wind patterns selected from cities worldwide become brushstrokes on a shared canvas, and invite a dynamic dialogue with the artwork. The artwork comes alive as a result of participant interaction. This hopefully encourages deep listening, observation, and potential collaboration. This project is partially funded by the US National Science Foundation and the US National Endowment for the Arts.

58. RUST BUST with AI ♻
Student Presenter: Kyle Barretto
Faculty Mentor(s): Lancie Affonso

This project develops a sensor system for shipping carriers to monitor corrosion and environmental conditions during transatlantic transport. The Mercedes Vans plant in Charleston faces significant challenges, with many supplies arriving corroded during colder months. This issue disrupts the supply chain, which spans from third-party vendors to the European main factory and finally to Charleston. To address this, an Edge Device is deployed inside shipping containers to collect real-time environmental and corrosion data. The data is analyzed using a Cloud Machine Learning Model that employs techniques like K-means clustering, Random Forest, Neural Networks, and XGBoost for accurate corrosion prediction. Results are visualized through an intuitive interface, enabling proactive supply chain decisions. The hardware system includes sensors for environmental monitoring, GPS tracking, and high-resolution cameras for visual inspections, ensuring reliable data collection during voyages.

59. Assessing Visual Reasoning in Large Language Models Using Retrieval-Augmented Generation
Student Presenter: William Branch*
Faculty Mentor(s): Navid Hashemi

Large Language Models (LLMs), such as ChatGPT, are increasingly used for multimodal generation and reasoning. While their image-generation capabilities have significantly improved, they struggle with parsing and reasoning over complex visual information. To address this limitation, ongoing research explores enhancing LLMs' image reasoning abilities. This project analyzes and assists in improving LLM image reasoning by comparing the output of different models. This project consists of four different retrieval augmented generation (RAG) models. RAG is a technique that enhances LLMs by retrieving relevant external documents to generate contextually informed responses. This reduces hallucinations and improves accuracy without extensive retraining. Each model processes research papers containing a reasonable number of graphs and figures to assess the models' capabilities in extracting information from images. The models range from a simple RAG solution where there are no vision capabilities to a complex multi-head RAG solution that combines multiple frameworks to more accurately analyze

the papers and their images. The outputs of these models are compared to determine if the vision enabled models are able to extract both accurate and useful information from the images. The goal of this project is to develop multiple advanced RAG models and use those models' output to test the capabilities of LLM image reasoning. These models act as domain experts that can be used to reason over both text and image data. The given set of research papers would determine the domain, and the model's output would reference both images and text from the given documents.

60. Exploring Splunk and SIEM Functionality for Enhanced Security Insights
Student Presenter: Diego Carvajal
Faculty Mentor(s): Lancie Affonso

In today's evolving threat landscape, Security Information and Event Management (SIEM) systems are essential for detecting, analyzing, and responding to security incidents. This project will discuss the features of Splunk as a SIEM solution, highlighting its capabilities in providing real-time visibility, advanced threat detection, and incident response. Splunk's data ingestion engine collects logs and machine data from various sources, allowing security teams to correlate events across complex IT environments. Through an intuitive dashboard, customizable alerts, and sophisticated search queries, Splunk helps analysts identify threats, investigate anomalies, and respond promptly to potential breaches with the help of AI. Key functionalities include real-time monitoring, advanced analytics powered by machine learning, and automated response workflows that reduce the mean time to detect (MTTD) and mean time to respond (MTTR). Additionally, this project explores how Splunk integrates with other security tools, enhancing overall situational awareness and efficiency in threat detection.

61. Decoding Yelp Reviews: Can AI Predict Your Rating Before You Post? A Machine Learning Approach to Customer Sentiment and Review Trends
Student Presenter: Qian Chang Gallo*
Faculty Mentor(s): Navid Hashemi

This study investigates the relationship between user-review text and ratings on Yelp to improve customer satisfaction and business ratings. The primary goal is to explore word frequency trends using the Yelp API to predict user ratings accurately. This research will focus on two datasets: the 'business' and 'review' sets. The 'business' set describes 150,346 businesses with details like type, location, and ratings, while the 'review' set contains user-generated review text and associated scores. These datasets can be merged through business and review IDs. One anticipated challenge involves differentiating businesses by type due to inconsistencies in the 'category' attribute. Natural language processing (NLP) techniques and machine learning models, such as Naïve Bayes, Support Vector Machines, and Random Forest, will be employed to develop a predictive framework that translates review text into predicted Yelp scores. This includes analyzing textual and sentiment features to identify linguistic patterns associated with different star ratings. The performance of models will be evaluated using metrics like F1-score, mean absolute error, and cross-validation. Unlike previous studies focused on sentiment analysis or specific sectors like restaurants, this research uniquely analyzes how the type of location (major city, smaller city, or town) influences user reviews and ratings. This study could provide valuable insights into customer sentiment and lead to a generalized predictive model applicable across different business categories, helping businesses optimize services and enhance customer relationships based on linguistic trends.

62. An AI Approach for Completing J.S. Bach's Last Unfinished Piece
Student Presenter: James Cyganek
Faculty Mentor(s): Bill Manaris

J.S. Bach composed over 1,000 pieces during his lifetime. His last piece was left unfinished. This piece, called Contrapunctus XIV, from The Art of Fugue collection has been studied by many musicologists. Some believe that Bach died before its completion, while others hypothesize it was intentionally left as an exercise for composers that came after him. This latter claim is supported by various pieces of musicological evidence and references. The last unfinished fugue has become a musical puzzle, prompting numerous composers over the centuries to attempt its completion. There have been over 70 attempts. The quality of these completions vary widely. Using established AI

techniques, we are analyzing the quality of these attempts of completion, against Bach's own corpus of music. We have access to most of these attempts, especially the widely-published and recognized ones, as well as all of Bach's own corpus of more than 1000 pieces (BWV corpus). Our AI approach learns from this corpus statistically rich musicological models of Bach's harmonic progressions, contrapuntal techniques, rhythmic patterns, and melodic contours. After analyzing the corpus and completions of the unfinished fugue, we will use an AI technique based on genetic algorithms to produce our own version, informed heavily from Bach's cannon, as if the dead master wrote it himself. In the end, we hope this will serve not only as a study of how to complete a historical musical puzzle, but also as an exploration of Bach's compositional genius. We will present results, and additional ongoing work.

63. Predicting Student Enrollment in Online Higher Education Using Machine Learning
Student Presenter: Laura Diaz*
Faculty Mentor(s): Navid Hashemi

The rapid expansion of the EdTech sector, driven by increasing digital adoption and rising demand for online education, has led to a surge in potential leads. With the online education market expected to reach $374.3 billion by 2026, institutions must allocate resources effectively by identifying prospects most likely to convert into paying customers. This study examines a dataset from a higher education institution to develop a machine learning model for predicting lead conversion, addressing challenges like high competition and low conversion rates. The dataset contains over 4,500 entries and 15 features, providing a strong foundation for analysis. Data exploration and preprocessing involve handling missing values, encoding categorical variables, and visualizing distributions. Feature engineering is applied to select and transform relevant features, improving predictive accuracy. Decision Tree and Random Forest algorithms are trained and evaluated, with hyperparameter tuning and cross-validation optimizing model performance. Feature importance analysis highlights key factors influencing conversion. Findings show that the Random Forest model outperforms other methods in predicting lead conversion. Key predictors include occupation, first interaction channel, and profile completion. Based on these insights, the study recommends targeted marketing strategies that focus on high-converting demographics and engagement channels while enhancing the customer experience. This research provides actionable insights and a predictive framework to enhance lead conversion efficiency, supporting data-driven decision-making for marketing and sales efforts in online education.

64. Who Owns AI Content?
Student Presenter: Bo Dwyer
Faculty Mentor(s): Lancie Affonso

The rapid advancement of Generative Artificial Intelligence (AI) has challenged traditional notions of intellectual property (IP) ownership, raising pressing legal, ethical, and economic questions. This project explores whether AI-generated content should belong to the original creator, the AI-user, the entities that develop these technologies, or even the AI system itself. It intends to start a discussion on key debates in patent law, copyright, and the need for new legal frameworks for issues like AI inventorship, and the concept of originality. AI's strengths in rapid iteration, permutation, and personalization lends itself to the integration into various industries, including education, health, and service. This project will examine in which fields it can be used effectively and ethically. If AI was used to assist in the creation of a work, does acknowledging its role make its use allowable? How does assistance differ from authorship? This project will explore how AI and human collaboration will shape intellectual ownership. By presenting these dilemmas in an engaging format, this project intends to create a discussion on the evolving landscape of AI and IP: Who owns AI Content?

65. Finding the Perfect Match: A Machine Learning Approach to Romantic Compatibility
Student Presenter: Sammy Eubank*
Faculty Mentor(s): Navid Hashemi

Presently, online dating is more popular than ever, many users struggle to find meaningful and compatible matches. The challenge lies in the inefficiency of current matchmaking algorithms, which often fail to account for deeper compatibility factors beyond basic preferences. This project aims to develop a machine learning model that can

enhance the accuracy of dating recommendations by analyzing key factors such as shared interests, personality alignment, and demographic similarities. By using three datasets including the Speed Dating Experiment dataset, OKCupid Profiles dataset, and Big Five Personality dataset, this research will extract meaningful patterns in human attraction and relationship success. The methodology includes feature engineering to quantify shared interests, personality trait alignment, and attractiveness scores. This research explores various machine learning approaches to predicting compatibility, testing multiple feature selection and modeling techniques to determine the most effective predictive framework. The compatibility model will be evaluated using both binary classification (match vs. no match) and a ranking-based scoring system to assess the probability of a successful match. Evaluation metrics such as accuracy, precision-recall, and F1-score will be used to ensure reliability, along with cross-validation techniques to enhance model robustness. This research has broad implications, not only for improving online dating algorithms but also for understanding human relationship dynamics through data-driven insights. By combining psychology and machine learning, this study provides an innovative approach to predicting romantic compatibility. The results of this project could help refine compatibility systems for dating platforms and offer deeper insights into the study of successful relationships.

66. How do we attract Women and Latinas to Computer Science?
Student Presenter: Keisha Gonzalez
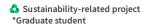**Faculty Mentor(s): RoxAnn and Lancie Stalvey and Affonso respectively**

As a Latina woman studying Computer Information Systems and Data Science, I have noticed a lack of representation in my community and found it challenging to network with other women and Latinas in this field. In the U.S., about 79% of computer scientists are men, despite women earning 57% of all bachelor's degrees. This project explores the lack of representation of Women and Latinas and recommends how to attract them to computer science. I want to explore whether this phenomenon is cultural, personal, or due to a lack of awareness about technology's role in careers, as I once experienced. For this project, I created a survey for women and Latina STEM students at the College of Charleston to answer questions about transitioning from high school to college, moving out, and parental hesitation about college. Culture, gender, and lack of knowledge about the education system may be reasons parents hesitate. These factors can prevent women from exploring tech careers or learning about STEM fields beyond medicine, like engineering and computer science. In conclusion, this research aims to identify barriers preventing Latinas and women from pursuing computer science. By addressing cultural and personal challenges, we can create strategies to increase awareness and introduce more Latinas and women to this field.

67. The Pink and the Orange: Modelling Shifts in LGBTQ+ Sentiment in the 2024 Presidential Election
Student Presenter: Logan Martin*
Faculty Mentor(s): Navid Hashemi

The 2024 United States presidential election was anomalous for many reasons. Among these was an acute sense by many in the LGBTQ+ community that, responding to a shift in the cultural landscape, candidates from both parties adopted less queer-friendly strategies compared with campaigns in the past, particularly with respect to transgender people. However, up to this point, there has been little empirical, data-driven research of the rhetoric from the last political campaign in relation to previous elections, and even less regarding LGBTQ+ issues. Using data collected from debates, speeches, interviews, and social media posts from the past 20 years, I develop a time-series model using a recurrent neural network to determine whether, and the degree to which, the candidates' sentiment shifted on LGBTQ+ rights relative to past elections. This model, which is unique in its application of time-series analysis to rhetoric from political campaigns, can be used to evaluate the trend in candidate sentiment and make predictions for the next election. The techniques behind the model can also be easily applied to other issues, such as immigration and criminal justice reform. Lastly, this model can be expanded to include non-presidential candidates, primary elections, and countries other than the U.S.

68. DepLens: Automated Identification of Software Supply Chain Vulnerability
Student Presenter: Tyler McGuire
Faculty Mentor(s): Krishnendu Ghosh

This paper explores the critical role of software supply chain management in modern software development, emphasizing the risks associated with third-party dependencies. To address these challenges, we propose DepLens, a containerized Python tool designed to provide developers with powerful code visualization, vulnerability identification, and modification capabilities. Leveraging abstract syntax trees (ASTs) and compact abstract graphs, DepLens offers the capability to produce AST visualizations with a variety of node and edge styles, including color, shape, dashed, and solid lines. This functionality is utilized in conjunction with machine learning techniques to identify and visualize potentially vulnerable snippets of code, enhancing the accuracy and efficiency of vulnerability detection. DepLens's visualization capabilities provide actionable insights into dependency relationships and vulnerability hotspots, bridging the gap between theoretical analysis and practical application. This work aims to enhance the security and reliability of modern software ecosystems.

69. Adversarial Machine Learning Approaches in Prediction of Malware Families
Student Presenter: Dylan McTigue
Faculty Mentor(s): Kris Ghosh

Adversarial Machine Learning (AML) has become a significant area of research in cybersecurity, particularly in the detection and classification of malware families. This project explores how machine learning models can be manipulated by adversarial attacks, such as evasion and data poisoning, and how these attacks impact the prediction of malware families. Using Random Forest Classification, this project distinguishes between different malware families, including Trojans, Spyware, Worms, and Backdoors, by analyzing API call sequences from a published dataset. Beyond model training, this research also focuses into adversarial attacks on machine learning based malware classifiers. Studies were conducted in which models were trained to classify a specific malware family but were then exposed to adversarially manipulated data, also known as data poisoning, which significantly degraded their performance. Experiments are conducted and results are presented.

70. Using Machine Learning to Predict Temperature Trends in South Carolina Using Historical Climate Data ♻
Student Presenter: Angela Nganga*
Faculty Mentor(s): Navid Hashemi

Predicting temperature trends is crucial for a large number of sectors, including agricultural planning, ecological studies, and climate adaptation strategies. This project aims to apply machine learning techniques to predict temperature trends in South Carolina for 2024 using climate data from 2015 to 2023. The model is trained on a dataset of approximately 21,000 weather records from weather stations across South Carolina from NOAA's NCEI (National Centers for Environmental Information) website. This study examines nonlinear temperature patterns, accounting for significant monthly and seasonal variability to better understand climate fluctuations. Feature engineering involves extracting the month from the date column to analyze monthly trends and adding a year column to assess the impact of climate change on temperature patterns. Additionally, the data is aggregated seasonally to compare the accuracy of the seasonal and monthly predictions. This project is implemented in Jupyter Notebook, using Pandas and NumPy for data processing. The Matplotlib and Seaborn libraries are used for visualization, and Scikit-learn is used to implement machine learning models such as linear regression, decision tree regression, and random forest regression. By incorporating a wide range of supervised machine learning regression-based techniques, this approach provides insights into South Carolina's temperature trends for the year 2024 and the effectiveness of machine learning models in nonlinear climate prediction. Ultimately, this research enhances the understanding of regional climate dynamics and provides a robust framework for building resilience to future climatic shifts in South Carolina.

71. Data-Driven Prediction of Criminal Behavior Patterns in Charleston, South Carolina
Student Presenter: Owayne Owens*
Faculty Mentor(s): Navid Hashemi

Understanding repeat offenses is crucial for law enforcement, policymakers, and rehabilitation programs. This study leverages data-driven methods to analyze criminal behavior patterns in Charleston, SC, using arrest records

from 2015 to 2024. The dataset consists of approximately 28,000 records from the Charleston Police Department, capturing offender demographics, offense types, arrest timing, and other contextual attributes. To define reoffending, individuals with multiple arrests (based on unique identifiers) are classified accordingly. To enhance data quality, preprocessing techniques, such as median imputation for missing data will be used. Various machine learning models will be explored to identify the most effective approach for predicting repeat offenses. Model performance will be evaluated using standard classification metrics, and feature analysis will highlight key factors associated with reoffending. Beyond predictive accuracy, this research examines broader socio-economic and systemic influences on criminal behavior. Findings will be compared with existing studies to validate patterns and explore policy implications. Additionally, ethical considerations, such as bias in predictive modeling and fairness in algorithmic decision-making, will be addressed. By integrating data-driven insights with criminological perspectives, this study aims to inform evidence-based policies that enhance public safety while ensuring equitable treatment in the justice system.

72. AI Student Schedule Optimization using Microsoft Copilot
Student Presenter: Harrison Penley
Faculty Mentor(s): Lancie Affonso

All students at The College of Charleston have access to free use of Microsoft Copilot.with Enterpirse Data Protection. This project aims to demonstrate the effectiveness of AI-powered tools, particularly Microsoft Copilot, in assisting students with optimizing their schedules for classes, homework, and free time. The goal is to support students who struggle with time management by offering a personalized, AI-driven approach to calendar creation and task prioritization. The methodology involves training a Small Language Model (SLM) to generate customized schedules based on individual student preferences, including class timings, workload, personal commitments, and free time availability. The model will learn to balance academic obligations with free time, aiming to foster better productivity and well-being. By leveraging data from user input, the AI will propose realistic and manageable schedules to maximize students' time and reduce stress. The effectiveness of this AI-driven scheduling approach draws from similar applications in other fields, where tools like PowerBI and Querri have been successfully used to optimize workflow and decision-making. for example, language models have already demonstrated their utility in business environments by providing data-driven insights for process optimization and resource allocation. This project builds on these successful precedents to demonstrate how AI can be tailored to meet the needs of students, offering a scalable and adaptive solution to common time management challenges that are often faced in academia.

73. Hunger and Homelessness in Charleston: A Web-Based Simulation ♻
Student Presenter: Mohammad Komail Rezaee
Faculty Mentor(s): Lancie Affonso

This project presents an interactive, web-based simulation (www.simulation.awareandact.info) designed to educate and engage users on the pressing issues of hunger and homelessness in Charleston County. Developed in partnership with the Center for Civic Engagement, the simulation utilizes real data from local nonprofits and government organizations to create realistic scenarios that highlight the daily challenges faced by individuals experiencing poverty and housing instability. The simulation uses a combination of HTML, CSS, and JavaScript to create a responsive and user-friendly interface accessible across various devices. Leveraging modern web frameworks such as React.js for the front end ensures dynamic and seamless user interactions, while Node.js and Express.js handle the back-end operations efficiently. A MongoDB database stores and manages the local data, allowing for real-time updates and scalability. Additionally, the application incorporates secure APIs to fetch and update data from local organizations, ensuring that the information remains current and accurate. User interactions are tracked and anonymized using Firebase, providing valuable data points for future research on community perceptions and trends related to hunger and homelessness. Upon completing the simulation, users can receive information about volunteering opportunities within Charleston County. This feature bridges the gap between digital engagement and real-world impact, encouraging participants to contribute directly to local efforts addressing these critical issues. By transforming awareness into actionable steps, the simulation educates and empowers users to participate in meaningful community service.

74. PythonMusic – An Environment for Developing Algorithmic Art Projects
Student Presenter: Trevor Ritchie*
Faculty Mentor(s): Bill Manaris
Additional Authors: Taj Ballinger

PythonMusic is a Python-based software environment for developing algorithmic art projects. It facilitates the creation of interactive, algorithmic compositions, sound installations, and audiovisual experiences. It is based on JythonMusic, an earlier environment for the same purpose (see http://jythonmusic.org), and extends it to offer additional graphics rendering options, simplified installation, and freedom of software development editor (IDE) of choice. PythonMusic is built on top of PortAudio and Pyglet, two lower-level, widely available libraries, leveraging their optimizations to improve performance. PythonMusic provides composers and visual artists with libraries for music making, visual art, image manipulation, graphical user interfaces, and connecting to external devices, such as digital pianos, smartphones, and tablets. By transitioning from Jython and Java to Python, PythonMusic retains the accessibility and expressiveness of Python, improves execution speed, and offers broader compatibility with Python's growing selection of libraries. The environment is free and open source. This project is partially funded by the US National Science Foundation and the US National Endowment for the Arts.

75. Predicting College Basketball Program Revenue Based on Season Success with Machine Learning
Student Presenter: Jake Ritter*
Faculty Mentor(s): Navid Hashemi

College basketball programs generate significant revenue through ticket sales, media rights, merchandise, and donor contributions. Understanding how team performance influences financial outcomes can help universities better allocate resources and forecast future earnings. This project aims to develop a predictive model that estimates a program's revenue based on its on-court success. Using historical game statistics from Sports Reference and financial data from the NCAA, I will analyze key performance indicators such as win percentage, postseason appearances, national rankings, and home attendance. The data will be processed and merged to create a comprehensive data set linking team success to financial performance. I will apply machine learning techniques, beginning with simpler models such as regression before moving on to advanced models like XGBoost. Model performance will be evaluated using various statistical metrics to determine how well team performance explains revenue variations. This research provides valuable insights into the financial impact of athletic success, helping universities, athletic departments, and policymakers make informed budgetary and investment decisions. By quantifying the relationship between winning and revenue, this project contributes to the broader discussion on sports economics and collegiate athletics funding.

76. Smart Warehousing: Autonomous Inventory Management with Computer Vision ♻
Student Presenter: Camila Ruiz-Villela
Faculty Mentor(s): Mia Wang
Additional Authors: Saif Chaudhry, Sammy Eubank, Bhrett Boggs

Inventory management for warehouses historically has been done with manual labor and is a time-consuming process. However, every business needs to have inventory management to ensure they have enough inventory to meet the needs of their customers. Efficiency is key and this study attempts to improve the efficiency of inventory management by using drone or user uploaded videos. This project focuses on computer vision, user-interface, and machine-learning to detect the barcodes or QR codes from an uploaded video from the user. The plan for this project is that users, either manually or using drones, will take videos inside a warehouse of all inventory items and then be uploaded to a website with an interactive user interface. On the website, the video will be processed and in real time, identify the barcodes or QR codes of the warehouse item and will collect the data provided. Afterwards, the data will be autonomously updated within the inventory database, removing the need for manual data entry. Using drones allows for this process to be even faster, especially if the warehouse is very large and has rafters that are in areas that are manually hard to reach. This project will let businesses quickly and accurately process large amounts of data. Moreover, having a website where users can upload their video helps smaller businesses or

anybody that needs it. In summary, this project will reduce human error, labor, and improve time efficiency. In the future, this project could become a mobile application.

77. Can AI Enhance Student Study Strategies?
Student Presenter: Kristina Rydbom
Faculty Mentor(s): Lancie Affonso

As artificial intelligence becomes more common in higher education, understanding how to use it effectively and ethically is important for student success. This research explores the integration of Microsoft Copilot, a generative AI tool, into a first-year class at the College of Charleston. Through a series of workshops in a First-Year Experience (FYE) DATA 101 course, we examined how students can use AI tools like Copilot to support their learning while maintaining ethical standards. The hands-on workshops were combined with student surveys to assess the impact and effectiveness of AI usage and Copilot implementation. Workshops focused on fundamental AI literacy, prompt engineering techniques, and ethical considerations in AI usage. The surveys served to gather student feedback and measure learning outcomes. Research included extensive review of current literature on AI in education and analysis of Microsoft Copilot's capabilities across different applications. Early findings suggest that a structured introduction to AI tools, combined with emphasis on ethical usage and proper prompt engineering, can positively impact student study habits. This research contributes to the broader discussion on how academic institutions can responsibly integrate AI tools into their curriculum while preparing students for an increasingly AI-driven academic environment. The results provide useful guidelines for using AI in college courses and offer insights that could potentially help shape future policies at the College of Charleston.

78. Understanding and Visualizing Data Lakes: The Future of Data Storage and Management
Student Presenter: Simon Salazar-Marin
Faculty Mentor(s): Lancie Affonso

This project explores the concept of data lakes, focusing on their architecture, advantages, and applications in modern data management. Using Amazon Web Services (AWS) as the platform, the project involves the creation of a data lake to store, process, and analyze a sample dataset. The project's aim is to demonstrate how data lakes offer scalability and flexibility for managing diverse data types. The process began by generating a sample database in JSON format, followed by the creation of an AWS-based data lake using Lake Formation. Once the data lake was created, it was crawled using AWS Glue. With the data organized and readily accessible, Amazon Athena was used to run queries against the cataloged data, helping retrieve valuable insights from the dataset. To bring these insights to life, the project utilized Amazon QuickSight, a powerful visualization tool within the AWS ecosystem. Interactive bar charts and pie charts were created based on the country of origin in our sample employee dataset, making it easy to analyze trends and patterns in the data. By leveraging these tools, the project showcased how a complete data lake setup on AWS can streamline the process from raw data ingestion to generating actionable insights. This hands-on approach highlights how data lakes, especially when implemented on AWS, provide an efficient and cost-effective solution for modern big data analytics. The results demonstrate the power of data lakes to support systems across various industries by offering a flexible, scalable, and centralized platform for managing large and diverse data.

79. Machine Learning Insights into Family Health History and Personal Health Trends
Student Presenter: Wish Shao
Faculty Mentor(s): Navid Hashemi
Additional Authors: Sophia Kozlowski

Family health history is a crucial yet underutilized factor in personalized medicine. This study leverages data from the All of Us Research Program at the National Institutes of Health, analyzing survey responses, demographic details, and physical measurements from over 140,000 participants. Using machine learning, we identified associations between family health history and 118 health conditions, revealing important features, cross-condition predictive patterns, family health combinations. To enhance scalability, we transformed the static survey data into a structured tree-based format, allowing for more flexible and efficient data representation. Additionally,

our analysis examined age and sex distributions, providing deeper insights into hereditary and demographic influences on health. Despite challenges such as missing data and biases in survey design, the extensive dataset enabled the development of robust predictive models. These findings emphasize the need for improved data collection practices and increased public awareness, advancing personalized medicine and informing public health strategies.

80. Corner Store: A Critique of Capitalistic Values Through Environmental Narrative
Student Presenter: Zachary Sika
Faculty Mentor(s): Sarah Schoemann

Corner Store is a retro-stylized horror game capitalistic-critique with a focus on environmental storytelling and engagement that is being created by a team of people in Dr. Sarah Schoemann's game development research lab, CAT Lab (Critical Art and Technology Lab). The story takes place over the course of a week, with the player being given a list of items to pick up from the in-game corner store located within a large environment. As the story progresses and the player completes tasks, the environment changes through each day, with a concentration on both instilling active unease within the player by subtly changing gameplay mechanics and behavior of stylized 2D NPCs, and inactive storytelling through the changes present within the neighborhood the game takes place. Family-owned businesses close and are replaced with store chains, construction of new buildings take place within poverty-stricken areas of the game, and buildings become dilapidated over the course of the game as a commentary on gentrification and the wealth gap of lower middle class and upper middle class citizens.

81. UAV-Based Autonomous Navigation in Dynamic, GPS-Denied Indoor Spaces Using Sensor Fusion
Student Presenter: Quinn Simmonds
Faculty Mentor(s): Mia Wang

This research explores a multi-sensor fusion approach for reliable autonomous navigation of drones in GPS-denied indoor environments. The proposed system integrates sensor fusion with SLAM and dynamic path planning algorithms for localization, mapping and obstacle avoidance. The platform for this project is a HolyBro X500 V2 drone, a Pixhawk 6C flight controller and a Jetson Nano companion computer that will provide real-time decision making and adaptive navigation.
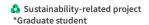
82. Dolly's World: A Queer VR Escape Room Game
Student Presenter: Drew Smuniewski*
Faculty Mentor(s): Sarah Schoemann
Additional Authors: Aranda, Dorian; Colclough, Holden; Goodman, Tyler; Grimoire, Ev; Jones, Cooper

Dolly's World is an escape-room-style VR game for the Oculus Quest developed by student researchers in the Critical Art and Technology Lab with Professor Sarah Schoemann. In Dolly's World players find themselves in the surreal environment of a fictional kids television show set inspired by the aesthetics of real life shows like Pee-Wee's Playhouse. While exploring Dolly's World players discover that they are a female recent grad named "Bee" in a queer relationship with their coworker, "Jess", at the fast casual pizza place, Krust Krafters, where they work. As players complete puzzles, they'll learn from Jess' about the complicated class dynamics of the relationship, the dubious state of workers' rights at Krust Krafters, and the conflict between Bee and Jess over suspicions of wage-theft by their manager. Despite strides towards more diverse representation in the past decade, games centering the experiences of queer characters remain outliers, and this lack of representation is particularly acute in VR titles. Simultaneously, as income inequality climbs in the 21st century, exacerbated by stressors like inflation, housing costs and decade of depressed overall wage gains, the service industry has seen efforts to organize worker power under movements such as the "Fight for $15". Through the story of Bee and Jess in Dolly's World we hope to add to the growing body of independent video games exploring themes of identity and class through a lens that is reflective of real world issues faced by workers today and representative of experiences that have been underexplored in games.

83. Creating a Mobile Application that Assists in the Education of Children with Dyslexia

Student Presenter: Aidan Stout
Faculty Mentor(s): RoxAnn Stalvey

This project aims to develop a gamified mobile application designed to assist children with dyslexia in their education. Given the rising costs of specialized educational support and the lack of accessible, tailored learning resources, this project seeks to provide an engaging, free alternative that empowers children to build essential skills. The app will incorporate research-based learning techniques into an interactive and enjoyable format, fostering a supportive environment for users. The development process includes multiple phases: research on effective teaching strategies, consultation with an occupational therapist, iterative design, and testing with intended users to refine functionality. The project will culminate in a working alpha version of the app and a comprehensive report detailing the research, app development process, and user feedback. The outcomes of this project will contribute to the growing field of educational technology by demonstrating the potential of gamification in addressing learning challenges. By providing an accessible tool for children with dyslexia, this work has the potential to improve educational outcomes and promote inclusive learning. Future applications may include expanding the app's features and adapting it for additional learning disabilities such as dyscalculia.

84. Improving Genre Labeling in the Million Song Dataset
Student Presenter: Jennifer White
Faculty Mentor(s): Mia Wang

Music classification is essential for music recommendation, search engines, and playlist generation. The Million Song Dataset (MSD) serves as a crucial resource for research in Music Information Retrieval (MIR), yet inconsistent genre labeling remains a major challenge. This study aims to enhance genre classification accuracy by combining machine learning techniques with hand-labeled data. A key issue in genre classification is the subjectivity of genre definitions and the evolving nature of music styles. Many existing approaches rely solely on automated classification, which struggles with ambiguous or overlapping genres. This research introduces a hybrid approach, leveraging human expertise to refine labels and improve model performance. A subset of 1,000 songs from the MSD will be hand-labeled and used to train classification models, including traditional methods like logistic regression and advanced architectures like Convolutional Neural Networks (CNNs). Feature extraction will incorporate Mel-Frequency Cepstral Coefficients (MFCCs), tempo, and lyrical content to enhance classification accuracy. By addressing labeling inconsistencies, this research seeks to improve the utility of the MSD for music recommendation systems and broader MIR applications. The anticipated findings suggest that incorporating human-labeled data will lead to more reliable genre classification, ultimately benefiting digital music organization and discovery. These improvements will contribute to more personalized and intuitive music experiences, demonstrating the potential of machine learning to refine large-scale music datasets.

85. Applying software engineering principles in financial derivatives analysis
Student Presenter: John Wilkes
Faculty Mentor(s): Lancie Affonso

We demonstrate the software development process for financial data visualization software, focusing on the creation of advanced options research tools. We provide a clear blueprint for individual developers seeking to build similarly complex financial software by documenting each step of the journey‚Äîfrom requirements gathering final prototype delivery. Our approach seeks to highlight how early decisions regarding data structure, visualization methods, and user flow can dramatically influence the quality and depth of insights retail investors can glean from the trading and research software they interact with. The rapid growth in retail options trading activity attributable to the advent of zero-days-to-expiration contracts has made the development of these tools urgent and accentuates the need for more intuitive, information-rich research environments that go beyond the traditional options chains that brokerage platforms provide. Modern research tools require dynamic visuals and real-time data to enhance users' ability to identify market patterns and manage risk effectively. Outlining both the technical and methodological steps taken during development encourages the industry-wide adoption of higher standards in data richness, transparency, and user-focused design surrounding the complex financial products retail investors increasingly express demand for. These examples lay the groundwork for future research on the behavioral

♻ **Sustainability-related project**
*Graduate student

implications of data visualization techniques on financial decision-making. Ultimately, our process demonstrates how individual developers can leverage structured, iterative development practices to deliver sophisticated analytics platforms that empower retail traders to navigate an increasingly complex market landscape with greater confidence and clarity.

Department of Engineering

86. Development of Cryopreservation for Intervertebral Discs in a Pig Model
Student Presenter: Emily Alfortish
Faculty Mentor(s): Qian Zhang
Additional Authors: Sydney Pearson, Sophia Browne, Savana Kate Schwanda

The goal of this project is to assess the feasibility of preserving human intervertebral discs (IVDs) for reimplantation using cryoprotective agent (CPA) solutions. There is a significant need for IVD transplants among patients with spinal injuries, but preservation challenges limit availability. A successful preservation system would greatly expand access to these critical transplants. Cryopreservation, which involves freezing tissues for long-term storage, requires CPA solutions to protect IVDs from damage caused by ice formation. However, CPA toxicity poses risks to tissue integrity. This study aims to identify the optimal CPA concentration that effectively preserves IVDs without causing harm. Using a micro-computed tomography (MicroCT) scanner, researchers measure the density of IVD samples to evaluate preservation outcomes. The study's first phase tests samples exposed to varying CPA concentrations, while the second phase examines the impact of different loading times and procedures. Preliminary results indicate that IVD density is proportional to CPA concentration. Additionally, a 30-minute loading time preserves structural integrity better than a 60-minute loading time. Future work will refine the optimal CPA concentration and examine unloading conditions. This research has significant medical implications. IVDs are challenging to preserve due to their complex structure and jelly-like interior, which are sensitive to damage during freezing. By developing effective preservation methods, this study could make IVD transplants more widely available, offering patients with spinal injuries a greater chance at full recovery.

87. Deep Learning for Crystallization Detection in Medical Fluids
Student Presenter: Lauren Bentley
Faculty Mentor(s): Qian Zhang

Crystallization presents a significant challenge in medical and pharmaceutical sciences, compromising the integrity of biological solutions, drug formulations, and cryopreserved tissues. In cryopreservation, crystallization can lead to tissue degradation, while in pharmaceuticals, it diminishes antibiotic efficacy and disrupts solution stability. Leveraging deep learning and computer vision for early detection of crystallization enhances solution quality, ensuring the stability and preservation of tissues and pharmaceuticals during storage and transportation. This study develops a binary convolutional neural network (CNN) model to detect and classify the initial formation of impurities in the crystallization process using data from OpenCrystalData's Crystallization Impurity Detection Dataset. The impurities analyzed include phenylglycine, which initiates crystal growth, and cephalexin, a form of crystallization primarily found in pharmaceutical applications. The current model achieved up to 99% accuracy on unseen data, effectively distinguishing between these impurity classes with minimal misclassifications. Additionally, it demonstrated high precision and recall, reinforcing the reliability and consistency of impurity classification. The insights gained from this study are valuable for various medical fields, including cryopreservation, where crystallization can impact solution viability. Future work will focus on expanding the dataset to enhance model generalization in real-world applications by developing a multi-class model capable of more robustly tracking the various phases of the crystallization process, improving early detection and impurity classification. Additionally, this study aims to standardize parameters for newly collected data, facilitating further research on crystallization in cryopreservation, where available data remains limited. These efforts will contribute to more reliable impurity detection, ultimately improving solution stability in medical applications.

88. Melo: A Stressing Monitoring App ♻
Student Presenter: Julianne Macanas
Faculty Mentor(s): Qian Zhang

During a transitional age, young adults are typically prone to stress. Meelo, the chameleon, can help! Meelo will be on the AI-driven app called Melo, where you can monitor your stress levels, blood pressure, journal moods, sleeping and eating habits, and list activities from your day. Meelo can reflect your exact mood, try to appease, and hopefully uplift it with breathing exercises and calming music. Available on iOS, Android, and cross-platform, Melo can be available with a blood pressure bracelet monitor, for easier tracking with Melo specific technologies.

89. Leveraging Quantum Computing for Network Endpoint Encryption and Modeling Using SysML
Student Presenter: Sydney Pearson
Faculty Mentor(s): Olufunke Oladimeji
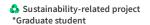**Additional Authors: Savana Kate Schwanda**

Quantum computing is commonly described as a type of computation that uses the principles of quantum mechanics to process information. Specifically, quantum computers can handle complexity efficiently using superposition and enhanced problem-solving capabilities as a result of its utilization of the quantum bit instead of the bit used in classical computing. In the age of digital manipulation, the capabilities of quantum computers have allowed for a more holistic understanding of quantum computer's ability to bring about solutions to cybersecurity, banking and finance, and advanced manufacturing systems. Some of the most prevalent challenges to develop quantum algorithms include benchmarking and error mitigation techniques necessary for software development and hardware implementation and interfacing. To address these shortcoming, Model-Based Systems Engineering (MBSE) is being proposed to develop a framework through a formalized application of modeling to support system requirements and traceability and create models to support system behavior and how quantum machines will interact with the software and hardware to increase stakeholder understanding. Other MBSE techniques like recursive validation and verification throughout the project lifecycle ensure that quantum-based projects reach the highest level of development. This research will use a systematic literature review methodology for evidence-informed research through a bibliometric analysis. Therefore, the aim of this literature review is to identify past or current trends in existing research that applies MBSE methods to quantum computing. This paper will identify where MBSE has been used to add value in quantum computing and set priorities for future work.

90. Pensievision CervImage User Journey Map
Student Presenter: Jade Shellenberger
Faculty Mentor(s): Qian Zhang

This capstone project focuses on the development of a user journey map for PensieVision's CervImage device, a portable, affordable, AI-powered tool designed to improve early cervical cancer detection. The user journey map tracks the activities, processes, and interactions of various stakeholders - healthcare providers, patients, and technical teams - throughout the device's clinical trials and real-world deployment. The primary goal is to provide PensieVision's management and technical teams with valuable insights that will help refine the product, optimize workflows, and improve user experience. Cervical cancer remains a significant global health issue, particularly in underserved regions where access to traditional screening methods is limited. CervImage addresses this challenge by using advanced 3D imaging and AI technology to produce high-resolution images with a single-lens system, making it both cost-effective and easy to use in low-resource settings. Additionally, the device offers telemedicine capabilities, allowing remote analysis of images via low-bandwidth connections. This project aims to track stakeholder interactions, refine the device's design, and optimize its integration into healthcare settings, ultimately improving clinical outcomes and patient experiences. The insights from the user journey map will help PensieVision scale the device's deployment, extend healthcare access, and save lives by improving cervical cancer screening worldwide.

91. Predicting Cardiac Irregularities Using ECG Detecting Technology
Student Presenter: Jeffrey Werth

♻ Sustainability-related project
*Graduate student

Faculty Mentor(s): Antonio Ruotolo
Additional Authors: Nurbek Maksutov, Ohaji Clark, Qian Zhang

ECG devices play a crucial role in monitoring and diagnosing cardiac conditions by measuring the heart's electrical activity. An ECG consists of several parts, each representing different phases of the heart's electrical activity. These phases fluctuate based on the individual's physical state, and abnormalities can be detected within the ECG by analyzing these components. This capstone project focuses on developing a device that can read an ECG and detect irregularities to enhance safety, particularly in environments where cardiac issues could be critical, such as when operating machinery. The ECG can be broken down into three segments: the P wave, QRS complex, and T wave. The P wave represents atrial depolarization, during which the heart fills with blood. The absence of the P wave may indicate Atrial Fibrillation, causing irregular and rapid heartbeats. The QRS complex represents ventricular depolarization, consisting of a small Q wave, a high R wave, and a small S wave. This segment helps predict conditions like fibrillation and arrhythmias, which could lead to stroke or blood clots. The T wave represents ventricular repolarization and can be linked to ischemia, where insufficient blood supply causes oxygen shortages in organs. A heart rate over 100 beats per minute at rest may indicate Tachyarrhythmia. Using Arduino technology, we collected data to analyze patterns and predict cardiac irregularities early, aiming to prevent more severe health issues.

Department of Mathematics

92. Embedding equitable (s,p)-edge-colorings of K_n
Student Presenter: Mika Olufemi
Faculty Mentor(s): Stacie Baumann
Additional Authors: Stafford Yerger

An (s, p)-edge-coloring of a graph G is a coloring of the edges of G with s colors such that p colors appear at each vertex. In order to generalize the notion of proper edge-coloring, such colorings are defined to be equitable: the number of edges of each color appearing at a vertex are fairly distributed. We find the necessary and sufficient conditions to embed an equitable (s_1, p_1)-edge-coloring of K_{n_1} into an equitable (s_2, p_2)-edge-coloring of K_{n_2}. We focus on a set of values that cannot be solved by the traditional technique of switching colors along an alternating path. We use the proof technique of amalgamations by amalgamating vertices that are missing the same color, coloring the amalgamation graph, then detaching the graph to obtain the desired coloring.

93. A Novel, Interpretable Machine Learning Method for Symbolic Regression ♻
Student Presenter: Aidan Riordan
Faculty Mentor(s): Garrett Mitchener
Additional Authors: Latherial Calbert

Machine learning methods that can discover interpretable mathematical models from data are increasingly valuable across sciences. This work presents Jessamine, a novel symbolic regression (SR) algorithm that combines evolutionary computation with parameter optimization to discover governing equations from observed data. Jessamine employs a unique genome representation that encodes mathematical expressions as sequences of operations on state variables. The algorithm uses ridge regression for parameter optimization and implements a selection-mutation process that evolves a population of candidate expressions toward better predictions. The evolutionary process includes specialized mutation and recombination operators designed to preserve meaningful mathematical structure. We evaluate Jessamine's performance on the recently introduced EmpiricalBench dataset, which contains historical examples of empirically discovered scientific laws, including Kepler's Third Law, Newton's Law of Universal Gravitation, and Planck's Law. In benchmarking against six state-of-the-art SR methods, Jessamine demonstrates competitive performance in recovering the true underlying equations. The algorithm

successfully reconstructs complex dynamical systems, as demonstrated on the two-dimensional Brusselator system, recovering the exact partial differential equations from trajectory data. This work advances the field of automated scientific discovery by providing a robust method for extracting interpretable mathematical models from data. The results suggest Jessamine can help accelerate the discovery of natural laws in scientific domains where governing equations remain unknown.

94. From Reluctance to Resilience: Transforming Mindsets Through Innovative Teaching in Business Calculus
Student Presenter: Olivia Valente
Faculty Mentor(s): Kathryn Pedings-Behling

Many students enter Business Calculus with anxiety and a belief that they are not "math people," often expressing concerns about their ability to succeed. As a teaching assistant for this course, I have had the opportunity to support these students through grading their activities, calculations, group projects, and exams, as well as offering office hours every week, both in-person and virtually. A key aspect of my experience has been observing how students interact with the Deconstruct Business Calculus curriculum, which integrates active learning techniques and digital tools to create an engaging learning experience. This approach has provided unique insights into how different modalities - online asynchronous learning versus in-person instruction - impact student engagement, confidence, and performance. Throughout my two semesters in this position, I have noted a gradual shift in many students' mathematical mindsets. As they engage with the curriculum and seek support, their initial reluctance often transforms into a more confident approach to problem-solving and a more positive attitude toward mathematics. My observations highlight the importance of accessible academic support and innovative course design in fostering a positive relationship with mathematics. This poster will showcase findings on student experiences, the most effective support types, and how instructional methods influence students' attitudes and performance in Business Calculus.

SCHOOL OF HEALTH SCIENCES

Department of Health and Human Performance

95. Combined Oral Contraceptives and Inflammatory Markers of Reproductive Health
Student Presenter: KyLee Bales
Faculty Mentor(s): Arjun Ramani
Additional Authors: Abby Mosher, Alexa Schoettelkotte

 This study investigates the effects of combined estrogen-progestin oral contraceptives (COC) on immune markers across the menstrual cycle and examines how the inclusion of synthetic hormones in contraceptive use influences immune marker pulsatility. Combined oral contraceptives suppress ovulation by inhibiting follicular stimulating hormone (FSH) and luteinizing hormone (LH) release through negative feedback at the hypothalamic-pituitary level. These hormonal changes impact the immune system, which seems to facilitate menstrual and reproductive health, through fluctuations in pro-inflammatory cytokine concentrations of interleukin 6 (IL-6), c-reactive protein (CRP), interleukin 1-beta (IL-1β), tumor necrosis factor alpha (TNF-α), and interferon gamma (IFN-γ). Conversely, dysfunctional immune responses can negatively affect hormone regulation. In this study, menstrual symptom severity and peripheral pro-inflammatory cytokine concentrations will be assessed using ELISA (enzyme-linked immunosorbent assay), with fasted blood samples collected during four different phases of the menstrual cycle: the first day of menses, the mid-follicular phase (days 7-11), the ovulatory phase (day 14), and the mid-luteal phase (days 21-23). Participants will be grouped according to contraceptive use: no contraceptive use (CTRL) and oral contraceptive use (ORCO). We propose that those using COCs will have higher resting levels of pro-inflammatory cytokines. This research aims to clarify the effects of hormonal contraceptives on immune regulation and may offer insights into how contraceptive methods influence broader immune function and reproductive health. Given the widespread use of COCs, further understanding their impact on immune function could address concerns about fertility issues, immune health, and the increasing prevalence of menstrual-related issues.

96. A Customer Discovery Study on the Development and Implementation of PranaScience: A Breathwork App for Individuals Affected by Breast Cancer - A Qualitative Analysis ♻
Student Presenter: Francis Boscia
Faculty Mentor(s): Kasey Jordan

Background: With approximately 300,000 patients being diagnosed with breast cancer each year, an affordable, accessible, and effective intervention becomes a necessary implementation for the benefit of those affected. Patients experiencing breast cancer primarily report heightened fear, anxiety, depression, fatigue, and feelings of lost control. A potential treatment option that this analysis focuses on is pranayama breathing, a technique commonly practiced in yoga practices to combat the negative mental and physical burdens of breast cancer. Objective: This study aims to investigate the implementation of the pranayama breathing technique for cancer patients and to better understand patient needs, concerns, and potential barriers to the development and acceptance of a guided breathwork app (ParanaScience). Methods: During this research, 100 participants were asked to practice pranayama, a common yogic breathing practice, for 8 weeks using the PranaScience app to guide them. Structured interview questions were asked of each patient to uncover perceived benefits, possible challenges, and financial concerns of yogic breathing as a supplemental treatment for individuals affected by breast cancer. Data collected from participant interviews were analyzed using rapid qualitative analysis techniques. Results: The qualitative analysis has yet to be fully concluded, but a thematic summary of each interview will be compiled and presented to show each participant's input and feedback on the PranaScience app. Conclusion: Results are expected to inform the development of future breast cancer interventions.

97. Women's Experience with Endometriosis from Symptoms to Treatment: a Qualitative Study
Student Presenter: Cassidy Brooks

Faculty Mentor(s): Beth Sundstrom

Endometriosis is a condition characterized by endometrial-like tissue growing outside of the uterus, which can cause myriad symptoms. Individuals with endometriosis commonly experience heavy bleeding and severe pain during menstruation, though other symptoms include painful urination or bowel movements, irregular menstruation or spotting, and sometimes infertility. Though it's currently thought that endometriosis only affects a small portion of the menstruating population, diagnoses are rising due to increased awareness. However, the time from symptom presentation to diagnosis is still of considerable length. Deeper understanding regarding this experience is crucial to increase the awareness and timely diagnosis of endometriosis to prevent irreversible complications. The aim of the current study was to analyze narratives of how women experience endometriosis, from symptoms to diagnosis to treatment. A national web-based survey recruited people who menstruate (or who have menstruated), 18 years or older, in the United States. 150 participants completed qualitative open-ended narrative response questions about endometriosis. Qualitative data analysis software NVivo version 1.61 was used to analyze and code surveys. Content analysis revealed a dichotomy between being acknowledged and listened to, or being misdiagnosed and disregarded. The findings contribute to our understanding of a widely ignored and misdiagnosed disease and fill in the gaps in patients' experiences getting the necessary care for endometriosis, which often interferes with daily life. The results could provide practical recommendations to those within the public health and healthcare sector to improve awareness of endometriosis and its symptoms, in order to shed light on improvements for early intervention and care.

98. "Because I crave it": A qualitative analysis of attitudes toward e-cigarette use and campus-based cessation services among college students that vape
Student Presenter: Abby Crawford
Faculty Mentor(s): Christy Kollath-Cattano
Additional Authors: Camryn Dunlap

Background: Research on vaping cessation among college students is growing, but little is known about their quitting methods and interest in cessation services. Most qualitative studies focus on e-cigarette perceptions and reasons for use rather than quitting experiences. This study explores motivations for quitting, quit attempts, and recommendations for campus-based vaping cessation services. Methods: In-depth interviews were conducted in summer/fall 2024 with 18 college students from a public university in the Southeast who reported past 30-day e-cigarette use in a spring 2024 student health survey. Interviews were coded using an inductive approach. Results: The sample was predominantly female (n=14), with four identifying as non-binary/other. Half (n=9) also reported recent cigarette use. Most participants disliked vaping and discouraged friends from starting. Health concerns, particularly regarding lung function, were common, though many noted a lack of long-term research on e-cigarettes. While many wanted to quit, skepticism arose due to past failed attempts and addiction challenges. Most who attempted to quit used the "cold turkey" method, with some trying nicotine replacement therapy. Students were interested in campus cessation services, especially counseling and FDA-approved cessation products, but opposed mandatory educational programs. Conclusions: This study provides an in-depth look at the challenges college students face with vaping cessation. Findings suggest universities should offer targeted, opt-in cessation support rather than mandatory programming to better assist students in quitting.

99. Using Raman Spectroscopy to Study Environmental Microplastic Contamination ♻
Student Presenter: Mackenzie Eccles
Faculty Mentor(s): Leslie Hart
Additional Authors: Savannah Case (1), Miranda Dziobak (1, 2), Millie Knowles (1), Estella Martin(1), Eric Conger (3), Tita Curtin (1), Ayushi Gaur (3), Randall S. Wells (4), Elizabeth Berens McCabe (4), Robyn Faulkner Allen (4), Christina Toms (4, 5)

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The world's oceans contain an estimated 171 trillion microplastic particles (fragments smaller than 5mm). Because of this widespread contamination, microplastics have been detected in many marine organisms, including species that are part of the human diet, raising concerns about their potential impacts on both marine ecosystems and human health. Raman spectroscopy is an increasingly valuable tool for microplastic identification, capable of detecting particles equal to or less than 1 micron, regardless of their color or texture. This technique utilizes a powerful laser to interact with a sample, scattering light to reveal its chemical composition. It is particularly effective for identifying microplastics based on their unique spectral fingerprints. Here, we provide recommendations for applying Raman spectroscopy to microplastic detection across multiple sample types, including gastric (n=23) and fecal (n=15) samples from bottlenose dolphins (Tursiops truncatus), as well as muscle and gastrointestinal samples from two fish species: Gulf toadfish (Opsanus beta; n=30) and pinfish (Lagodon rhomboides; n=35). Raman spectroscopy is highly effective for identifying microplastics within these samples, as it rapidly produces detailed chemical maps without damaging the sample, allowing for accurate analysis. Improving the accuracy and precision of microplastic detection is essential for reliably assessing the extent of marine plastic contamination. Additionally, Raman spectroscopy enhances source tracking, refines risk assessment, and informs targeted mitigation strategies to combat plastic pollution.

100. "It's all in your head:" A mixed methods analysis of period trauma
Student Presenter: Maggie Harkins
Faculty Mentor(s): Beth Sundstrom

Period trauma, a term coined by Dr. Charis Chambers, is defined as "any sustained psychological, social, or emotional injury/distress related to or caused by menstruation." This novel term is largely absent from women's health literature. Period trauma can manifest in a multitude of ways including heavy menstrual bleeding, period pain, missed school/work, period poverty, and social stigma. All of these have the potential to profoundly impact the physical, mental, and emotional health of menstruators. This study aimed to explore the diverse ways menstruators experience period trauma and how period trauma can impact women. It also argues for the inclusion of period trauma in women's health literature. Researchers analyzed quantitative data from 1003 participants who completed an online survey about menstruation and period trauma. 26% of participants reported having experienced period trauma and 27% reported facing stigma or being told that they couldn't do something because of their period. 234 participants also completed open-ended narrative responses telling the story of their period trauma. Qualitative data displayed overarching themes related to menstruators associating their periods with pain, stress, and embarrassment, as well as feeling like they cannot discuss periods with friends, family, or sometimes even healthcare providers. These findings demonstrate a need for increased awareness and recognition of period trauma within both medical and social contexts. The results of this study highlight the importance of integrating period trauma into women's health literature and advocating for comprehensive menstrual education, improved healthcare access, and policies that address period stigma and poverty.

101. Internship with the MUSC Hollings Cancer Center Office of Community Outreach and Engagement's South Carolina Prostate Cancer Screening Program for African American Men (SC AMEN Program) ♻
Student Presenter: Mia Hilton
Faculty Mentor(s): Becky Kyryliuk
Additional Authors: Marvella Ford, Hazel Breland, Melanie Slan, and Kenneth Swaringer: Medical University of South Carolina's Office of Community Outreach and Engagement

Since the fall of 2024, I have interned with the Office of Community Outreach and Engagement (COE) at MUSC, whose focus is reducing the cancer burden in South Carolina through a multifaceted approach. The COE's SC AMEN program aims to reduce prostate cancer disparities in SC by increasing prostate cancer education and screening uptake. This program targets African American males between the ages of 40-69 as they are a high risk demographic in developing prostate cancer. SC AMEN utilizes three aims: education, navigation, and follow-up. The

education aim involves prostate cancer education sessions in which pre- and post-session surveys are completed. Participants are monitored for three months following the education session, in which a patient navigator with the SC AMEN program assists participants in obtaining a prostate cancer screening or identifying additional resources such as a primary care provider, insurance coverage, and/or transportation. The follow-up portion involves a final survey completed by the participant to assess sustained knowledge. Survey data is currently being analyzed to be implemented in a seminal research paper on the SC AMEN program. The overall objective of my internship experience with the COE has been to learn about the complexities of developing successful cancer interventions that address community needs and be involved in executing the visions of these programs through entering survey responses, assisting with research, preparing program resources, or verbalizing these actions through the manuscript writing process.

102. Predicting Risk of Femur Fracture in Collegiate Female Long-distance Runners
Student Presenter: Noah Hutchison
Faculty Mentor(s): Sarah Porto

The female athlete triad is an interrelationship between menstrual dysfunction, low energy availability, and low bone mineral density (BMD). The prevalence of any one of the conditions impacts 16-60% of athletic young women. Stress on the bone matrix increases BMD, yet some young long-distance female runners experience low BMD, increasing their risk of fracture and osteoporosis. The aim of the study is to investigate a predictive model of BMD. We hypothesize that there is a relationship between BMD, anthropometric measures, lifestyle activities, and blood markers. Fifteen female long-distance runners (age 20.5±3.9years, height 163.6±4.5cm, weight 56.9±5.9kg) completed medical history, eating behaviors, and exercise questionnaires alongside the collection of physiological measures utilizing dual-energy x-ray absorptiometry (DEXA), ultrasound scans, and a blood draw over one study visit. Visual analysis of anterior tibial ultrasounds showed no signs of stress fracture. Anthropometric data was correlated to BMD (1.2±0.1g/cm2) determining significant linear relationships between age (r=0.339, p=0.0283), weight (r=0.360, p=0.023), height (r=0.444, p=0.009), lean body mass (42.3±3.6kg; r=0.607, p=0.001), and bone mass (2.45±0.26kg; r=0.804, p<0.001). In multivariate analysis (r=0.896, p<0.001), a significant relationship was found between BMD and weight (r=-0.502, p=0.048), and bone mass (r=0.863, p=0.017), respectively. Markers of bone formation and turnover will provide valuable insight into predicting bone health and the ability to adapt to stress. DEXA measurement is a useful tool for monitoring BMD, and a predictive model may be effective in identifying risk factors for low BMD and early onset of osteoporosis in female collegiate athletes.

103. Analysis of Machine Learning Models in Predicting Physical Activity Guideline Adherence
Student Presenter: Joshua Keifer
Faculty Mentor(s): John Sieverdes

Health bioinformatics and the utility of machine learning and AI is accelerating in the past few years. Utilizing such models may provide new insights in patterns that may not be evident in traditional biostatistics, particularly with large health datasets. The purpose of this study was to utilize machine learning and AI analytical tools to on the U.S. National Health and Nutritional Examination Survey (NHANES) to explore health and demographic variables on physical activity categorizations (i.e., meeting the U.S. guidelines for physical activity or not). Using Python, data from the NHANES August 2021 to August 2023 survey was combined for the analysis. Data was cleaned and used to train 5 different machine learning models: Bernoulli Naïve Bayes, Support Vector Machines, Random Forest Classifier, Multilayer Perceptron, and the Cat Boost model. Each model was assessed via accuracy and F1 score and was compared against the other models to determine the best model. The random forest classifier had the best performance (F1 = 80.812%; Accuracy = 78.636%), while Bernoulli Naïve Bayes was the worst performing model (F1 = 72.498%; Accuracy = 69.635%). However, the hidden layers of the models do not allow us to see which variables were most significant in determining physical activity adherence. Overall, NHANES data was proven to be accurate for most of the training models for prediction of adherence to physical activity guidelines. In future research, other national datasets could be examined or combined with NHANES to provide more accurate estimates of adhering to physical activity guidelines.

104. Chemical Contaminants in a Coastal Food Web: Wildlife and Human Exposure Implications ♻

Student Presenter: Millie Knowles
Faculty Mentor(s): Leslie Hart
Additional Authors: Miranda Dziobak (1, 2), Randall S. Wells (3), Elizabeth Berens McCabe (3), Savannah Case (1), Eric Conger (4), Tita Curtin (1), Ayushi Gaur (4), Estella Martin (1)

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Phthalates are synthetic chemicals that have become ubiquitous in the environment due to their widespread use in household and commercial products. In our studies of long-term resident bottlenose dolphins (Tursiops truncatus) inhabiting Sarasota Bay FL (2010-2024), approximately 75% of sampled individuals (n=71) had detectable phthalate metabolites, with some concentrations exceeding levels measured in humans. While the source of contamination remains uncertain, prey fish may serve as an exposure vector. This study aims to assess the trophic risk of phthalate exposure by quantifying metabolites in two key prey species (Pinfish, Lagodon rhomboides, n=35; Gulf Toadfish, Opsanus beta, n=30) collected from Sarasota Bay (2022-2024). We will present concentrations of phthalate metabolites measured in two tissue types, metabolic organs (composite of liver, gills, and kidney) and muscle, using solid-phase extraction and liquid chromatography-tandem mass spectrometry. We will report the proportion of sampled fish with detectable metabolite concentrations (> limit of detection) and compare concentrations between tissue types and species. Additionally, metabolite profiles for each fish species will be examined in relation to those detected in dolphins. This study helps clarify whether trophic transfer is a potential route of exposure for bottlenose dolphins and humans, given that these fish are indirectly (as baitfish) and directly consumed as seafood. Considering the endocrine-disrupting properties of phthalates and their risks to cardiovascular and neurological health, this research contributes to environmental risk assessments and public health communication strategies by exploring the broader implications of phthalate contamination in marine and coastal ecosystems.

105. Physical Activity and Wellness in College Students
Student Presenter: Mary Lawrence
Faculty Mentor(s): Karen Smail
Additional Authors: Nick Leahy

Meeting the physical activity guidelines is essential for maintaining a healthy lifestyle. These guidelines recommend engaging in 150 minutes of moderate activity or 75 minutes of vigorous activity each week, along with at least two days of muscular strength training. As students transition from high school to college, they gain greater autonomy over their daily lives, and their choices can significantly impact their long-term health. College students often face a risk of reduced physical activity levels due to sedentary lifestyle choices. This project employs quantitative and qualitative methods to explore college students' physical activity and sleep patterns. The research aims to identify potential associations between physical activity levels and habits before college and current behaviors. Participants will complete a demographic survey to gather background information, including their geographical origin, physical activity levels in high school, and their self-perceived current levels of physical activity, rated on a scale from sedentary to very active. Additionally, the International Physical Activity Questionnaire (IPAQ) will be used. A total of 25 students enrolled in Physical Activity and Lifetime Movement (PALM) courses at the College of Charleston (CofC) volunteered for this study. After obtaining consent, the participants wore accelerometers for one week. These devices recorded their steps, heart rates, sleep patterns, and the intensity of their physical activity levels. The study is currently in the data collection and analysis phase. The results will enhance our understanding of physical activity and wellness among college students and will explore how geographical regions and backgrounds influence activity levels.

106. Female Reproductive Health and Physical Activity Status
Student Presenter: Abigail Mosher
Faculty Mentor(s): Arjun Ramani

Additional Authors: Alexa Schoettelkotte, KyLee Bales

Objective: To understand the relationship between female reproductive health and systemic inflammation by analyzing luteinizing hormone (LH) and follicle-stimulating hormone (FSH) pulsatility, menstrual symptom severity, and inflammatory cytokine levels throughout one menstrual cycle. These variables were additionally analyzed according to the participants' physical activity status and contraceptive use. Engaging in physical activity can decrease systemic inflammation, which may counter menstrual symptoms associated with localized inflammation. The use of combined oral contraceptives manipulates traditional female hormone pathways; therefore, this study additionally aims to identify differences in LH and FSH pulsatility and inflammatory cytokine levels according to the use of contraceptives. Methods: The conducted research examined how activity levels in those not using contraceptives (CTRL) versus those using the combined oral contraceptive pill (ORCO) correlate with inflammatory markers, including interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-a), interferon-gamma (IFN-y), C-reactive protein (CRP), and interleukin-1Beta (IL-1B). Peripheral concentrations of inflammatory markers were analyzed via enzyme-linked immunosorbent assay (ELISA) and differences between groups were analyzed using a repeated measures ANOVA model. Results: expected: > inflammation associated w/ < PA associated with < normal menstrual health. Discussion: expected: Irregular hormone pulsatility is associated with high levels of inflammatory cytokine expression. Physical activity promotes a systemic anti-inflammatory state, thereby regulating hormone pulsatility. The use of hormonal contraceptives counters this process by increasing the expression of pro-inflammatory cytokines. Those who use hormonal contraception can modulate hormone and inflammatory cytokine levels by regularly engaging in physical activity.

107. Experiences, Facilitators, and Barriers of Women in Academia Returning to Work after Childbirth ♻️
Student Presenter: Maya Pai
Faculty Mentor(s): John Sieverdes
Additional Authors: Katie Trejo Tello and Rochelle Altman

Background: Meaningful employment provides numerous benefits for women; however, returning to work following childbirth can present additional burdens and stressors during the postpartum period. This experience can negatively impact women's mental and physical health, relationship and work satisfaction, and career trajectories. Much of the research on this transition focuses on factors such as pumping support at work. However, more information on factors like wellbeing and work satisfaction specific to this transition is lacking, particularly for women in academia. Purpose: The purpose of this study was to better understand the experiences of women in academia transitioning back to work following childbirth and explore supportive and unsupportive factors during this transition. Methods: Faculty members at five universities in South Carolina who had given birth within the past ten years were recruited for participation in this qualitative study in fall 2024. Participants completed a demographic survey and a semi-structured in-depth interview about their resources, experiences, and challenges returning to work. Data were analyzed using an inductive approach framed by grounded theory.
Results: 10 participants completed the study. Five themes and 11 subthemes emerged. Themes included: (1) childcare issues, (2) impact on health, (3) burn out, (4) complex workplace culture, and (5) ambiguous return to work policies. Discussion: These results provide a more comprehensive understanding of women's experiences returning back to work in academia and can serve to guide recommendations at the university policy level that may better support those returning following childbirth.

108. A qualitative exploration of emergency preparedness resilience training motivation amongst college students
Student Presenter: Shiv Patel
Faculty Mentor(s): Kasey Jordan

Background: The Medical Reserve Corps (MRC) is a network of volunteers who help improve the health and safety of their communities. The MRC is mobilized to assist communities during times of disaster, public health emergencies, and other crises. Objective: The purpose of this research is to describe the motivating factors that influenced individuals to apply to an MRC training program. Methods: This project will be a secondary data analysis. This project includes data from applications to a workforce development training program offered in the Lowcountry region of South Carolina. The researchers will utilize thematic analysis to provide a description of

applicant rationales for participation. Inductive and deductive reasoning will be used to categorize, code, and ultimately develop comprehensive themes. Results: The analysis has yet to be completed. Results are expected to include a thematic description of motivating factors. Conclusion: Results can be used to inform future emergency preparedness and MRC recruitment efforts, promoting a larger team of volunteers to help protect community health.

109. Amyloid Effect on the Integrity and Structure of Ligamentum Flavum in the Spine
Student Presenter: Penelope Perkins
Faculty Mentor(s): Sarah Porto
Additional Authors: Christine Kern, PhD (Medical University of South Carolina), Yongren Wu, PhD (Clemson University), Guilherme Porto, MD (Roper St. Francis)

Spinal spondylosis, including ligamentum flavum (LF) hypertrophy, is a prominent health and economic issue in the U.S. due to its impact on well-being and work productivity. LF hypertrophy leads to a reduced spinal canal size, or stenosis, which often necessitates surgical treatment. Previous literature suggests a link between wild-type transthyretin amyloidosis in the LF and LF hypertrophy. The objective was to determine the relationship between LF hypertrophy and transthyretin amyloidosis. It was hypothesized that the hypertrophic changes mediated by wild-type transthyretin amyloidosis affect the extracellular matrix structural integrity of the LF. Surgical specimens [n=3 (2M/1F); age=69±6 years] and fresh-frozen human cadaveric spines [n=4 (2M/2F); age=63±24 years] were collected. LF samples were examined for transthyretin amyloid deposition using histology and immunohistochemistry (IHC) techniques. MRI data were reconstructed to quantify LF thickness using Amira 3D image analysis software, revealing a significant increase in LF thickness in diagnosed surgical samples (1.7±0.5 mm) compared to undiagnosed cadaver specimens (0.7±0.2 mm; p<0.001). Brightfield microscopy of Congo Red-stained tissue demonstrated orange-red amyloid deposits within the extracellular makeup of the surgical LF tissue, with amyloid deposition visible as green birefringence under a polarized microscope. IHC probes (i.e., anti-prealbumin, anti-amyloid P/SAP) revealed fluorescent staining patterns consistent with Congo Red results. These data support that transthyretin amyloidosis may correlate with LF hypertrophy and provide foundational knowledge for the future development of treatment and prevention of spinal stenosis.

110. Normative Workload Data Across Three Consecutive Competitive Seasons In Collegiate Men's Soccer Team
Student Presenter: Ava Rich
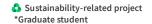**Faculty Mentor(s): Dr. Kate Pfile**

Workload encompasses the physical and mental stressors that an athlete endures. External workload is the physical work performed during training. Commonly, analyzed external workloads in soccer include sprint distance, total distance, player load, and power plays. Normative data establishes a baseline of what athletes are achieving. These data enable professionals to categorize training as normal and abnormal. Looking at external workloads, we can compare the normative data with an individual's or team's average to see if they are within the normal range. The purpose is to establish normative data for GPS-derived external workload measures in NCAA Division I male soccer players during the competitive season (August-October). Global positioning system (GPS) devices, Catapult, captured external workload variables. Data were collected over three consecutive competitive seasons (2022-2024), including all team-sanctioned practices and games. Data collection is complete, and statistical analyses to report descriptive statistics are underway. Our results will include measures of central tendency and variation for each external workload. We hypothesize there will be consistent results between seasons. This study provides a comprehensive picture of performance and external workload demand of an NCAA men's soccer athlete, enabling coaches, exercise and sport scientists to compare against an established baseline and make real-time adjustments.

111. Physical Activity and Female Reproductive Health
Student Presenter: Alexa Schoettelkotte
Faculty Mentor(s): Arjun Ramani
Additional Authors: KyLee Bales and Abby Mosher

Combined hormonal contraceptive pills (COC) are often one of the first recommendations for women experiencing menstrual dysfunction, which can often be perpetuated by chronic inflammation. Physical activity, however, proves to be an effective therapy for chronic inflammation and may be a method of protecting reproductive health in adjuvance with COC. Studies show the crucial role that many inflammatory markers play in the facilitation of the menstrual cycle. Inflammatory markers are responsible for the shedding and remodeling of the endometrium throughout the menstrual cycle. Additionally, physical activity status has been shown to be an effective regulatory mechanism for a substantial number of inflammatory pathologies, often characterized by increasing concentrations of pro-inflammatory cytokines interleukin 6 (IL-6), c-reactive protein (CRP), interleukin 1-beta (IL-1β), tumor necrosis factor alpha (TNFα), and interferon gamma (IFN-γ). Participants will complete the menstrual bleeding questionnaire (MBQ) to assess menstrual symptom severity, and the international physical activity questionnaire (IPAQ) to assess physical activity status, and cytokine concentrations measured along menstrual phases including the menstruation phase (day 1), mid follicular phase (around day 7-11), ovulatory phase (day 14), and mid-luteal phase (day 20-24) will be assessed via enzyme-linked immunosorbent assay (ELISA). While participants will be grouped according to combined-oral contraceptive use (ORCO) vs no contraceptive use (CTRL), with the exception of barriers, we expect that individuals who regularly exercise; participating in ≥ 150 minutes of moderate intensity exercise per week, will have lower concentrations of pro-inflammatory markers than individuals who are not physically active.

112. Exploring environmental influences on mono-2-ethylhexyl phthalate (MEHP) exposure in common bottlenose dolphins (Tursiops truncatus) in Sarasota Bay, FL ♻

Student Presenter: Kylie Warden*
Faculty Mentor(s): Leslie Hart
Additional Authors: Miranda Dziobak (2,3), Randall S. Wells (4), Krystan A. Wilkinson (4), Paul Sandifer (5), Vijay Vulava (6)
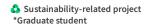
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Estuaries are sinks for contaminants, including phthalates, which are endocrine-disrupting, persistent organic pollutants widely used in plastic manufacturing. Bottlenose dolphins (Tursiops truncatus) provide critical insights into environmental health. Phthalate exposure in the long-term resident bottlenose dolphin community of Sarasota Bay, Florida, has been documented with evidence of temporal and spatial variability, particularly for mono-2-ethylhexyl phthalate (MEHP), a metabolite of a commonly used plasticizer di-2-ethylhexyl phthalate (DEHP). We hypothesize that environmental factors, such as storm events, rainfall, and harmful algal blooms, may influence this variability. This study, the most comprehensive on marine mammal phthalate exposure to date, examined associations between MEHP exposure and environmental conditions. Urine samples from 138 free-ranging dolphins (1993-2024) were screened for phthalate metabolites, reliable biomarkers of exposure. MEHP was the most common metabolite, detected in 78.3% of samples (mean = 6.19 ng/mL, s.d.=11.29 ng/mL, range = 0.04-76.6 ng/mL). MEHP exposure was not associated with sex or age (p>0.05), but we found significant associations with rainfall (p=0.007) and storm events (p=0.01) occurring 3 days and 6 months before sampling, respectively. No significant associations were found with harmful algal blooms (p>0.05). While MEHP is prevalent among Sarasota Bay dolphins, health impacts remain poorly understood despite documented toxicity to humans and other marine species. As sentinels of estuarine health, long-term exposure in dolphins may signal chronic ecotoxicological risks and broader environmental contamination trends, highlighting the need for continued monitoring and research.

113. Evaluation of Escherichia coli Contamination in Charleston County's Water Supply ♻

Student Presenter: Mayli Weathers
Faculty Mentor(s): Brian Bossak

Escherichia Coli is a single-celled, rod-shaped, and gram-negative bacterium commonly found within the digestive tract of warm-blooded organisms and as byproducts from animal and human waste. This fecal coliform can serve as an indicator organism through its presence signifying fecal contamination. This mutualistic symbiosis is beneficial for vitamin K and B12 production in humans. Exposure to E. Coli as a waterborne pathogen outside of this digestive relationship can be severely detrimental, causing diarrhea, vomiting, renal failure, infection, respiratory illness, life-threatening illness, meningitis, and death. The geographical location of Charleston threatens water quality through E. Coli exposure, due to Charleston being placed within a peninsula on the eastern coast. Lack of water testing post-plant facilitates the ability for contamination of drinking water to reach the public, potentially causing severe illness and exposure to antimicrobial resistance. This article *tests water fountains in and around the downtown Charleston, South Carolina peninsula to identify potential areas and sources of fecal contamination through E. Coli coliform colony presence, and the resulting effects on human health.

*Research is ongoing and results are subject to change as more data is obtained

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

Department of Communication

114. The Sound of Confidence: How Vocalics Shape Perceptions of Authority and Trust
Student Presenter: Jamie Askew
Faculty Mentor(s): Jen Kopfman
Additional Authors: Lucy Griffin

Effective communication extends beyond words, relying heavily on nonverbal cues such as vocalics—elements like pitch, volume, speech rate, and tone which shape perceptions of confidence. This study examines how these vocalic characteristics influence listeners' judgments of confidence, credibility, and persuasiveness. Grounded in research on nonverbal communication, the study builds on theories such as Expectancy Violations Theory (Burgoon, 1993) to explore how deviations in vocal patterns affect perceptions. Using a survey-based approach, participants from diverse demographic backgrounds will assess pre-recorded audio samples that vary in pitch, volume, and speech rate. Each respondent will rate the speaker's perceived confidence using a 7-point Likert scale. The study hypothesizes that louder, slower-paced speakers will be perceived as more confident and persuasive, with gender-specific variations influencing these perceptions. The findings will contribute to understanding vocalics' role in professional and everyday communication, offering practical insights for leadership development, workplace interactions, and public speaking. By highlighting how vocal characteristics impact listener perceptions, this research underscores the importance of vocalics in establishing authority and trust in various social and professional contexts.

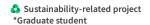**115. A qualitative content analysis of the "Just a Period" campaign**
Student Presenter: Emily Coker
Faculty Mentor(s): Beth Sundstrom
Additional Authors: Lily Ashworth, Sophia Giovannone, Harper Shepherd, Katie Sorge

The "Just a Period" campaign aims to empower individuals to take control of their menstrual health and seek appropriate treatment when necessary. This study examines how the campaign communicates the benefits of adopting recommended menstrual health behaviors and addresses the barriers to their adoption. This research explores two key aspects through a content analysis of campaign materials. First, it investigates how the campaign highlights the benefits of taking control of menstrual health, such as improved well-being, reduced stigma, and greater access to appropriate healthcare solutions. The campaign emphasizes that by seeking treatment and prioritizing menstrual health, individuals can experience enhanced quality of life and reduced disruptions to daily activities. Second, this study examines how the campaign identifies and works to overcome barriers to behavior adoption, including societal stigma, misinformation, and lack of access to healthcare resources. A qualitative content analysis of campaign messages between September 2023 and September 2024 was performed, including website posts, webinars, and written and video stories. The Health Belief Model theoretical framework and a constant comparative method were used to analyze data in NVivo. The study analyzed data from 32 sources, capturing the diverse experiences of women with PCOS, endometriosis, and adenomyosis. The campaign employs messaging strategies to normalize menstruation, provide accurate information, and promote accessible support systems. Findings suggest that the "Just a Period" campaign effectively combines benefit-focused messaging with barrier-reduction strategies to encourage individuals to manage their menstrual health proactively.

116. The Impact of Vocal Attributes on Perceived Physical Attractiveness
Student Presenter: Gabriella DeMatteo
Faculty Mentor(s): Jen Kopfman

In the field of Nonverbal communication, vocalics and kinesics of the eyes and face frame what we perceive as human attractiveness. However, the comparison between whether a voice or face is deemed attractive or unattractive is up to the eyes and ears of the beholder. With prior research, vocal characteristics indeed contribute to shaping perceptions of attractiveness. According to Flora and Hutson (2008), "Men prefer higher voices in women, and women like deeper voices in men (especially when ovulating or looking for a short-term relationship). Will you still find someone attractive if either of these components doesn't match your expectations? This project investigates the intersection between vocal and physical attributes and determines which is most likely to skew levels of attractiveness. I hypothesize that vocal characteristics, such as pitch and tone, will influence participants' perceptions of physical attractiveness, revealing that vocal and visual cues are key in forming a comprehensive understanding of an individual's appeal. I will be administering the survey to 30 participants. The independent variable, vocal characteristics (encompassing vocal attributes and pitch), influences attractiveness ratings, exploring how these vocal features enhance perceived physical attractiveness. Data will be collected in the next month, and results will be examined using a quantitative statistical analysis. The findings seek to demonstrate the complex relationship between vocal and physical components that shape one's perception of attractiveness and emphasize the importance of each attribute individually.

117. The Professionalization of Social Media Influencing: Addressing Challenges and Building Frameworks for Legitimacy
Student Presenter: Jacqueline Jevtich
Faculty Mentor(s): Ruth McSwain

The professionalization of social media influencing has rapidly gained attention as a viable career path, particularly among Generation Z. Despite its growth, the influencer industry faces significant challenges, including lack of standardized practices, unequal pay, and psychological tolls. This study aims to explore the career trajectories of both current influencers and aspiring influencers, investigating the evolving landscape of social media influencing and the professional standards needed for success. The research utilizes qualitative methods, including in-depth interviews with current influencers and focus groups with aspiring influencers, to gather insights into their experiences, aspirations, and challenges. By examining how influencers build their careers, navigate platform algorithms, and manage brand partnerships, this study seeks to provide a deeper understanding of the factors that contribute to professionalizing the industry. The findings will inform the creation of formal frameworks, ethical guidelines, and educational resources to support influencers and aspiring influencers, contributing to the legitimacy and sustainability of social media influencing as a recognized profession. Ultimately, this study seeks to advance the conversation around the professionalization of influencer careers and provide actionable recommendations for improving industry practices.

118. Taking control of menstrual health: Cues to action in the "Just a Period" campaign
Student Presenter: Kendall Kley
Faculty Mentor(s): Beth Sundstrom
Additional Authors: Gracey Hoechner, Bella Clemente, Green Sokol, Kendall Cardinale, and Gracie Stewart

Women of all ages face challenges in accessing the proper education and resources that provide the proper information about their menstrual health. Instead of offering the public a broad and generalized view of the issue, public health officials should implement a more personalized and inclusive approach that addresses a diverse range of topics, concerns, and perspectives that women can relate to. This study analyzed the campaign to provide insight into what cues of action are needed to empower women to not accept severe period pain and heavy bleeding. A qualitative content analysis of campaign messages between September 2023 and September 2024 was performed, including 83 website posts and webinars, 5 tweets, 19 Instagram posts, and 14 TikTok posts. The Health Belief Model theoretical framework and a constant comparative method were used to analyze data in NVivo. The campaign raises awareness about different menstrual health issues that help educate women on what menstrual experiences are abnormal. The campaign offers women a safe environment to share their personal stories, which empowers them not to accept severe period pain and heavy bleeding. "Just a Period" helps motivate and spread information surrounding menstrual health issues to empower women to take control of their health and confront stigmas that heavy bleeding and severe period pain is a normal part of being a woman. Results from

♻ Sustainability-related project
*Graduate student

the campaign demonstrate that these specific cues of action help break down the stigmas surrounding menstrual health, creating an environment where women can share their experiences and connect with others.

119. The Effect of Physical Appearance in Disney
Student Presenter: Samantha Morrow
Faculty Mentor(s): Jenifer Kopfman
Additional Authors: Julia Karman

This study will use content analysis to examine the contrast of Disney portrayals of villains and princess using visual codes such as clothing, facial features, body language, accessories, and color schemes. Both classic and modern Disney films will be analyzed, focusing on key characters - villains and princesses. Each visual code will be categorized, and observations will be recorded systematically using a spreadsheet. The rationale for this approach is to understand how Disney uses appearance to communicate moral and psychological traits, reinforcing cultural narratives about beauty, power, and morality. As Disney films are widely influential, especially among younger demographics, this research seeks to reveal how visual cues impact audience perceptions and social norms, particularly for younger viewers. The expected outcome is a clear understanding of how villains and princesses are differentiated visually and the cultural implications of these portrayals. This analysis will highlight how Disney uses appearance to construct the moral dichotomy between good and evil, while also uncovering potential stereotypes or biases. The broader implications of this research include encouraging critical engagement with media and its influence on societal values. Additionally, the findings could contribute to discussions about promoting more inclusive and diverse representations in children's media, challenging traditional portrayals of beauty and morality in animated films.

120. The Impact of Lighting and Noise Levels on the Casual Dining Experience
Student Presenter: Connor Murphy
Faculty Mentor(s): Jenifer Kopfman

The study of chronemics has to do with perceptions of how people choose to use and spend their time. Frequently, people choose to spend their free time out dining with friends or family. The experience they have while dining can be influenced based on the environmental factors surrounding them. The level of background music within a dining space can even impact a person's heart rate or levels of social interaction (Biswas, Lund & Szocs, 2019). This study aims to discover what type of impact lighting and noise levels have on casual dining experiences within restaurants. Observational studies will be recorded at 8 different casual dining-restaurants with varying levels of lighting and noise. 2 with high levels of noise and lighting, 2 with low levels of noise and lighting, 2 with high levels of noise and low levels of lighting, and 2 with low levels of noise and high levels of lighting. The variable being recorded will examine how long patrons remain at the given restaurant on average based on the lighting and noise levels. The results of this data will provide insight into how chronemics (the study of time) are impacted by environmental variables, and how these variables can have a positive or negative impact on the average casual dining experience.

121. Forgiveness in Friendships: Exploring the Role of Gender Norms and Other Influences in Voluntary Relationships
Student Presenter: Julia Neimark
Faculty Mentor(s): Jenna Abetz

Friendship is a voluntary relationship, making the decision to grant forgiveness after a transgression particularly complex. Several factors influence whether forgiveness is extended, including communication style, perceived severity of the transgression, length and proximity of the friendship, and the ownership of one's actions. While previous research has primarily examined forgiveness through the lens of heterosexual, cisgender norms, this study seeks to verify those findings further. Additionally, it explores how gender norms shape forgiveness, including queer friendships. Through interviews with college undergraduates, the research confirms the significance of these influences while shedding light on additional complexities unique to queer friendships. Findings suggest that voluntary relationships present distinct challenges in the forgiveness process, as the absence of societal or structural pressures to maintain these bonds introduces more barriers to reconciliation. This study contributes to a

deeper understanding of how gender norms function in friendship dynamics and how they impact conflict resolution.

122. "Swipe Right on Looks? Examining the Role of Physical Appearance in Online Dating Apps"
Student Presenter: Mia Pardini
Faculty Mentor(s): Jenifer Kopfman
Additional Authors: Summer Wolcott

The goal of this study is to examine how physical appearance and attractiveness influence a person's decision on a dating app. A theory that supports this information is the Halo Effect. The Halo Effect is the idea that people who are more attractive are viewed as smarter, friendlier, intelligent, etc. The concept was first identified by psychologist Edward Thorndike in the 1920s, who observed that when people form a favorable impression of someone (e.g., thinking someone is attractive or likable), they often assume the person also possesses other positive traits, such as being intelligent, competent, or kind. What factors influence peoples' decisions on a dating app? We will examine this question using interviews followed by qualitative data analysis. A diverse sample of individuals will be selected focusing on those actively using online dating platforms such as Tinder or Hinge. We will include various age groups, genders, and cultural backgrounds to examine differences in how appearance is perceived and prioritized. The questions explore the role of physical appearance in online dating, focusing on how it influences interactions and profile presentation. They examine the impact of societal beauty standards on self-presentation and evaluation of others. Additionally, they compare the importance of visual elements (photos) with non-visual aspects (bios, prompts) in attracting and selecting matches. Our data will be examined for themes and patterns related to physical appearance and attractiveness.

123. Exploring the Role of Color Analysis in Business
Student Presenter: Lily Pike
Faculty Mentor(s): Jenifer Kopfman

Color plays a crucial role in nonverbal communication, shaping perceptions of mood, confidence, and authority. Color plays a crucial role in nonverbal communication, shaping perceptions of mood, confidence, and authority, with research showing that color influences psychological and emotional responses (Hanada, 2018) and affects how individuals are perceived in professional and social settings (Kodžoman et al., 2022). This study examines how color analysis, a method used in personal styling, enhances self-presentation and nonverbal messaging. Through semi-structured interviews with certified color analysts, the research explores the intersection of color choices and kinesics - body language - as communicative tools. Additionally, a personal color analysis session provides firsthand insights into the practical application of these concepts. Findings are expected to demonstrate how strategic color choices reinforce intended nonverbal cues, influencing both personal and professional interactions. This research contributes to the fields of communication and personal styling by bridging theoretical frameworks with real-world applications. Understanding how appearance and kinesics interact offers valuable implications for professionals seeking to refine their self-presentation and individuals looking to harness the power of color in everyday communication.

124. Exploring Empathy and Nonverbal Communication
Student Presenter: Kailee Rafalko
Faculty Mentor(s): Jen Kopfman

Humans are social beings so we crave to foster relationships with those around us. The ability to demonstrate certain psychological elements can directly impact the number and quality of relationships that one has. This study will focus on one of those elements, which is empathy. Empathy can be defined as the "capacity to take the role of the other person with whom one is socially implicated" (Mead, 1934, p. 366). It will explore a connection between one's ability to empathize and their ability to read/react to others' nonverbal communication behaviors. It will test a hypothesis that states high levels of empathy coordinate with accuracy of emotion recognition. This study will be conducted through the survey method and will contain a total of 26 questions. 16 questions will evaluate participants' level of empathy through the Toronto Empathy Questionnaire (Spreng et al., 2009). The rest of the

survey will evaluate participants' accuracy of emotion recognition. Data will be collected in the next month and will be analyzed with a quantitative statistical analysis. This study will aim to analyze how an individual's empathic levels relate to their ability to identify emotions through nonverbal communication. By identifying patterns within this connection, we can infer conclusions about the quality and quantity of one's platonic and romantic relationships.

125. Behind Closed Curtains: How Live Theater Impacts Child Performers
Student Presenter: Blakesley Rhett
Faculty Mentor(s): Ryan Milner

In contemporary society there has been a rise in film and television child stars coming forward to tell their stories of abuse they faced within the industry, such as child actor turned talk show host Drew Barrymore and former Nickelodeon star Jennette McCurdy; noticeably, information surrounding child performers involved in live theater have been absent from these conversations. Through my research I conducted a series of interviews ranging from former professional child performers to theater educators to answer the question: What are the long term effects of child performers involved in life theater? By focusing on breaking down the daily lives of child performers and understanding how being involved in live theater from a young age can impact an individual into adulthood in the areas of physical, social and psychological; the general public can gain a better understanding of the long-lasting effects on children of being involved in live theater and consider a larger question of if using child performers in any medium is truly ethical. My findings indicate that while there are numerous cases of performing in live theater putting psychological strain on the children involved; the child performers often have a rise in confidence and public speaking ability and as adults, look back on their time as child performers fondly.

126. Exploring Proxemic Behavior: Gender Differences in Public Spaces and Their Implications for Social Interaction
Student Presenter: Julia Shave
Faculty Mentor(s): Jen Kopfman

Proxemics, the study of personal space and spatial behavior, plays a large role in social interactions, particularly in a globalized world where cultural and gender-based differences influence communication. This research explores gender-based differences in proxemic behaviors within public spaces, focusing on how men and women maintain their personal space in both informal and formal settings. Existing studies suggest men generally prefer larger personal space zones than women (Crawford, 2002), but few studies have examined these preferences in public spaces. Using observational methods, this study examines proxemic behavior by recording interpersonal distances among male-male, female-female, and male-female interactions in various public settings such as libraries, parks, and busy streets. The data is categorized based on Edward T. Hall's spatial zones-intimate, personal, social, and public- to analyze patterns and physical distance. The study hypothesized that men will maintain greater physical distance than women, particularly in male-male interactions, and that these differences will be more pronounced in formal/public settings. Findings from this research will contribute to a deeper understanding of gendered spatial norms and their impact on social comfort, communication, and interaction dynamics. The implications extend to cross-cultural communication, workplace interactions, and public space design, emphasizing the importance of recognizing and respecting diverse proxemic preferences to foster effective and inclusive social interactions.

127. Evaluating the Impact of the "Just A Period" Campaign:An In-Depth Analysis
Student Presenter: Charlotte Ward
Faculty Mentor(s): Beth Sundstrom
Additional Authors: Paige Meyer, Olivia Suied, Bridget Degnan, Rachel Christensen and Callie Skipper

Tens of millions of women around the world menstruate regularly, and a large portion of them suffer from severe conditions like heavy bleeding, metrorrhagia, and period pain. These symptoms often disrupt women's lives, making it difficult for them to fulfill work, family, and personal responsibilities. The "Just A Period" Campaign is an educational and advocacy initiative launched by the charity Wellbeing of Women to address critical gaps in menstrual health education and care. Wellbeing of Women positions itself as a leader in driving change in women's health. This research examines how the "Just a Period" campaign frames the health threats of severe period pain

and heavy bleeding and whether it models different pathways for seeking help and treatment. A qualitative content analysis of campaign messages between September 2023 and September 2024 was performed, including 32 website posts and webinars, 22 written and video stories, 5 tweets, 20 Instagram posts/Facebook, and 14 TikTok posts. The Health Belief Model theoretical framework and a constant comparative method were used to analyze data in NVivo 14. The findings suggest that the campaign effectively highlights the severity of menstrual health issues, framing them as legitimate medical concerns while also promoting inclusive and approachable ways for people to seek medical support. By challenging long-standing dismissal around menstruation, the campaign empowers individuals to take control of their menstrual health and seek appropriate care.

128. The Martin Center for Mentorship Communication Campaign
Student Presenter: Lindsay White
Faculty Mentor(s): Amanda Ruth-Mcswain
Additional Authors: Lauren Stevens, Gillian Beville, Chase Chewning, Amanda Jackson
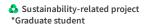
The COMM Agency at the College of Charleston partnered with The Martin Center for Mentorship to design a strategic communication campaign with the goal of motivating participation in Center programming. To inform campaign planning efforts, the agency team started with a client discovery phase that included both primary and secondary research methods to develop an insights report for the client. Through informal interviews with the client, surveys with stakeholders, an analysis of peer organizations, and a communication audit of client communication assets, several key insights were identified as relevant to the communication planning process and instructional to the agency's ability to address The Martin Center's greatest communication needs. The campaign "It's Your Time" was developed and includes campaign messaging, as well as communication strategies and tactics directly connected to the insights gleaned from the client discovery phase.

Department of English

129. "The Perfect Future in the Present": Analyzing Nathaniel Hawthorne's Short Stories in the Context of the Modern American Healthcare System
Student Presenter: Elli Batchelor
Faculty Mentor(s): Scott Peeples

America is fascinated with the myth of constant progress and the idea that more technological innovation indubitably leads to a better, more efficient medical system. However, an examination of Nathaniel Hawthorne's short stories demonstrates this notion of linear progress is not accurate, as modern medical issues are ever-present in Hawthorne's work nearly 200 years prior. Despite writing in a time that did not reflect the same authoritative, bureaucratic medical culture that medical humanities scholars currently critique, the exploitative relationships between doctors and their subjects that Hawthorne investigates echo these same concerns and speak to his lasting relevance. His work foreshadows ethical dilemmas and deficiencies of the medical system while also supporting the core mission of medical humanities, which is that medicine should be holistic, center patients' experiences, and retain empathy. He thus demonstrates the subdiscipline's necessity and legitimacy. Even beyond exemplifying the role of humanity and identity in scientific endeavors, Hawthorne's work shows how specific identities directly inform healthcare experiences. Reading Hawthorne through a feminist lens reveals how stories such as "Rappaccini's Daughter" and "The Birthmark" draw attention to the hidden oppressive structures and gender politics that govern modern medicine, such as the continuous exploitation of women's bodies and the trivialization of women's healthcare issues. Medical humanities addresses broad issues of health disparities, lack of empathy, and doctor-patient relationships, but Hawthorne dives even deeper into how women's subject position makes them particularly vulnerable to these adverse aspects of the medical system.

130. Jolt of the Charleston Medical University of South Carolina Strike

Student Presenter: Kaley Byers
Faculty Mentor(s): Valerie Frazier

Picture a world where you encounter discrimination and unequal pay every day and are told to do nothing. Then one day you decide to take a stand that results in a ripple effect, creating change throughout your entire city for years to come. This is exactly what took place in the Charleston Hospital Movement in 1968-1969 (LDHI). During the 60's many healthcare workers in Charleston were called "monkey grunt" along with other horrendous names, paid lower wages than their white counterparts, and excluded from employee spaces. (LDHI) Black workers found the courage to voice their issues when 5 nurse aides were fired when they attempted to tell their employer the white charge nurse prevented them from getting files needed for patient care. (LDHI) An increase in notice of these inequities by activists like William Saunders, led to the strike in 1968, which resulted in higher pay for black employees and laid out a proper procedure for them to voice opinions without fear of firing. (LDHI) Overall, the strike was a gateway for change in the healthcare industry in Charleston and provided change in the late 60's and in the present time where there is an emphasis on inclusion of all those in health care no matter their color. However, we can't let the strike's message of equality die with its hidden leaders like Mary Moultrie, so we as a community can reflect to make changes so medicine, whether a patient or provider, is inclusive to all.

131. The Importance of Marches
Student Presenter: Octavius Daniels
Faculty Mentor(s): Valerie Frazier

The fight for justice and equality in the United States has taken many forms, with African Americans employing a variety of methods to challenge oppression. These include peaceful demonstrations such as sit-ins, boycotts, and freedom rides. However, one of the most powerful forms of protest throughout history has been the march. This brings to mind the biblical story of the "Wall of Jericho," where the children of Israel marched around the city seven times, causing its walls to fall and clearing their path to the promised land. In much the same way, marches during the Civil Rights Movement sought to break down the barriers of injustice and inequality that stood in the way of basic human rights. The marchers were not facing physical walls, but rather a system of oppression that denied them their promised rights. From the Selma to Montgomery marches to the March on Washington for Jobs and Freedom, countless people took to the streets, demanding justice and equal treatment. The different marches of the Civil Rights movement served as a symbol of unity, resilience, and a relentless pursuit of equality. It portrayed the perseverance of African Americans in this country and how we are willing to keep moving and fighting for justice. These marches brought national attention, leading to historic legislation, including the Civil Rights Act and the Voting Rights Act. Their courage and determination paved the way for future generations, ensuring that African Americans continue to benefit from the rights and freedoms that were once denied.

132. Rev. Nelson B. Rivers III ♻️
Student Presenter: Otis Franklin III
Faculty Mentor(s): Valerie Frazier

Charleston's civil rights history is full of well-known national figures, yet local leaders like Rev. Nelson B. Rivers III have played an equally crucial role in fighting for social justice. My research explores Rivers' impact as a preacher, civil rights leader, and community organizer, highlighting his contributions to political representation, racial justice, and grassroots activism. To understand his influence, I examined primary sources, including his sermons at Charity Missionary Baptist Church, which I attend, analyzed historical records of his leadership in the NAACP, and conducted a personal interview with him. Additionally, I explored his role in organizing South Carolina's largest civil rights demonstration in January 2000 and his efforts with the Charleston Area Justice Ministry. My findings reveal that Rivers' leadership has led to tangible change, such as the election of over 300 Black officials in South Carolina and the removal of Confederate symbols. His work shows the power that faith-based activism can have in driving social change. Furthermore, my research highlights the significance of personal connections in the civil rights movement. His mentorship, public advocacy, and community-building efforts continue to inspire new generations of leaders. By shedding light on Rev. Rivers' legacy, this research tells an untold story in the broader civil rights narrative. Emphasizing that progress can often begin with grassroots leaders. Recognizing these

contributions is essential to understanding the full scope of the civil rights movement and applying its lessons to today's fight for racial and social justice.

133. Jonathan Grant: 1967 Legacy Abstract (Septima P. Clark: Black Excellence)
Student Presenter: Jonathan Grant
Faculty Mentor(s): Valerie Frazier

When discussing great Black leaders, names like Martin Luther King Jr., Malcolm X, and Rosa Parks often come to mind. However, a crucial figure often overlooked is Septima Clark, a woman who embodied "Black excellence." Before joining the 1967 Legacy Program at the College of Charleston, I had never heard of her, despite her significant contributions. Carter G. Woodson believed that education was vital for uplifting Black communities, and Septima Clark's life exemplifies this. She founded the Highlander Folk School, where she trained activists to use education as a tool for social change. She also established Citizenship Schools that taught literacy and civic skills, enabling Black citizens in the South to pass literacy tests required for voting. Clark's work empowered disenfranchised Black communities and played a critical role in the Civil Rights Movement. Born on the College of Charleston campus, her contributions are honored locally through the Septima P. Clark Auditorium and a mural in the Education Center. Nationally, her legacy must be recognized alongside other great leaders, as her efforts allowed many Black citizens the right to vote. Due to her work, Septima Clark is known as "The Mother of the Civil Rights Movement," and we must continue to honor her name as such.

134. Comparing the Perception of the Effectiveness Of Physical Activity and/or Counseling in Allowing Individuals to Maintain a Positive and Stable Mental Health ♻
Student Presenter: Mackenzie Hayes
Faculty Mentor(s): Valerie Frazier

Counseling and physical activity are well-researched strategies proven to help promote positive and stable mental health in individuals. This research explores a gap in mental health knowledge in considering how individuals (ages 18-29) believe they benefit from mental health coping strategies. It compares the effectiveness of physical activity and counseling on an individual's belief that they are developing positive and stable mental health and how that translates to an individual's preference of coping strategy. The research implemented a self-reported, mixed-method, quantitative, and qualitative survey utilizing numerically scaled, multiple-choice, and free-response questions to collect sufficient data. Data was analyzed and represented using descriptive statistics (percentages), linear models, comparative bar graphs, and a Pearson Correlation Analysis to evaluate the collected responses. Results suggested that there was no noticeable difference between a belief in the benefits of physical activity and/or counseling on mental health and a preference for a particular coping strategy. The linear model and comparative bar graphs suggested that a majority of participants believed one or both of the strategies (physical activity and/or counseling) to have a moderate positive effect on their mental health; however, the positive effect reported did not have a strong correlation towards their preference of a particular coping strategy. This belief in effectiveness but lack of preference has implications for the field of mental health research and health professionals recommending either counseling and/or physical activity as a coping strategy for poor mental health, suggesting that daily physical activity may be more effective financially and practically for individuals.

135. The Avery Research Center: A Hidden Gem of Charleston
Student Presenter: Logan Kelly
Faculty Mentor(s): Valerie Frazier

The Avery Research Center for African American History and Culture, located on the campus of the College of Charleston in South Carolina, is a pivotal institution preserving African American heritage. Founded in 1865 as the Avery Normal Institute, it played a crucial role in educating Black scholars during segregation. Though it closed in 1954, it was revived in 1978 by alumni and supporters, eventually reopening in 1990 as an archival repository and museum. This research paper explores the Center's establishment, collections, and impact on the Charleston community. The Avery Research Center offers free access to its exhibits and archives, providing valuable educational resources. Its role in documenting civil rights achievements and fostering social justice is highlighted

through its displays and community engagement initiatives. The Center's influence extends beyond education, inspiring social change and community involvement. The Avery Research Center hosts exhibitions, educational events, and charitable activities, supporting the local community and promoting African American history. This study emphasizes the importance of recognizing and supporting such institutions that enrich cultural and historical narratives. Through an analysis of the Avery Research Center's contributions, this paper underscores its significance as a hidden gem in Charleston, advocating for greater recognition and support for similar institutions. The findings advocate for the preservation and celebration of African American achievements, aligning with the broader narrative of American history.

136. The Kress SIt-In ♻
Student Presenter: Gabrielle Mann
Faculty Mentor(s): Valerie Frazier

My presentation, "Hidden Figures: James Baker and the Kress Sit-in," will explore the pivotal role of the 1960 Kress Sit-in in Charleston's civil rights history. This event, led by James Baker and 24 African American students from Burke High School, marked a significant stand against racial segregation. By examining the strategic planning, key figures like Minerva and Milicent Brown, and Harvey Gantt's journey from protestor to mayor, the presentation will highlight the bravery and resilience of these young activists. This presentation will contribute to the College of Charleston by deepening the understanding of local civil rights history, inspiring current students with stories of youthful activism, and fostering a greater appreciation for the historical significance of Charleston's landmarks. It aims to encourage students to reflect on the impact of grassroots movements and the importance of standing up for social justice.

137. The Marvelous Millicent E. Brown
Student Presenter: Trinity Metcalf
Faculty Mentor(s): Valerie Frazier

Millicent E. Brown, Charleston Native and 1975 Alumni of the College, has had a major impact on the civil rights movement and advancement within the Chrleston community. From being the first to integrate Charleston School District No. 20 to her book Another Sojourner Looking for Truth, her impact is undeniable. Daughter to the president of the NAACP charleston chapter and resident of 270 Ashley Ave, she grew up surrounded by several influential individuals fighting to make a difference. In addition to her book, she has worked on connecting and sharing the stories of other individuals who were the first to integrate schools during the height of the civil rights movement, known as the "Someone Had to Do It." She continues her work today advocating for social justice as she is committed to the ongoing struggle for humanity. Her life experiences and wisdom, while often underrepresented, continue to inspire so many, including me.

138. Thriving Under Pressure: Millicent Brown's Role in Desegregation and Civil Rights Activism
Student Presenter: Ramsey Ray
Faculty Mentor(s): Valerie Frazier

This research explores how Millicent Brown endured and thrived under immense pressure as one of the first African American students to integrate an all-white school in South Carolina. While desegregation is well-documented, less is known about the personal sacrifices and psychological toll on those involved. Using historical texts, archival interviews, and Brown's own testimonies, this study examines her experiences with racial hostility, social isolation, and severe anxiety. Despite these challenges, she graduated and became a scholar, educator, and activist. Influenced by her father, NAACP leader J. Arthur Brown, she committed her life to civil rights education, documenting the struggles of desegregation pioneers. The findings highlight the resilience required to break racial barriers and the long-term impact of such experiences. Brown's work ensures that the history of desegregation is preserved, filling a crucial gap in understanding the emotional and psychological challenges faced by those who paved the way for integration.

Department of History

139. Kazakhstan as Pawn or Queen? The Evolution of Foreign Relations After Independence
Student Presenter: Dallas Beardsley-Deveau
Faculty Mentor(s): Irina Gigova

Coming from the body blow of collapse of the Soviet Union in 1991, several new countries emerged in Central Asia from the former Soviet dominated lands. One of these is Kazakhstan, a country with a history intertwined in Russia's, and one that has had to do a delicate dance of survival ever since its inception in in late 1991. With their shared history and people looming large in Kazakhstan's rearview mirror, it made sense not only politically but economically for Kazakhstan to ally with Russia during the early 1990s. But what about the relations Kazakhstan had with the other major player in the Cold War? The United States had a vested interest in Kazakhstan for several reasons, ranging from nuclear capability, natural resources, and the constraint of Russian imperialism. They were more than happy to welcome the independence of Kazakhstan, being the first country to recognize its legitimacy. This essay analyzes how Kazakhstan navigated its first ten years of independence from the Socialist Republic of the past and with a diverse population in a geopolitically tense area and a government that had very little real experience in foreign relations. Did Kazakhstan end up being a pawn between the Great Powers, or did it somehow, miraculously, become a country able to stand on its own two feet, and took advantage of its situation to become the controlling power on its chess board?

140. Continuing the Colony in the Democratic Republic of the Congo through the Congo Crisis
Student Presenter: Khadija Boutchich
Faculty Mentor(s): Elisa Jones

On June 30, 1960, the Democratic Republic of Congo (DRC) became newly independent from Belgium, precipitating what is known as the Congo Crisis. The first democratically elected leaders, President Joseph Kasavubu and Prime Minister Patrice Lumumba, took power after almost a century of violent oppression. By analyzing CIA and other intelligence reports, it is made clear that Western powers worked to assassinate Patrice Lumumba and destabilize the Congo in order to maintain exploitative economic ties to the mines that provided minerals used in bombs and other technology. Scholarship on the Congo Crisis since the declassification of intelligence documents focuses on either CIA or Soviet Union (USSR) influence in the Congo Crisis. By comparing existing approaches to the study of the Congo Crisis that focus on the Eastern and Western Bloc to primary sources, highlighting the biases in the original intelligence documents, I conclude that foreign intervention in the Congo was used to continue colonialism. Often the Cold War is discussed as a necessary method of restricting communism while avoiding an all-out war. However, by focusing on Patrice Lumumba's assassination and the Congo Crisis in the DRC, this research shows the Cold War as a means to an end when it came to extending colonization. Just as the first colonies were ruled differently than the ones that are thought of as the last, colonial control in the Congo did not end, but morphed into something the metropoles could sell to their citizens, claim less responsibility for, and still profit from.

141. The Pollitzer Sisters' Impact on College of Charleston Coeducation
Student Presenter: Ella Duffner
Faculty Mentor(s): Eliza Jones

My research explores how the Pollitzer sisters, Mabel, Carrie, and Anita Pollitzer, skillfully struck a balance between progressive reform and conventional Southern gender norms in order to effectively promote coeducation at the College of Charleston between 1910 and 1920. The study shows that the sisters purposefully used ideas of traditional feminine propriety in the process of pursuing their goals to have white women admitted to the College through recognized channels such as the Charleston Federation of Women's Clubs. Analyzing primary sources such as newspaper articles, correspondence, oral histories, and commemorative materials, I demonstrate that, instead of overtly challenging societal norms, the sisters used the wartime situation to further their objectives and presented

coeducation as an extension of women's traditional cultural impact. Their strategy serves as an example of how Southern women reformers in the early twentieth century were able to achieve significant social change despite pre-existing cultural limitations. By showing how intentional conformity to gender norms was a useful instrument for progressive change, the research advances our knowledge of women's fight for inclusion in higher education in the American South and the difficult choices faced by advocates for the expansion of higher education.

142. Eurasianism and Contemporary Russian Identity: The Contributions of Aleksandr Dugin's Writings ♻
Student Presenter: Boris Halachev
Faculty Mentor(s): Irina Gigova

The Russian concept of Eurasianism has seen a few different iterations since its emergence in the 1920s into a thriving philosophy today. A chief contributor to the development of Eurasianism was political philosopher Aleksandr Dugin, a supporter of Russian president Vladimir Putin and an advocate of a multi-polar world that challenges Western hegemony. By analyzing Dugin's twenty-first-century thought, this research project will use an interdisciplinary approach to examine the historical evolution of Eurasianism into a geopolitical philosophy that justifies Putin's foreign policy in the former Soviet space. Originally developed by Russian √©migr√©s between the First and Second World War, Russian Eurasianism built upon a long-held Russian belief that Russia's development diverged from the traditional East and West dichotomy. This philosophy gained traction during the Soviet period, as it incorporated peoples and territories associated with the former Russian Empire into the Soviet project. The ideology evolved after the fall of the Soviet Union in 1991, adding a newfound distaste for the US-led Western world and an additional expansionist ideal to these multi-ethnic aspirations. The ideology has become more popular over the last 30 years ‚Äì igniting similar philosophies in Turkey, Hungary, and Central Asia ‚Äì with Aleksandr Dugin as a key figure contributing to a wealth of literature on geopolitics that informs Russian foreign policy today.

143. How did the Holodomor Contribute to Ukrainian National Identity
Student Presenter: Stephen Hand
Faculty Mentor(s): Irina Gigova

In 1932-1933, a massive famine in Ukraine took place, known today as Holodomor. Historians are still debating what caused this famine, which killed several million people, and why it seemed to target Ukrainians in the Soviet Union. One argument is that the Soviet Union began the famine specifically to target Ukrainians, in order to stop the rise in nationalism in the republic of Ukraine. The other side of the argument is that the disaster, while devastating, was due to natural events such as drought and poor harvest, as well as mismanagement by local officials. Whatever the reason, the Holodomor has given the Ukrainian people a cultural narrative, which has become central to Ukrainian identity and desire for independence. This research looks at how the famine affected Ukrainian nationalism, and how the Holodomor narrative evolved over time. Despite widespread deaths, the Soviet government censored any information about the famine until the late 1980s. This led to Ukrainians living outside the Soviet Union, in places like Canada and the United States, to examine survivor stories and firsthand accounts to create a narrative that was adopted by Ukraine once it gained independence in 1991. Some of the sources used for this paper were narratives from westerners who traveled in Ukraine during this time, and recording their experiences. This topic is especially important due to the Russian invasion of Ukraine, which many Ukrainians see as evidence for the Holodomor being an intentional genocide.

144. "Contemporary Astropolitics" ♻
Student Presenter: Joseph Held
Faculty Mentor(s): Irina Gigova

My work examines the history of early space exploration, Cold War diplomacy, and international law to trace the evolution of geopolitics in Earth's orbit and beyond. The once-futuristic field of "astropolitics," or the politics of space use and exploration, is becoming increasingly relevant in the 21st century. Therefore, the study of its origins is of paramount importance. My paper finds that the modern multipolar space environment and current threats to world space infrastructure are directly connected to historical developments in space exploration. My research

♻ Sustainability-related project
*Graduate student

focuses on the Soviet Union's pivotal role in shaping international space politics, analyzing its interactions with the United States and the emergence of China's space program. Using a multidisciplinary approach that combines analysis of technical documents, government communiqués, international treaties, and primary sources, I demonstrate how decisions and achievements from nearly a century ago continue to influence the use of space. By tracking technology transfers, espionage, and diplomatic efforts since World War II, this study highlights the Soviet Union's contributions to the ongoing militarization and nationalism in space. Additionally, it explores the strategic and ideological forces of the Cold War that shaped the treaties, norms, and customs underlying modern space law. Ultimately, the paper concludes that the current weaponization of space is not a recent phenomenon but rather a continuation of the militaristic foundations of space exploration.

145. From the Jungle to Jim Crow: Black Soldiers Caught Between War and Injustice
Student Presenter: Jean Carlos Herrera
Faculty Mentor(s): Elisa Jones

The 1960s were a pivotal time in American history, characterized by a surge in African American activism against systemic injustices and segregation. Simultaneously, many of these individuals found themselves serving in a military that often mirrored the same racial inequalities they faced at home. This project focuses on the interconnected narratives of African American troops during the Vietnam War and the Civil Rights Movement, emphasizing the distinct challenges and experiences of Black GIs. Very little has been written on the experiences of African American GIs during Vietnam. I address this gap in knowledge by incorporating the experience of African American GIs into this historiography. I conclude that the experiences of African American troops in Vietnam were not merely a reflection of the war but were deeply entangled with the struggles for civil rights unfolding across the United States. Using a variety of primary sources, including interviews with Vietnam veterans themselves, my research aims to construct a cohesive narrative that captures the complexities of the African American military experience and its significance within the framework of the Civil Rights Movement. This research explores how discriminatory practices within the military reinforced the broader societal injustices faced by African Americans. It highlights the paradox of African Americans risking their lives for a country that devalued their existence and rights. In addition, it examines how factors such as the disproportionate representation of African American troops in combat roles created resistance inside the military that shared similarities with the environment developing at home.

146. The Odyssey of the Hmong: Migration Across Lands and Time
Student Presenter: Carmela Johnson
Faculty Mentor(s): Amy Gordanier

The migration of the Hmong people to premodern China reflects a profound story of resilience and cultural preservation. Originating from Tibet, Mongolia, and Siberia, the Hmong faced harsh climates, resource scarcity, and sociopolitical pressures, including conflicts and displacement by expanding empires. These challenges forced them to migrate southward over centuries, with movements traced back to around 3000 BCE. Upon reaching China, the Hmong established agrarian societies while maintaining their unique cultural identity despite efforts to assimilate them. Central to this preservation was the oral tradition, which passed down history, values, and customs through generations. Without reliance on written records, oral storytelling ensured the continuity of Hmong heritage even in times of suppression. The Hmong's clan-based social structure also played a vital role, fostering strong communal bonds and safeguarding traditions such as clothing, festivals, and ceremonies. Their spiritual practices, centered on animism and ancestor worship, further solidified their cultural identity, offering both a connection to their past and a means to resist assimilation. This balance of adaptation and preservation allowed the Hmong to integrate into new environments while retaining their distinct identity. Their migration not only highlights the challenges of displacement but also underscores the enduring strength of their cultural legacy, making them a vital part of the historical and cultural fabric of premodern China.

147. Popular Protest in the Anglo-Scottish Union
Student Presenter: Madison McKnight
Faculty Mentor(s): Jason Coy

In 1603, after Queen Elizabeth I of England died without an heir, King James VI of Scotland inherited the English throne, uniting the two crowns in a dynastic union in what became known as the Union of the Crowns. This initial union did not result in a complete political or socio-economic union as that was not achieved until 1707, when the two kingdoms were consolidated under one British Parliament. The 1707 union heightened tensions between England and Scotland, as it replaced the previous union, which preserved Scottish autonomy, with one that required Scotland to surrender its sovereignty. England and Scotland have a long-standing history of antagonism that made the process of unification during the seventeenth and eighteenth centuries challenging. The Scots resisted the union due to concerns regarding independence, as expressed in the emerging popular protest. This research explores how popular protests surrounding the 1603 and 1707 unions were distinctly anti-union, manifesting in diverse forms driven by concerns over Scottish identity, representation, and economic interests. This research combines social and cultural history, analyzing contemporary primary sources such as newspapers, printed pamphlets, letters of correspondence, ballads, literature, court records, petitions, protests, and riots to explore the influence of public opinion and the motivation, resistance, and consequences of the Anglo-Scottish Union. While select Scottish elites benefited from the union, widespread public skepticism persisted from the onset of the union and continues to influence contemporary debates, as reflected in the modern Scottish Independence Movement.

148. Social Death and the Boundaries of Prisoner Agency in the 1970s Angola Prison Fields
Student Presenter: Eliza Parrott
Faculty Mentor(s): Elisa Jones

In the early 1970s, Angola Prison in Louisiana was known as "the bloodiest prison in America." Despite federal reforms, agricultural labor continued and perpetuated the prisoners' "social death," a sociological phenomenon that relegates people to a subhuman status through subjection to violence, humiliation, and natal alienation (or isolation from family). I explore agricultural prison labor at Angola through the lens of social death and its restrictions on agency. This approach was inspired by historian Marisa Fuentes' groundbreaking work on the archival representation of enslaved women in Barbados that reframes inconsequential acts as acts of enslaved agency. Major comparisons can be drawn between the social death of the enslaved and prison field workers, which have narrow implications for the boundaries of their agency. However, I consider smaller acts in the everyday lives of field workers as acts of agency, such as musicality and maintaining religious faith. My evidence is centered on the voices of prisoners themselves in the 1970-1979 editions of the prison magazine The Angolite, edited at the time by convicted murderer Wilbert Rideau. My methodological approach conceives of individual agency broadly, not as acts with an end goal, but as autonomy of the mind and body. This new definition of agency questions conclusions historians have made about the agency of other socially dead groups. By understanding how social death narrows agency, but does not erase it, historians can review other social death victims and grant them agency that they lacked in life.

149. Queerness in the Harlem Renaissance
Student Presenter: Kaitlyn Roemer
Faculty Mentor(s): Sandy Slater

Illustrating the significant yet often overlooked role of queerness in shaping the Harlem Renaissance. A period of cultural and artistic revolution from 1920's to the early 1930's, ending at the Great Depression. Through analysis of both literary works and musical performance, the study demonstrates how queer sensibilities and experiences were integral to the movement. The research explores how Black writers and performers challenged conventional narratives of race, sexualities and gender through a variety of artistic mediums. Queer artistic expression was uniquely positioned to explore racial identity and social norms. This was done through long form literature, poetry and the blues traditions. Further contending nightlife culture significantly provided sites for queer expression and community building. Close readings of period literature reveal complex explorations of sexuality and gender fluidity. While analysis of blues lyrics and performances demonstrate how musical spaces enabled coded expressions of queer desire. This work draws on recent scholarship in racial and queer studies, showcasing that queerness was not peripheral, but rather, central to the Harlem Renaissance.

150. Alexander Magnus: The Image of Alexander the Great in the Roman World
Student Presenter: Kelli Ryan
Faculty Mentor(s): Andrew Alwine

This paper discusses the impacts of political and historical events on the use of the image of Alexander the Great by Roman political figures. The scope of the paper spans from the Middle Republic to the Late Imperial period. Through my research I wanted to determine to what extent Roman political figures were modeling themselves after the image of Alexander and whether this went beyond simple imitation or if these figures were creating an image of Alexander in order to model themselves after the image created. From these questions I was able to settle on a few figures accused of Alexander imitation. Namely, Scipio Africanus, Julius Caesar, Gnaeus Pompey, Augustus, Caligula, Trajan, and Julian. As a result, I concluded that the reception of the image of Alexander was largely influenced by the specific historical and social contexts of each time period.

151. Relics and Clerics in the High Middle Ages: Concerns, Critiques, Contributions, and Control
Student Presenter: William Spencer
Faculty Mentor(s): Phyllis Justice

The holy relics of deceased saints were sacred treasures venerated in medieval Christianity. The great spiritual significance that local Christians and visiting pilgrims alike ascribed to relics gave the relics political, economic, and religious power during a time of great societal and religious change throughout the eleventh to thirteenth centuries. Many aspects of popular religion involved relics, from pilgrimage to oaths to ritual curses. That importance is well known, but less studied is the integral role of the clergy in driving and shaping the use of relics. Relevant primary sources reflect the rising importance and changing role of relics that were driven by the medieval clergy and papacy, not just the populace. My Bachelor's Essay examines this phenomenon, arguing that clerical concerns and critiques of relics' authenticity, acquisition, and popular practices reflect the clergy's desires and attempts to shape and use the cult of relics to understand the world and exert influence in their interactions with the populace and nobility.

152. The Lost Cause Myth and Lack of African American Preservation in Upstate South Carolina ♻
Student Presenter: Lutz Wright
Faculty Mentor(s): Irina Gigova

Originally from Spartanburg South Carolina, I have researched a chimney that sits on Stillhouse Road in Roebuck, South Carolina. Through different documents like census records, land grants and wills, I have discovered that this was a slave cabin. However, because of the lost cause rhetoric that swept through the upstate of South Carolina in the mid-twentieth century, I have found it difficult to find anyone interested in preserving this chimney and have received backlash from members of the community telling me that my time is better spent elsewhere. Because of these events, I have become passionate in presenting, "The Lost Cause Myth and the lack of African American Preservation in Upstate South Carolina".

Department of Political Science

153. Senate Bill Eight: Policy Proposal
Student Presenter: Emma Botzenhardt
Faculty Mentor(s): Lynn Ford

Senate Bill 8 is Texas's state abortion ban which outlaws abortions once a fetal heartbeat has been detected, usually around 5-6 weeks into a pregnancy with the exception of saving the life of the mother. S.B 8 is enforced through

civil lawsuits and uniquely evades judicial review through its enforcement strategies. The state of Texas is not able to enforce S.B 8 but other citizens are, which has transformed American people into bounty hunters. The use of civil lawsuits to evade pre-enforcement litigation and judicial review has created a constitutional loophole that threatens American democracy. Women in Texas are suffering under S.B 8 as their right to bodily autonomy and economic freedom have been stripped away. Systematically marginalized groups are disproportionately harmed by abortion restrictions as the cost to receive care has significantly risen due to their need to travel to receive care. However, with the enforcement of the Women's Health Protection Act of 2023, women in America would have the federal protections to decide whether or not they want to continue their pregnancy. The Equal Access to Abortion Coverage in Health Insurance Act is required to truly provide equal abortion access. It ensures that the federal government must provide coverage for abortion services to every person who uses federal insurance. The purpose of these acts is to promote equal access to abortion services which allows all women the opportunity to participate equally in the economic and social life of the United States.

154. Family Separation at the Southern Border
Student Presenter: David Carroll
Faculty Mentor(s): LaTasha Chaffin
Additional Authors: Jamison Dozier

One of the strongest bonds in humans is the connection we have with loved ones and family. The past decades, immigration at the Southern Border has grown and so has family separation problems. For example families with mixed legal status are in a situation where they may be deported while their child is left behind to fend for themselves. Different administrations, groups, and citizens all have differing ways of handling this situation. The question posed is how have these groups dealt with the problem and how these policies impact families. Policies such as the Immigration Act of 1990, U.S. Citizenship Act, or executive orders such as Protecting The United States From Foreign Terrorist and Other National Security and Public Safety Threats are just some examples. Examining these laws will give a look at how on paper these are taken out, but also by looking at news sources, and personal accounts of immigrants can the whole picture be seen. There will be opinionated policies presented throughout different administrations, a declining sense of moral duty to allow immigrants in, a growing amount of families separated because of these policies, and a large amount of young Americans who face the threat of their parents being stripped away from them. The separation of a child from their parent is horrendous, and the effects it has on a parent or child's mental state is nothing but destructive that will lead to only more problems down the road in every path possible including socially and economically.

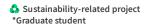## 155. Analysis of Recidivism in "Survival Crimes" focused on South Carolina
Student Presenter: Jack Collins
Faculty Mentor(s): LaTasha Chaffin
Additional Authors: Aidan Picca, Juanita Rodriguez, and Katie Fletcher

Recent studies have shown a mild decrease in recidivism within the United States, but the overall rate is still considerably high. Recidivism refers to the inclination of previously incarcerated individuals to re-offend. Contributing factors include lack of employment opportunities, housing instability, and limited access to mental health and addiction services. A margin of these crimes are committed out of necessity for the offender; this behavior is labeled survival crime. This is often due to poverty, homelessness, or addiction and is the primary source of income for offenders. The research question we propose is, do South Carolina state prison programs affect the recidivism of inmates who commit survival crimes? While conducting our research, we will analyze peer-reviewed articles, data published by nonprofit research organizations, and state legislation. Furthermore, we will conduct primary source interview(s) to expand our understanding from an eyewitness perspective. We expect to find that rehabilitation programs offered by the state of South Carolina are ineffective to an extent due to the still high recidivism rates. A further analysis will be conducted on recently established out-of-system reentry programs (primarily 501(c)(3) organizations) to determine if they have an alternative, more effective approach.

156. Family Separation
Student Presenter: Harley Dozier

Faculty Mentor(s): LaTasha Chaffin
Additional Authors: Keagan Carroll

How the US government handles family separation at the southern border has been a highly controversial issue, raising concerns about human rights and long term physiological consequences for affected families. While the Biden administration implemented measures to reunite families separated during the "zero tolerance" policy, the Trump administration's renewed focus on mass deportations threatens to disrupt thousands of immigrant families including the separation of mixed-status families and DACA recipients. This paper examines the latest immigration policies under Trump's administration, their implications for family unity, and the broader effects on immigrant communities living in the United States. By analyzing legal frameworks, enforcement strategies, and humanitarian concerns, we seek to understand how these policies will shape the future of immigration enforcement and family cohesion in the U.S.

157. The Effect of Tariffs on International Trade
Student Presenter: Jackson Gambrell
Faculty Mentor(s): LaTasha Chaffin
Additional Authors: Chase Bowers, Cecilia Marshall, and Josh Draper

One puzzling situation that has been occurring more recently is how tariffs are impacting international trade. Throughout recent history, tariffs have been used as a negotiation tactic to influence concessions of the country they are being imposed on. Previously, tariffs have been used to spur the American economy, but now they are being used to target specific nations to receive particular concessions. The research question we are analyzing is whether tariffs will affect international trade, and if so, how. We will gather research by analyzing current trade and tariff policy examples from the Biden and Trump administrations and understanding trade and tariff policy dating back to the nineteenth century. We expect to find that tariffs are a unique tool that will continue to adapt over time and throughout different presidential administrations. These tariffs affect our country's GDP and that of other countries as well.
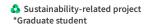
158. Advocacy 101
Student Presenter: Cadence Gillaspie
Faculty Mentor(s): Stephanie Visser

The purpose of this project was to connect as many College of Charleston students as possible to education on becoming advocates within their community. The Center for Civic Engagement recognized that students may have the motivation to become more engaged in their community's legislative process and other advocacy efforts but not know how to get started. This led to the creation of Advocacy 101: A Beginner's Guide to Civic Engagement. This guide aims to provide resources on media bias, what is on a ballot, how to engage with legislators, and contact information for local legislators. Alongside this book is an Advocacy 101 presentation expanding on the topics covered in the guide with different worksheets and videos. In addition, voter registration flyers for South Carolina and the leading home states of out-of-state students were created and distributed across campus. To engage students with these resources and prepare them for the 2024 General Election, different events were held throughout the Fall 2024 semester. These events included a National Voter Registration Day Party, a screening of the documentary Banned Together, a stamp drive in collaboration with the College of Charleston Mail Services for students mailing absentee ballots, and an early voting community walk. These efforts resulted in the registration of 896 students as voters. The resources created lay a foundation for a culture of community advocacy at the College of Charleston as they can be adapted and reused for future students and elections.

159. From Charleston to Cairo: Stories of Cultural Exchange ♻️
Student Presenter: Duaa Jamaluddin
Faculty Mentor(s): Lancie Affonso

In 2020, the College of Charleston and The American University in Cairo launched a transformative exchange program through the School of Languages, Cultures, and World Affairs. This initiative offers students from both

institutions the chance to explore the rich cultural and historical landscapes of Cairo and Charleston. The College Today has been instrumental in documenting these experiences, capturing the essence of the exchange. This exploratory project aims to highlight the program's significance through storytelling, including interviews with campus departments, alumni, and current participants. By using Artificial Intelligence, the project also seeks to customize personal narratives to uncover lesser-known aspects of the program, enhancing its visibility and impact. The goal is to create a meaningful narrative that underscores the program's value and fosters a deeper connection for future participants, bridging cultural gaps and enriching their educational journeys.

160. History of the Republic of Georgia ♻
Student Presenter: Oleksandr Koloskov
Faculty Mentor(s): John Thomas III

My research will focus on the Republic of Georgia from the late medieval period to modernity, with a primary emphasis on Russian influence-political, cultural, and sociological. Additionally, I will explore the nature and evolution of Georgian nationalism, a particularly intriguing phenomenon in a region shaped by diverse influences from Central Asia, the Arab world, and Europe. I will also draw comparisons with other countries in the Caucasus, as well as former Soviet republics, to provide a broader contextual analysis.

161. Impacts of Local Newspapers on Political Engagement ♻
Student Presenter: Erin Solka
Faculty Mentor(s): Lynne Ford

This study analyzes the effects of the presence, quality, and accessibility of local news sources on voter turnout in four counties in southern Texas. The investigation draws conclusions from literature about changes in communication strategies, trends toward the nationalization of American politics, and voter turnout data from the 2018 and 2022 midterm elections as a case study. The case study finds that when a county becomes a news desert, meaning that they are left with no local newspaper, voter turnout decreases. These findings are vital to the broader discussion about the role that the existing but declining local newspaper industry has on the American political system.

Department of Psychology

162. Mattering and Anti-Mattering in Emerging Adulthood: Associations with Family Chaos and Interpersonal Closeness
Student Presenter: Natalie Alexander
Faculty Mentor(s): Amy Kolak

Mattering, the feeling of being noticed, important, and relied upon, is a key predictor of meaning in life, particularly through interpersonal connections (Guthrie et al., 2024). In emerging adulthood, mattering may be especially important due to identity formation and peer relationships. A lack of calm, consistent family routines is associated with more behavioral problems in children and psychological distress in adolescents (Jaffee et al., 2012; Shelleby et al., 2014). Chaotic family environments can diminish feelings of mattering (Cookston et al., 2012), while young adults who recall a predictable family life tend to experience greater wellness and life satisfaction (Ross et al., 2022). This study examines associations among family chaos, mattering, anti-mattering, and interpersonal closeness in 290 college students (M = 18.74 years, SD = 0.89) recruited from psychology classes at a southeastern liberal arts college. Most participants identified as female (88.6%), reported living in two-parent households (77.6%), and had married parents (66.2%) at data collection. Subjects completed measures of family chaos, general mattering, anti-mattering, and interpersonal closeness. Bivariate correlations revealed that recollections of family chaos negatively correlated with general mattering (r = -0.42, p<.001) and positively correlated with anti-mattering

(r = 0.57, p<.001) and poor interpersonal closeness (r = 0.43, p<.001). Moreover, individuals who reported less interpersonal closeness reported lower levels of general mattering (r = -0.46, p<.001) and higher levels of anti-mattering (r = .37, p<.001). These findings shed light on factors that may affect young people's ability to connect with others.

163. Does Wording Affect Bond Court Decisions?
Student Presenter: Bella Burns
Faculty Mentor(s): Anthony Bishara

Once a person has been arrested and charged with a crime, they have to appear in bond court. This is where the judge decides whether to release the person from jail, release them with conditions (such as wearing an "ankle bracelet"), or keep them in jail until their main trial. Bond judges sometimes consider pretrial assessment instruments, statistical tools used to estimate a defendant's likelihood of returning to court for their main trial and likelihood to commit a crime before their main trial. We are conducting a survey that looks at the wording of these pretrial assessment instruments. Participants decide how strict or lenient to be when choosing a bond/pretrial decision for the hypothetical defendant. Some participants saw positively framed words ("how many succeeded"), whereas other participants saw negatively framed words ("how many failed"). Then some participants also saw the statistics describing the defendants as percentages (e.g., 90% of defendants), whereas other participants saw the statistics describing the defendants as frequencies (90 out of 100 defendants). Further, each participant was exposed to 4 risk levels in the descriptions of a hypothetical defendant ("this defendant is assessed as level 1"). Participants also decided whether they believed the wording was minimizing the risk, exaggerating the risk, and/or clear. Thus far, only risk level had a significant effect on bond/pretrial decisions, with participants making stricter decisions for higher risk level defendants. Data collection and analyses will be complete before this study is presented.

164. The Effect of Family Leisure Activities on Emerging Adults' Identity and Well-Being
Student Presenter: Maria Constant
Faculty Mentor(s): Amy Kolak

This study examined whether family cohesion and/or adaptability mediate the associations between core (i.e., everyday, inexpensive, home-based) and balance (i.e., less common, novel) family leisure activities and four outcome measures: positive affect, negative affect, self-concept clarity, and meaning in life. Participants included 193 Introduction to Psychological Science students at a mid-sized public liberal arts university in the Southeastern United States. Participants completed a Qualtrics survey which included an array of measures related to involvement in family leisure activities, family cohesion and adaptability, and individual well-being. Regression analyses revealed that family cohesion fully mediated the association between core leisure activities and emerging adults' negative affect, as well as the link between core leisure activities and individuals' self-concept clarity. Family cohesion was not found to mediate links between family leisure involvement and positive affect or meaning in life, balance leisure activities, along with family cohesion, were associated with experiencing greater meaning of life. These findings underscore the role that family leisure activities, especially core activities, and family cohesion play in shaping emerging adults' individual and emotional outcomes, with implications for future research on family dynamics.

165. Prisoner's Dilemma Simulation in Rats: Effects of Pay-Out Delay
Student Presenter: Meghan Dougherty
Faculty Mentor(s): Chad Galuska
Additional Authors: Gianna Incorvaia

The Prisoner's Dilemma (PD) is a classic game theory model utilized to study cooperation and defection. The PD and similar games have been thoroughly studied in humans with controlled experiments. The use of animal research allows researchers to study iterated forms of the game under more tightly controlled conditions with meaningful rewards. This study investigated the effects of delayed rewards on cooperative behavior in nine male Long Evans rats, using a computerized opponent programmed to utilize a "tit-for-tat" (TFT) strategy. Daily sessions

consisted of 4 forced-choice trials (where only one lever was inserted into the operant chamber) followed by 20 free-choice PD trials, each separated by a 5-s intertrial interval. At the beginning of each free-choice trial, two levers were inserted into the operant chamber. One lever was designated the "cooperation" lever, and the other lever was designated the "defection" lever. The computer played TFT, beginning with cooperation on Trial 1 and then choosing on Trial N what the rat chose on Trial N-1. The outcomes for the rat on Trial N were as follows. Mutual Cooperation (MC) produced 3 pellets, and Mutual Defection (MD) produced 1 pellet. Defecting when the computer cooperates (Temptation) produced 5 pellets. Cooperating when the computer defects (Sucker) produced no reward. Consistent with previous results, most rats repeatedly defected under this arrangement. By systematically delaying the reward for defection, the study aims to determine whether cooperation increases when incentives for defection are delayed.
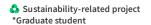
166. The Impact of Expressive Writing on Anxiety as a Function of Gender
Student Presenter: Ilari Droker
Faculty Mentor(s): Sarah Robertson

Expressive writing (EW) interventions have been demonstrated to have positive emotional and physical effects on people (Baikie et al., 2005). However, these effects can vary as a function of gender (Christiansen et al., 2022). The current study aimed to assess how different EW interventions are associated with the reduction of anxiety symptoms in college students. This study included first-year PSYC 103 students who attended the College of Charleston. There were 145 individuals who identified as female and 18 participants who identified as male. Participants were randomly assigned to one of three conditions: Traditional Expressive Writing (emotions related to coming to college), Enhanced Expressive Writing (writing about emotions and positive experiences in college) and the Non-Emotional Writing Task (objective description of an object or event). People wrote on three consecutive days and anxiety was measured at baseline, on each day of writing, and during a follow-up session. Anxiety was measured with the Beck Anxiety Inventory. It was hypothesized that women will have a more significant decrease in anxiety than men because of social roles and influences. A repeated measures analysis of variance was used to determine if a significant difference between both genders' anxiety levels existed. Results indicated that there was no significant difference between anxiety symptom change in females and males, however both genders' anxiety levels did significantly decrease over time. Future studies should work to attain an equal distribution of male and female participants.

167. Training and Data Judgment in the Challenger Disaster
Student Presenter: Alex Ford
Faculty Mentor(s): Anthony Bishara

On a frigid morning in 1986, the space shuttle Challenger exploded shortly after launch, killing all seven crewmembers. Engineers worried that sealing mechanisms in the rockets might fail at cold temperatures and struggled with whether to approve the launch. Eventually they did, perhaps due to two cognitive errors. Restriction of range refers to only analyzing a subset of all available data, leading to incorrect conclusions about the whole dataset. The feature presence effect is a bias wherein people pay more attention to the occurrence of events, rather than their absence. Engineers looked at data that included only previous flights with at least one seal failure when they recommended launch. By failing to consider data from flights without seal failures, they made a mistake that resulted in the deaths of seven people. Our research focuses on the self-reported lowest temperatures at which participants would recommend launch, disguised as a race-car scenario. Previous research found that participants given data with zero seal failures provided higher ‚Äòlowest temperatures' than those given data with at least one seal failure. The current studies provided training on these two biases to introductory psychology students through an online survey. Participants were randomly assigned to non-training control, restriction of range training, or feature presence training conditions. The training was theorized to increase their ‚Äòlowest temperatures.' Results indicate difficulty in training participants to reduce feature presence and restriction of range effects in temperature judgments, suggesting a need for better educational approaches to data judgment biases.

168. Learning Neuroanatomy by Assembling 3D-Printed Models
Student Presenter: Alena Gianoplus

Faculty Mentor(s): Nicholas Hindy
Additional Authors: Patrick Lezynski, Amanda Resendiz

Medial brain structures are crucial for understanding neural systems but are difficult to teach due to their spatial complexity. Traditional methods like dissection are effective but often inaccessible to undergraduates. This study examines whether active assembly of 3D-printed brain models improves learning outcomes compared to guided observation. Undergraduates in PSYC 214 and BIOL/PSYC 352 trained on 24 medial brain structure pairs (12 limbic, 12 sensorimotor) matched with functional descriptions (e.g., Amygdala and Stria Terminalis: "Sustain fear"). Training was counterbalanced: in active assembly, students built the models; in guided observation, they watched instructional videos. After assembly, students photographed their models. Two days later, they completed free recall, multiple-choice recognition, and function identification tests. Photographs were scored for placement and orientation accuracy, and surveys captured students' perceptions. Surveys showed a strong preference for active assembly: 25/32 PSYC 214 students and 9/14 BIOL/PSYC 352 students found it more helpful for identifying brain structures, compared to just one student per class favoring guided observation. Preliminary memory tests indicated slightly higher multiple-choice recognition accuracy for active assembly, while free recall accuracy was low (~15%). Correctly placed structures were significantly more likely to be recognized in the multiple-choice test. Active assembly offers a hands-on approach to neuroanatomy education, paralleling the benefits of dissection while improving accessibility. By integrating functional relationships into learning, this method enhances spatial reasoning and engagement, demonstrating its potential as an effective alternative to traditional neuroanatomy labs.

169. Intrinsic and Extrinsic Motivations and Their Effect on Resurgence ♻
Student Presenter: Natalia Halachev
Faculty Mentor(s): John Widholm
Additional Authors: Maliyah Houston

Behavioral resurgence refers to the recovery of prior behavior caused by the removal of reinforcement alternatives. The study of this phenomenon has therapeutic implications for understanding the relapse of unwanted/inappropriate behaviors. One apparent limitation in the resurgence literature has been the exclusive use of extrinsically motivated behaviors to evaluate the underlying variables of the phenomenon. The purpose of the current study was to determine whether differences in resurgence are observed when alternative behaviors differ in terms of intrinsic versus extrinsic motivations. Sixteen rats (8 males and 8 females) will be tested daily (7 days a week) in automated operant chambers in which lever pressing is reinforced as the target behavior on a VI-15" schedule. Once obtained, lever-pressing will be placed under conditions of extinction, and wheel running (Lever-Wheel, N=8; intrinsically motivated) or chain pulling (Lever-Chain, N=8; extrinsically motivated) will be reinforced (VI-15") as alternative sources of reinforcement for ten straight sessions. Then, the alternative behaviors will (also) be placed under conditions of extinction for three consecutive sessions, and target behavior emission will be recorded. It is hypothesized that the intrinsically motivated alternative behavior of wheel running will result in lower levels of target behavior resurgence compared to the extrinsically motivated alternative behavior of chain pulling. The current procedure has the potential to reveal limitations in the resurgence literature and has implications for the use of intrinsically motivated behaviors as therapeutic interventions to minimize the resurgence of maladaptive and/or unwanted behaviors.

170. Effects of Alcohol and Cannabidiol (CBD) on the Nervous System
Student Presenter: Natalia Halachev
Faculty Mentor(s): Jenn Wilhelm
Additional Authors: Grace Dorion, Marley Leventis, Payton Reuss, Em Weimer, Alena Gianoplus, Reagan White, Kennedy Camburn, Emily Russell, Emma Angelo, Liana Brock, Izabella Bateman

The use of cannabidiol (CBD) has increased significantly in recent years, yet the interaction between CBD and other substances remains poorly understood. CBD is often marketed as a wellness product that may reduce some of alcohol's harmful effects, making the study of their combined effects relevant to human health outcomes. This study investigated how CBD and ethanol, both independently and in combination, affect planarian motility. It was hypothesized that ethanol would decrease planarian motility while CBD would increase it and that their

combination would produce differential effects compared to the control condition. Planaria were randomly assigned to four treatment groups (control, ethanol, CBD, or combined condition), and their motility was measured. Our results revealed no significant differences in motility between any of the treatment conditions. These findings contrasted with previous research that demonstrated the effects of these substances on planarian behavior. Possible explanations for contradictory findings may stem from various methodological decisions, such as the concentration levels of substances that were used or substance exposure lengths. Further research should be conducted to understand the interaction between these substances better.

171. The Relationship Between Adverse Childhood Effects and Parent-Child Conflict Tactics
Student Presenter: Olivia Hawk
Faculty Mentor(s): Grace Hubel
Additional Authors: Hannah Strauss

The objective of this study was to understand relationships between adverse childhood experiences (ACEs) of parents and their later self-regulation, parenting stress, and parenting practices. A representative sample of mothers with children 5 and younger (N=572) completed the Adverse Childhood Experiences Questionnaire, which asks about child abuse, growing up with household dysfunction, and experiences of community adversity such as neighborhood violence; the Parenting Stress Index-Short Form, which asks about stress due to the parenting role and parent-child interactions; the Promotion/Prevention Regulatory Focus scale, which assesses tendencies towards promoting positive outcomes and towards preventing negative outcomes; and the Parent-Child Conflict Tactics Scale, a commonly used parent self-report measure of parent-child conflict management strategies, including harsh discipline practices indicative of physical and psychological abuse. Linear regressions were conducted with ACEs of parents as the predictor of parenting stress, promotion and prevention regulatory focus, and severity of harsh parent-child conflict tactics. Results indicated that ACEs were a significant predictor of higher levels of parenting stress, greater tendency to engage in prevention regulatory focus (i.e., focus on preventing negative outcomes), and greater severity of harsh parent-child conflict tactics. The presentation will include discussion of implications of the results in terms of intervening with parents exposed to ACEs to reduce stress and improve self-regulation, which may help prevent development of harsh parent-child conflict tactics.

172. The High Cost of Poverty: How Family Unpredictability Moderates the Relationship between Socioeconomic Status and Depression ♻
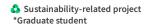**Student Presenter: Kouta Hernandez**
Faculty Mentor(s): Lisa Ross

For college students, depression can be detrimental to achieving academic success. Eisenberg et al. (2007) found that 44.3% of students reported their mental health had impaired their academic performance during the previous month. Considering the age of students entering college, it is possible that pre-college life experiences can put them at risk for depression. Findings by Garc√≠a-Vel√°zquez et al. (2021) tell us that there was a higher rate of depression, along with a more disabling effect among socioeconomically disadvantaged groups. Ross et al. (2016) found college student recollections of family unpredictability correlated with childhood depression estimates as well as recent symptoms. This study is interested in seeing if the relationship between socioeconomic status (SES) and depression is moderated by family unpredictability. The study will use stepwise multiple regression to conduct a moderation analysis, using available data collected from 185 undergraduates (84% of whom are 18 and 19 years old). The first hypothesis is that all variables (SES, family unpredictability, and depression) are correlated. The second hypothesis is that family unpredictability moderates the relationship between SES and depression. The implications of this study could help guide young adults interested in starting families on the importance of maintaining stability in the home. The study's findings could also help those affected by a history of poverty or family unpredictability cope with these risk factors.

173. Interneuronal Expression of Cocaine-Seeking Rodents in the Nucleus Accumbens following Withdrawals
Student Presenter: Natalie Hodak
Faculty Mentor(s): Nicholas Hindy
Additional Authors: Michael Scofield, Medical University of South Carolina

Cocaine-use disorder affects over 1.5 million people across the United States. One of the main reasons as to why cocaine use disorders are so dangerous and hard to treat is due to relapse after withdrawals. The nucleus accumbens is the part of the brain associated with the reward effects of substance use, which makes it particularly significant in drug addiction and substance use disorders research. Likewise, it can be difficult to create treatments for substance use disorders because of the similarities in reward response for foods, more specifically those high in sugar, which if also eliminated, would be an unintended consequence of the treatment. The results of previous studies on animal models (rodents) indicate that relapse after withdrawals occurs because of the release of glutamate, which interacts with neuronal nitric oxide synthase (nNOS) and expresses interneuronal activity. The goal of this study is to differentiate the glutamate release and therefore interneuronal activity between cocaine-seeking rodents and sucrose-seeking rodents following a period of withdrawals to discover a potential difference in rodent's seeking behaviors between the cocaine and sucrose. The data collection is currently incomplete and ongoing; however, it is expected that the results will present greater amounts of interneuronal expression in the nucleus accumbens for the rodents that are given the cocaine virus. If this prediction is met, it will provide a foundation for further substance use research to build upon, especially for producing effective treatments to reduce the likelihood of relapse with limited unintended consequences.
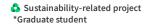
174. Cultivating Self-Compassion and Community Support for Autistic Adults
Student Presenter: Laura Jacobs
Faculty Mentor(s): Lisa Ross

Our developing understanding of neurodiversity has resulted in a significant growth in the percentage of children who are diagnosed with autism. Autism is a lifelong state of being, yet there is minimal consideration for persons diagnosed in childhood once they reach adulthood. Furthermore, there is relatively little research being conducted on adults on the autism spectrum who are undiagnosed. The mental health system and our social infrastructure are not readily equipped to meet the needs of autistic adults. This disparity leaves the substantial autistic community without accessible means to mental well-being. This presentation examines the lack of information and support available, as well as emerging modalities to promote mental health in autistic adults. Methods for autistic individuals to engage in self-compassion will be discussed, as will opportunities for loved ones, the healthcare system, and the public sector to be more aware and supportive of our autistic communities.

175. The Effects of Expressive Writing on General Anxiety Levels in Undergraduate Students
Student Presenter: Oak Juneau
Faculty Mentor(s): Sarah Robertson

Expressive writing (EW) is a therapeutic approach involving reflecting on emotions and experiences in written form. Prior studies have shown that EW can alleviate symptoms of anxiety and improve psychological well-being by enhancing emotional regulation and reducing stress across several domains (Guo, 2022; Tang & Ryan, 2020; Shen et al., 2018; Doherty & Wenderoth, 2017; Yu & Zhang, 2022). This study aimed to evaluate the effect of expressive writing interventions on general anxiety levels in undergraduate students. A randomized controlled design was employed, with participants randomly assigned to Traditional Expressive Writing (participants wrote for 20 minutes about their deepest thoughts and emotions regarding their transition to college), Enhanced Expressive Writing (same procedure as TEW, but additions were made to the writing task for each intervention, such as writing about something positive, changes to be made, etc.), or Non-Emotional Writing (participants described an object or event objectively, avoiding emotions, opinions, or beliefs) groups. Over three days, participants engaged in 20-minute writing tasks, followed by various assessments of anxiety (Beck Anxiety Inventory) and depression (Beck Depression Inventory-II). Follow-up measures were collected one week and one month post-intervention. Anxiety levels significantly decreased across all intervention groups. These findings suggest that expressive writing and non-emotional writing may benefit some individuals in managing and reducing anxiety. It warrants further investigation to establish its efficacy under different contexts or with larger sample sizes.

176. Adults' Perceptions of Children's Disclosures of Maltreatment During Conversations with Parents: Effects of Expert Testimony

Student Presenter: Madeline Keller
Faculty Mentor(s): Gabrielle Principe
Additional Authors: Marley Leventis and Natalia Halachev

Forensic interviews can pose immense challenges, especially when involving children. In most child maltreatment cases, such as those involving allegations of sexual abuse (SA), children's testimony serves as the sole piece of evidence. Allegations of SA often arise in conversations between children and parents, before they are brought up legally. However, these conversations can intrude into children's later independent accounts and lead children to make novel reports of events that never happened. This is because false, suggestive information, unwittingly incorporated into parents' questions, can lead to false accounts as elaborate and compelling as true ones. Understanding professional laypeople's perceptions of this parental influence is paramount to arriving at accurate and just conclusions in legal cases involving young witnesses. In this study, we extend prior work by examining whether adults can discern when a parent uses a suggestive questioning style by using expert testimonies that can either promote or distort children's memories. Participants read dialogues modeled after those in real cases where a child makes a singular disclosure of SA to a parent. We varied whether participants received expert testimony or not, the degree of the parent's suggestibility (highly suggestive versus moderately suggestive versus nonsuggestive), and the age of the child (4- versus 10-year-old). Of particular interest is the degree to which the expert testimony on children's memory and suggestibility can help adults distinguish between suggestive and nonsuggestive parent questioning. Our findings will have implications for children's treatment in legal cases involving allegations of maltreatment.

177. Investigating the Impact of Coaching on Parents' Questioning and Children's Event Reports
Student Presenter: Diana Kenes
Faculty Mentor(s): Gabrielle Principe
Additional Authors: Sophia Brown, Tyler Cooper, Ella Dachsteiner, Megan Foster, Rebecca Grosso, Phoebe Proctor, Sara Roboyo, Maggie Smith, Sia Sharma, Eleanor Williams

Investigations of child sexual abuse are particularly challenging because corroborating medical or physical evidence often is lacking. Consequently, children's statements usually are the only evidence for judging the occurrence of sexual abuse. Most suspicions of child sexual abuse arise during interactions with a non-offending parent. However, in both every day and abuse disclosure conversations, parents are prone to use suggestive questioning to elicit their children's reports - the very techniques that forensic interviewers are taught to avoid because of their likelihood to produce false accounts. Thus, an important issue for researchers is examining ways to reduce parental suggestiveness in forensically relevant conversations and protecting the reliability of children's statements. In this study, we test the effectiveness of an intervention aimed at reducing parents' suggestive questioning and increasing their reliance on open-ended probes when talking with their children about a past experience. This intervention is based on studies that have revealed the questioning techniques that produce the most complete narratives from children while minimizing errors. To examine the effectiveness of this intervention, parents question their children about an earlier event. Following the event, some parents receive misinformation about what their children experienced, whereas others receive no information. Within each information group, some parents receive training on how to avoid suggestive questions and privilege open-ended invitations to increase children's accuracy. Then parents question their children about what happened during the earlier event. Finally, children are given a forensic interview to assess their memory of the event and determine the effectiveness of our intervention.

178. Assessing Transfer of Function in the Absence of Testing for Derived Stimulus Relations
Student Presenter: Diana Kiger
Faculty Mentor(s): Adam Doughty
Additional Authors: Janet I. Nash

Derived relational learning is when organisms learn to relate physically dissimilar items without direct training. A property of derived relational learning is transfer of function (ToF). ToF occurs when the function of one stimulus in a derived relation alters the function of another stimulus in that relation, without additional training. For

example, when tested a research participant may derive a relation between B and C because B and C have been directly trained with A. If B then acquires a stimulus function through direct training, C may indirectly acquire that function. The variables that control ToF remain unclear. Our recent research has examined the role of prior testing for derived relational learning. In the previous example, would reliable ToF occur if the derived BC relation was never tested? In Study 1, college students were exposed to the ToF manipulation prior to learning the baseline stimulus relations. In Study 2, different college students were exposed to the ToF manipulation both before and after they learned the baseline stimulus relations. In both studies, reliable ToF was not obtained, due to the absence of testing for the derived relations. These findings are consistent with the argument that robust ToF requires prior derived-relations testing. The results are important because ToF has been implicated as a key determinant for generative learning in humans (i.e., human language and cognition). As such, it is critical that investigators isolate the necessary and sufficient conditions that control ToF.

179. An interactive 3D atlas of white matter in the human brain
Student Presenter: Alton McCurry
Faculty Mentor(s): Nicholas Hindy
Additional Authors: Henry Horschman, Oak Juneau, and Nicholas Hindy

This project aims to create a 3D atlas of white matter connections within the human brain for research and educational purposes. The white matter tracts in the human brain consist of myelinated nerve fibers that facilitate communication and connection between various gray matter structures. Diffusion Tensor Imaging (DTI) enables visualization of these tracts by analyzing the movement of water molecules within brain tissue. Despite their critical role in processing and communicating information within the brain, undergraduate neuroscience education tends to overlook white matter tracts. By integrating the study of white matter tracts into the neuroscience curriculum, students will be better equipped to interpret fMRI findings and neural disorders related to brain connectivity. We aim to create a visual atlas of 83 white matter tracts and their associated structures that are all registered to a standard MNI template. The tracts are categorized into four groups: projection tracts, association tracts, cerebellar tracts, and cranial nerves. The raw tractography was developed by Yeh (2022, Nature Communications) and is based on average DTI datasets from 1,065 participants in the Human Connectome Project. Using advanced graphical software tools, we are producing precise and accurate 3D visualizations of white matter tracts. The 3D models of the white-matter tracts will be incorporated into an interactive graphical software system for visualizing neuroanatomy. By creating an accurate and interactive 3D atlas of all white matter tracts in the brain, we aim to advance neuroscience research and undergraduate education.

180. From Isolation to Networks: Assembling 3D-Printed Models of Brain Connectivity
Student Presenter: Kai McKoy
Faculty Mentor(s): Nicholas Hindy
Additional Authors: Emily Burke

Traditional neuroanatomy education often isolates brain structures, resulting in fragmented knowledge and poor retention of functionality. Modern advances in neuroscience, particularly diffusion tensor imaging (DTI), highlight the significance of neural connectivity; however, these insights are still underutilized in undergraduate neuroscience courses. This study investigates whether focusing on the functions of interconnected brain structures improves learning outcomes compared to studying the functions of individual structures. Prior research indicates that instruction based on connectivity leads to enhanced learning compared to instruction focused solely on individual structures. Building on these previous experiments, this study involves 4 white-matter tracts and 8 gray-matter structures. Students will learn about four different networks: auditory, limbic, motor, and visual by assembling neural networks from 3D-printed brain parts at the same time that they use an interactive software program Show Me the Brain!! (SMtB) to visualize neural pathways. Data will be collected from two neuroscience courses at CofC: a lower-level course, Behavioral Neuroscience (PSYC 214), and an upper-level course, Systems and Integrative Neuroscience (BIOL/PSYC 352). Students will assemble 3D-printed brain parts that are either connected into a network or left unconnected. After the lab, participants will complete a long-term memory follow-up two days later. Two potential outcomes can be expected from this study: students may show similar learning outcomes in both connectivity-based instruction and independent structure instruction, or students who learn

under connectivity-based instruction may outperform those in independent structure instruction. Findings will inform research incorporating DTI visualization to improve neuroanatomy learning and comprehension.

181. Drawing White Matter Tracts to Learn Gray Matter Structures
Student Presenter: Amanda Metenosky
Faculty Mentor(s): Nicholas Hindy
Additional Authors: Oak Juneau

This study examines whether drawing white matter tracts that connect gray matter structures enhances neuroanatomy learning. Undergraduate neuroscience traditionally focuses on the functions of individual gray matter structures but not on the white matter tracts that connect them. Previous studies reveal that active engagement through drawing is an effective way to learn about individual brain structures. Can drawing be even more effective when white matter tracts link gray matter structures to one another? In a within-subjects online study, 50 participants recruited via Prolific will complete a Qualtrics experiment consisting of training and memory test phases. In the training phase, participants will engage in two conditions: (1) a control condition, where they trace two gray matter structures and a white matter tract individually, learning their separate functions, and (2) a connected condition, where they trace a continuous network of two gray matter structures and a white matter tract, learning the interconnected function of the triad. Structures will be highlighted and labeled with their respective functions. In the second part of the training, participants will complete a memory test where all structures remain visible but unhighlighted, requiring them to outline the structures without guidance. Follow-up memory tests days later will include drawing from memory or labeling brain structures. Results will indicate whether integrating white matter tracts into neuroanatomy learning enhances recall and understanding of individual structures versus entire functional networks.

182. The Association Between Word Choice and Symptom Reduction in Expressive Writing
Student Presenter: Gaetina Milbradt
Faculty Mentor(s): Sarah Robertson

Expressive writing is a therapeutic method addressing traumatic, stressful, or emotional events, often enhancing physical and emotional health. Several studies indicate that writing positively enhances emotional well-being. The current study aims to assess the effects of expressive writing interventions on first-year college students' emotional health, explicitly measuring how the use of positive versus negative language can be associated with symptom reduction. After completing self-report measures [Demographic Questionnaire, the Beck Depression Inventory-II, the Beck Anxiety Inventory, the SF-36 Medical Outcomes Questionnaire, the Student Adaptation to College Questionnaire (SACQ), Health Visit Questionnaire, and the Multidimensional Scale of Perceived Social Support)], 168 incoming college students were randomly assigned to either Traditional Expressive Writing (writing about their deepest thoughts and feelings about coming to college), Enhanced Expressive Writing (writing about enhancing their college experience and positive aspects about transitioning to college), or Non-Emotional Writing (writing about any object or event) groups. Participants completed three consecutive days of writing and two follow-up visits. Physical and emotional health were measured at each study visit with the Beck Depression Inventory, the Beck Anxiety Inventory, and the Health Visit Questionnaire. All the questionnaires were completed again at the end of the study and the follow-up sessions. Data has been collected, but analyses have not been completed. Analyses will begin in February and be ready by April.

183. Assessing the Effects of a None Option on Transfer of Function
Student Presenter: Janet Nash
Faculty Mentor(s): Adam Doughty

If a child is directly taught that the fraction ½ (A) is identical to the decimal 0.5 (B) and to a half-colored pie chart (C), they may derive the BC relation on their own. If the child then is taught to say "half" when seeing the half-colored circle, they may without additional training say "half" to the decimal. The latter outcome is an example of transfer of function (TOF). The necessary and sufficient conditions that establish TOF remain unclear. This experiment investigates whether including a None of the above option in baseline learning (AB, BC, CD) enhances

subsequent TOF. Two groups of participants will learn baseline relations with or without the None option. Both groups then will learn new relations between the D stimuli and three stimuli varying in length (D1: choose short, D2: choose medium, D3: choose long). The research question is whether participants will show TOF with the A stimuli (A1; choose short; A2: choose medium; A3: choose long) despite the absence of relational testing between the A and D stimuli. The results will be analyzed in the context of whether and how the None option facilitates derived relational learning to promote TOF despite the absence of relational testing.

184. Effects of Poly-Psychoactive Substance Use on The Nervous System
Student Presenter: Audrey Ogburn
Faculty Mentor(s): Jennifer Wilhelm
Additional Authors: Brooke Cameron, Elijah Covington, Ainslei Fallaw, Madeline Keller, Sarah Jane Kurzenberger, Alton McCurry, Amanda Metenosky, Lauren Poliseno, Brenden Ross, Marta Sanchez Avendano, MK Talledo, and Emily Clay Weinmann

Nicotine, alcohol, caffeine, and Δ-8-tetrahydrocannabinol are psychoactive substances commonly used for recreational purposes in the United States. While the effects of these substances used individually have been well studied, not as much is known about the effects of these substances used in combination. This study aims to examine the effects of single versus polysubstance use on the nervous system using planaria as a model organism. Planaria (N= 54; n=6 per group) were randomly assigned to one of the following treatment groups: 1) spring water; 2) nicotine; 3) caffeine; 4) ethanol; 5) Δ-8-THC; 6) caffeine and nicotine; 7) caffeine and ethanol; 8) nicotine and ethanol; or 9) Δ-8-THC and ethanol. Planaria were placed in petri dishes with a 1 mm x 1 mm grid underneath and were treated with the psychoactive substance(s) for at least 5 minutes. Changes in the activation of the nervous system were assessed by monitoring changes in the planaria's motility. This was quantified by counting the number of grid lines that the planaria crossed or recrossed during a 2-minute period. Preliminary analysis found a statistically significant main effect of treatment. Our statistical analysis is ongoing. This study will contribute to neuroscience literature by providing a basic understanding of how the nervous system reacts to the combined usage of common psychoactive substances.

185. How Accessible Are Our Campus Buildings? ♻
Student Presenter: Kadie Overby
Faculty Mentor(s): Lancie Affonso

This project aims to assess and improve accessibility within the College of Charleston and the surrounding community, specifically in building access. By identifying both barriers and existing solutions, it seeks to promote inclusivity and provide resources for individuals facing accessibility challenges. Inaccessible environments often lead to stress and feelings of exclusion. Understanding the community's perspective on accessibility is crucial for developing effective solutions. This project will focus on key areas across campus to pinpoint space for improvement while also highlighting the ongoing initiatives set in place for a more inclusive environment. Ultimately, this project is designed to spark ongoing conversations about the importance of continuous improvements in accessibility. Enhancing accessibility can reduce mental health concerns, boost student involvement and academic success, and improve the quality of life for everyone in the community.

186. Effect Of Parent Mental Health on Learned Skills In Tele-PCIT For Children With Neurodevelopmental Disorders
Student Presenter: Taleen Pratt
Faculty Mentor(s): Alexandra Marsden

Parent-Child Interaction Therapy (PCIT) facilitates improvements in child behavior by teaching parents "Do" and "Don't" skills focused on positive communication and consistent discipline. While PCIT has been implemented for children with neurodevelopmental disorders, parents of these children have higher rates of mental health diagnoses, creating a need to explore whether parental diagnosis predicts success in therapeutic outcomes. This study examines improvements in parental use of "Do" and "Don't" skills after PCIT and whether parent diagnoses (ADHD, depression, anxiety) predict parenting outcomes. Participants included 65 children (Mage=4.98) with a neurodevelopmental diagnosis and elevated disruptive behaviors. Families received a time-limited, telehealth

version of PCIT. Parents self-reported on their diagnostic history. Parent-child play observations at pre- and post-treatment were coded using the Dyadic Parent-Child Interaction Coding System. After PCIT, parents significantly increased "Do" skills (t = 10.98, p < .001) and decreased "Don't" skills (t = 7.74, p < .001). Parents with ADHD did not differ from parents without ADHD in increases in "Do" skills, $F(1,43)=.21$, p=.65, or decreases in "Don't" skills, $F(1,43)=2.73$, p=.12. Parents with depression did not differ from parents without depression in improvements in "Do" skills, $F(1,43)=.75$, p=.39, or "Don't" skills, $F(1,43)=.03$, p=.86. Parents with anxiety did not differ from parents without anxiety in improvements in "Do" skills, $F(1,43)=.47$, p=.50, or "Don't" skills, $F(1,43)=.39$, p=.54. Significant improvements in learned skills were consistent, highlighting PCIT as a robust intervention for parents with mental health challenges. Findings serve as a basis for future studies on benefits and predictors of treatment success.

187. Resurgence of Transfer of Function
Student Presenter: Morgan Treadwell
Faculty Mentor(s): Adam Doughty

Derived relational learning refers to the emergence of an untrained association acquired from the coupling of stimuli connected through a prior reinforcement pattern. The transfer of stimulus functions (TOF) occurs when the role of one class member in a derived relation alters the function of another independent of additional training. The ability to facilitate a functional transfer illuminates the interplay between experience and relational learning while extending our conception of behavioral adaptability. Resurgence occurs when modified relational demands disrupt current contingencies and resurrect previously reinforced response patterns. The recoverability of learning established through a derived relational network has yet to be adequately explored. The current study will clarify the conditions that govern resurgence in relation to TOF by examining the role of testing as a key catalyst for behavioral change. In Phase 1, college students received arbitrary matching to sample training that resulted in four, 3-member stimulus-equivalence classes. One group of participants then underwent a TOF manipulation and test, whereas a second group only received the TOF manipulation. In Phase 2, participants learned alternative discriminations using the original stimuli. Following TOF probes, TOF resurgence will be assessed in both groups of participants. The findings will be discussed in the context of resurgence and the necessary experiences that establish TOF.

188. Comparing behavioral variability and repetition: Reviewing the role of the Repeat sequence
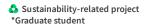**Student Presenter: Joshua Watford**
Faculty Mentor(s): Adam Doughty
Additional Authors: Lauren E. Motta, Morgan C. Treadwell

Reinforcement is a process whereby behavior is strengthened by its consequences. Reinforcement typically results in behavioral repetition in that the consequence increases the likelihood of the preceding behavior. However, reinforcement also can establish behavioral variability in that organisms learn that an important consequence only follows non-repetition. Several studies have compared the properties of behavioral variability and repetition. This literature review analyzes that literature, focusing on the selection of the Repeat sequence. We searched databases including PsycINFO, EBSCOhost, and Google Scholar, and the reference sections of relevant papers. Fourteen studies met the inclusion criteria. The data elements extracted for the purpose of the review included participant population, research purpose, repeat sequence(s), repeat sequence reinforcer probability, type of variation contingency, and the dependent measures used to characterize successful repeating and varying. Through an analysis of these elements, this review helps (a) identify gaps in our knowledge base, (b) avoid redundancy in experiments, (c) enable critical evaluation of methodology, and (d) future researchers formulate their research questions. Our most impactful conclusion is that future research must consider a broader range of Repeat sequences, particularly those sequences with an end switch and those sequences with zero switches. The inclusion of this diversity in Repeat sequences will deepen our understanding of how, and to what extent, reinforcement establishes strong variable and repetitive response patterns.

189. Impact of Socio-Economic-Status on Self-Regulation and Focused Attention in Infants/Toddlers
Student Presenter: Reagan White
Faculty Mentor(s): Michael Ruscio

♻ Sustainability-related project
*Graduate student

Additional Authors: Lia Hansen, Annika Wienke (University Bremen), Birgit Mathes (University Bremen)

In Germany, the current study examined how SES factors affect childhood cognitive development. Two facets of childhood development that have yet to be linked to the specific facets of SES is the development of self-regulation (SR) and focused control (FC). The specific SES risk levels were defined using parental migration status and parental education level. The cookie task is a way to measure the development of SR in young populations (below 3 years), similar to the famous marshmallow task. Data analysis showed that the 'children of highly educated migrants' group showed the best level of self-regulation. The lowest level of SR was found among medium risk children. The "high risk" group, low education + a migrant parent, also showed low latency, but not as much as the medium risk group. Surprisingly, the "low risk", high education + native German parents, had worse SR than the medium risk group. The ability for children to engage in focused attention (FA) and ignore six distractors is a precursor to efficient cognitive development. Research has shown that SES level can elicit external risk factors that interfere with appropriate attentional development. The play task has four trials which enable the measurement of FA and distractibility in a controlled environment using audio-visual distractors. In Trials 3 and 4, the medium risk group had significantly higher FA than the high risk group. In Trial 4, gaze duration towards the sixth distractor was significantly longer in the high risk group than the medium risk group.

190. Remembering the Relationship Events and Experiences
Student Presenter: Jamie Wirth
Faculty Mentor(s): Chelsea Reid

This study investigated the potential of nostalgia to serve as a coping mechanism for individuals who have experienced a transgression in their romantic relationships. This research aims to understand the characteristics of nostalgia experienced while reflecting on both adverse and ordinary relationship events, examining its potential as a possible resource for coping with transgressions in romantic relationships. Individuals were eligible to participate in the study if they were at least 18 years old, were located in the United States, and were currently involved in a romantic relationship of at least 6 months. Participants were recruited from Prolific and were asked to complete a survey online. A series of independent samples t-tests were performed for a between-subjects design to determine whether romantic nostalgia can result in higher levels of forgiveness for relationship transgressions, level of forgiveness, relationship satisfaction, affective attraction, relationship flourishing, inclusion of other self, gratitude, and couples satisfaction. I hypothesized that engaging in memory of relationship nostalgia after recalling a partner's transgression will reduce negative responses (e.g., decline in relationship quality) and increase positive outlooks (e.g., increase self-esteem, foster social connectedness, and alleviate threatened feelings) on their romantic relationship compared to recalling an ordinary relationship event.

Department of Religious Studies

191. Civil Religion in the 2025 US Presidential Inauguration
Student Presenter: Thomas Atkinson
Faculty Mentor(s): Elijah Siegler

In the decades following the publication of Robert Bellah's 1967 essay: "Civil Religion in America," scholars have continually contested the concept of American civil religion. American civil religion, generally, is a sociological theory that the United States has a non-sectarian civil religion made up of rituals, symbols, and beliefs which exists parallel to traditional religious affiliations. In the spirit of Bellah, who analyzed the inaugural address of President Kennedy, I analyze the second inaugural address of President Trump using competing theories of American civil religion. In addition to this, I also compare President Trump's second inaugural address to his first inaugural address and President Biden's 2021 address in order to understand how American civil religion has changed over the past decade. Based on these analyses, I argue that American civil religion has shifted from a position of prophetic republicanism toward a more illiberal secular nationalist position, as described by Phillip Gorski in

American Covenant (2017) and American Babylon (2021). American civil religion is not a static concept but a dynamic one that continues to have a powerful influence over American political thought and practice.

192. Tracing the Roots of Indigenous Colonization, Conversion, and Cultural Appropriation ♻
Student Presenter: Katherine Iris Geils
Faculty Mentor(s): Brennan Keegan

This EXPO poster will (1) consider the top-down appropriation of European Indigenous practices as a means of spreading Christianity throughout the Roman Empire and in the Middle Ages' Western Europe, as well as the bottom-up assimilation of Indigenous European pagans to Christianity as a means of cultural and religious survival. In order to (2) compare this same dynamic of religious appropriation and conversion of enslaved Africans and dispossessed Native Americans. In comparing the colonization practices enforced upon Indigenous Europeans, Indigenous Africans, and Indigenous Native Americans, this EXPO poster hopes (3) to address questions around modern-day cultural appropriation with a historical context that goes beyond the often-limited context of the Americas. By tracing the historical roots of appropriation, this EXPO poster will seek to answer: how should Euro-Americans as descendants of Indigenous Europeans and arduous perpetrators of colonization position themselves in conversations around cultural appropriation? Ultimately, considering Indigenous Europeans' role as historical victims of colonization, who likewise adopted religious forms and expressions of Christianity, could contribute to a larger understanding of modern cultural appropriation in the context of globalization. In some ways, this EXPO poster hopes to complicate the contemporary conversations around cultural appropriation in order to highlight the agency of colonized peoples in appropriating the religious forms of their colonizers.

193. POLARITIES OF THE SACRED: RACE AND CLASS, VICE AND VIRTUE IN CHARLESTON'S FOURTH WARD
Student Presenter: Christian Wright
Faculty Mentor(s): Lenny Lowe

Charleston's Fourth Ward exists at the intersection of the sacred and profane, where brothels and churches coexisted, shaping a complex cultural landscape. This study challenges conventional historical narratives by examining how marginalized spaces,Äîsites of vice and virtue,Äîparticipated in the city's moral and economic life. Drawing on Robert Hertz's theory of sacred polarity and Georges Bataille's concept of excess, this work argues that brothels, much like churches, functioned as sacred spaces, defined by ritual, social boundaries, and collective attention. The Fourth Ward emerges as a contested space where racial, economic, and gendered hierarchies were both reinforced and subverted. By interrogating these spaces as interconnected rather than oppositional, this study disrupts traditional binaries of morality and deviance. If the sacred is not simply what is revered but also what is set apart, then what does it reveal about society that the most policed and condemned spaces are often those of the most intense human desire?

Department of Sociology and Anthropology

194. Evolutionary Theory: An Evolutionary Perspective on Mythology as a Mechanism For Cultural Transmission
Student Presenter: Reece Boan
Faculty Mentor(s): Hector Qirko

This research analyzes mythology as an evolutionary mechanism for cultural transmission, social cohesion, and behavior adaptations. Combining perspectives from evolutionary psychology and anthropology, this study looks at how stories from mythology are used as an evolutionary tool for transmitting culture in a society. By applying meta-analytical research techniques, mythology was found to be a key evolutionary tool in multiple ways. It strengthens social unity by reinforcing shared values and cooperation, provides a strong base for understanding complex environments, enhances survival strategies, and reinforces social norms. The findings suggest that

♻ Sustainability-related project
*Graduate student

mythology serves both social and cognitive functions, aiding in decision-making, problem-solving, and cultural identity formation while enhancing cooperation and collective resilience. By viewing mythology as an evolutionary tool, this study shows its role as a fundamental cultural practice that has aided in human survival throughout history.

195. The Mind-Body Connection: Exploring how health-related habits and behaviors are perceived to impact the mental health of college student-athletes
Student Presenter: Emma Appleman
Faculty Mentor(s): Sarah Hatteberg

Research indicates that athletic participation can have physical and mental health benefits, however, athletes also face stressors that may undermine those health benefits of sports participation. For example, studies indicate that beyond facing role-related pressures and obligations, athletes may adopt poor health habits/behaviors (e.g., lack of sleep, poor nutrition, an overreliance on caffeine etc.) in their efforts to cope with role demands. Given the limited research into athletes' perceptions of a mind-body connection, the purpose of this study is to explore how athletes perceive their stress exposure, coping behaviors, and mental and physical health to influence one another, with the goal of understanding whether and to what extent student-athletes perceive their mental and physical health to be connected. Interviews were conducted with eighteen seasoned NCAA Division I student-athletes (9 men and 9 women) at a public Southeastern university. Preliminary analysis indicates that all but one respondent rated their mental health as the same as or worse than their physical health, with half rating their mental health as worse than their physical health. Interestingly, whereas most respondents unequivocally reported feeling as though their physical health influences their mental health, they expressed greater uncertainty about the extent to which their mental health influences their physical health, with male athletes expressing this uncertainty most commonly. These findings, which will be explored in depth, suggest that the mind-body connection may be an important consideration for collegiate athletic departments aiming to better allocate resources to protect athletes' overall health and well-being.

196. Adverse Childhood Experiences and Fraternity Membership
Student Presenter: Molly Steiner
Faculty Mentor(s): Dave Morris

Adverse childhood experiences (ACEs) are any potentially traumatic events that occur during childhood. Sixty-four percent of adults have experienced at least one ACE, and one in six adults have experienced four or more ACEs. ACEs are linked to poor health outcomes in adulthood partly because they predispose unsafe health behaviors like alcohol consumption and drug use. ACEs disrupt a child's healthy development as they move through other life stages. Young adulthood is another important life stage because it is typically around this age that young adults attend college. Fraternities are popular Greek life organizations sponsored by colleges and universities, offering strong social bonds and a vast social network beyond the college campus. They typically have a culture of social drinking as a means to build a "brotherhood" which manifests itself in unsafe binge-drinking behaviors. While many positive outcomes are associated with fraternities, there are also negative consequences linked to membership. The present study will examine the relationship between adverse childhood experiences and fraternity membership. Long-term exposure to ACEs creates toxic stress that predisposes to alcohol consumption and binge drinking which are common behaviors perpetuated by fraternities. Using a survey method, the present study will assess adverse childhood experiences, perceived stress levels, and self-reports of drinking behaviors from a sample of active fraternity members from colleges in South Carolina. This research is valuable in helping colleges and universities assess unsafe drinking behaviors, including identifying particularly at-risk students. This research aims to prevent further tragedies from occurring relating to unsafe alcohol consumption.

SCHOOL OF LANGUAGES, CULTURES, AND WORLD AFFAIRS

Department of Classics

197. Lucan's Haunted Funhouse: Comedic Elements in the Bellum Civile
Student Presenter: Ethan Cole
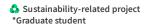**Faculty Mentor(s): James Lohmar**

The horror present in Lucan's De Bellum Civile needs no introduction: from the metaphysical horror of civil war without end and the physical horror that comes from Rome tearing itself apart. Within this poem full of death and destruction lies something expected: comedy. The entire poem is haunted by these profound moments of jokes, puns and gags that follow or proceed moments of horror. This paper evaluates Lucan's simultaneous use of horror and comedy in Bellum Civile and its manifestations throughout the texts including the Erictho episode, the Battle of Massilia and the so-called Pax Sullana. In these scenes, Lucan utilizes horror in conjunction with comedy in these scenes in order to further his rhetorical goal of dismembering the literary, mythological, historical and ideological foundation of the Post Augustan/Neronian regime. Using Henderson's framework of plus quam, this paper intends to analyze the ways in which Lucan utilizes the tropes and conventions of his Epic predecessors in excess in order to disrupt the foundations of Rome's literary tradition. In this way, Lucan turns Roman literature into a haunted house‚Äî a distorted, yet familiar version of reality that lulls the reader into a false sense of comfortability, only to rip it away from them. The reason for this transformation is clear: Lucan perceives the entire Roman Epic tradition as leading up to a singular moment: the tyranny of Nero. Lucan, then by distorting Rome's Epic tradition via horror and comedy, use's Rome's traditions against itself: "in sua victrici conversum viscera dextra."

Department of Hispanic Studies

198. Ain't Nothing Wrong with Negative Concord: Syntax and Social Factors in Eastern North Carolina English
Student Presenter: Silas Bradley
Faculty Mentor(s): Ricard Viñas de Puig

This study investigates Negative Concord (NC) as it appears in Eastern North Carolina English, a dialect historically shaped by migration, isolation, and social stigma. NC is the syntactic construction in which two negative elements contribute to a single semantic negation. This phenomenon exists in both Indo-European and non Indo-European languages, however, as it appears in American dialects, it is often stigmatized. This study examines the syntactic and sociolinguistic factors influencing NC use; namely, it focuses on the relationship between verbal typology and the formation of NC, as well as how NC usage differs based on the social factors. The data for this study was acquired through a Qualtrics survey in which participants were presented with 66 audio recordings; after listening to a statement, they were asked to rate its acceptability on a 5-point Likert scale. The preliminary findings indicate that the linguistic variables being analyzed do not show a statistically significant difference: the verbal typology used in each utterance did not offer a notable influence on the acceptability of NC constructions. However, sociolinguistic variables prove a statistically significant connection to the usage of NC: participants with lower levels of education and those who identify as male are more accepting of NC constructions. Further, participants' place of longest residence also indicated a connection to the acceptance of NC. The results of this study offer a novel insight into the role of linguistic and social elements in dialectical negation, contributing to a broader understanding of syntactic variation in Southern American English.

199. The Effects of tDCS on Second Language Comprehension
Student Presenter: Brooke Cameron

Faculty Mentor(s): Ezequiel Durand-Lopez

Second language (L2) processing is a cognitively taxing task that greatly consumes a myriad of cognitive resources, one being working memory (WM). Given WM's role in processing various kinds of linguistic information, recent efforts have been made to facilitate L2 processing and results appear to be positive. One approach is to stimulate the area of the brain directly associated with WM, the left dorsolateral prefrontal cortex (lDLPFC), which might offer practical advantages by eliminating the need for L2 learners to engage in cognitive exercises for effects to emerge. The present study investigates whether transcranial direct current stimulation (tDCS) enhances L2 listening and reading comprehension . Intermediate Spanish L2 learners were assigned to either a sham (control) or active stimulation group. They completed a listening comprehension task and a reading comprehension task. Participants completed two sessions: one pre-test and one post-test. During the post-test session, tDCS was administered for 20 minutes before completing the linguistic tasks. In the sham condition, tDCS was delivered for 30 seconds at the beginning and turned off and then reactivated at the end of 20 minutes. Data collection is ongoing, but the expected results are that the active stimulation group will show improvements on post-test reading and listening comprehension compared to the pre-test and the control group. This study will advance cognitive psychology and psycholinguistics by investigating ways to aid L2 processing. If tDCS can effectively improve L2 comprehension, it could serve as a valuable tool for sequential bilinguals while they are learning a second language.

200. Exploring Yusku: Collaborative Journeys in a Language Revitalization Project in Nicaragua
Student Presenter: Isaac Hill
Faculty Mentor(s): Ricard Vinas de Puig

Yusku, a variety of the Mayangna language spoken in rural indigenous communities of Nicaragua, is being documented through a collaborative effort between Yusku speakers and a team of indigenous and external linguists. This project employs the Participatory Action Research (PAR) model, ensuring that both indigenous knowledge systems and external linguistic expertise contribute equally to the documentation process. The dictionary's creation began with indigenous speakers gathering linguistic data within their communities. This data was then digitized, analyzed, and revised by both indigenous and external researchers to ensure clarity, consistency, and accuracy in morphology and formatting. The revision process took place at various stages and locations, including team meetings at the tribal government in Rosita and ongoing work at external institutions in the US (College of Charleston and Purdue University). The finalized dictionary is now in the process of being published as an educational tool for Yusku students, contributing to language preservation and revitalization. Beyond creating a linguistic resource, the project also revealed significant lexical and grammatical distinctions between Yusku and other documented Mayangna varieties, highlighting the need for further linguistic research. Additionally, the first edition of the dictionary remains open to expansion and refinement. By employing the PAR model, the project not only produces valuable linguistic materials but also empowers Yusku speakers with the tools and methodologies necessary to continue researching and preserving their language independently. This approach ensures that indigenous voices remain central to the documentation and revitalization efforts for Yusku.

201. The Effects of tDCS on Working Memory and Inhibitory Control
Student Presenter: Andie O'Neill
Faculty Mentor(s): Ezequiel Durand-Lopez

This study examines the effects of transcranial direct current stimulation (tDCS) of the left dorsolateral prefrontal cortex on verbal working memory (WM) updating and inhibitory control (IC). Previous research on tDCS has shed mixed results. This is because various cortical areas have been targeted throughout tDCS research, and there are limited studies on verbal WM updating. A total of 30 participants were randomly assigned to either a treatment or control group. Each participant completed two sessions: a pre- and post-session. In the pre-session, each participant completed a Stroop task (IC task) and a running memory task (WM updating task). Additionally, the treatment group received anodal tDCS stimulation while playing a videogame, not tapping into verbal skills for 20 minutes. The control group played the same game while receiving 20 minutes of sham (placebo) stimulation. The tDCS anodal electrode was placed on the F1 area to target the left dorsolateral prefrontal cortex, and the cathode

was placed on the right inferior occipital lobe. In the post-session, each participant received the tDCS stimulation before completing the cognitive tasks. Data collection is still in progress, but expected results would show significantly larger improvements in task performance between the pre‚Äì and post-session in the experimental group. Results will advance knowledge in improving core executive functioning, which is crucial to study in this specific population. Knowing how to improve these functions may allow us to assist with a myriad of tasks, such as problem-solving, planning, multitasking, etc.

202. Analysis of the Contrasting COVID-19 Pandemic Responses and Results in Brazil and Uruguay ♻️
Student Presenter: Abigail Ryan
Faculty Mentor(s): Sharonah Fredrick

The COVID-19 pandemic posed significant challenges to health systems and governments worldwide. In Latin America, the dramatic difference between the pandemic responses in Brazil and Uruguay presents an interesting case study. While Uruguay received widespread praise for its policies, preparedness, and relatively low case-fatality ratio, Brazil received significant criticism and experienced an elevated fatality rate. Key factors influencing each country's response were analyzed through a literature review of health data, government reports, peer-reviewed research, and local and global news sources. Preliminary findings suggest that a centralized and comprehensive universal healthcare system, non-partisan scientific guidance, and consistent political leadership contribute to more effective disease control while mitigating social and economic disruptions. The insights gathered from this analysis can help inform future public health policy and crisis management.

International Studies Program

203. From Conflict to COVID-19: How Historical and Digital Narratives Shape Vaccine Attitudes in the Democratic Republic of the Congo
Student Presenter: Hannah Barganier
Faculty Mentor(s): Kristen McLean

The COVID-19 pandemic highlighted the need for increased global disease surveillance and response, equitable global vaccine distribution, and understanding the drivers of vaccine attitudes. Despite the Democratic Republic of the Congo (DRC) receiving over 31.2 million COVID-19 vaccines through COVAX, only 16.3 million doses have been administered, with only 12.9% of the Congolese population receiving a single dose. These low vaccination rates can be attributed to political instability, under-resourced healthcare systems, and mistrust driven by rumors, misinformation, and historical legacies of exploitation. This study draws upon secondary data from Facebook obtained through the Meta Content Library, which explores how COVID-19 vaccine attitudes in the DRC are shaped and how historical legacies and relations with the state and international actors influence people's attitudes. Understanding how vaccine attitudes are present in online spaces is essential, especially as they relate to the COVID-19 vaccine because online environments have functioned as key sites where vaccine rumors and myths are shared. This study will increase the knowledge and understanding of what factors drive Congolese people to hold certain attitudes towards vaccines - particularly the COVID-19 vaccine - to help influence future vaccination campaigns more broadly. It is hoped that this research will provide valuable practical and theoretical insights to inform future policies and interventions so as to improve vaccine uptake, both locally and globally.

204. Asia's Multi-Lateral Influence on International Sustainable Development How Foreign Institutions Influence the Asian Commons ♻️
Student Presenter: Shannon Feagin
Faculty Mentor(s): Piotr Gibas
Additional Authors: Beatriz Maldanado, Kristen McLean, Kelsey Whiting-Jones, Blake Scott, Elijah Siegler

This research proposal explores the impacts of unregulated international multilateral institutions on sustainable development. It addresses the paradox where economic growth driven by foreign firms, often comes at the expense of rapid local environmental degradation, particularly in Asia. It examines the complexities of governance and enforcement of international regulatory frameworks. The methodology utilizes an analytical cross-sectional study to compare variables from economic databases such as the OECD, World Bank, IMF, and local banking agencies in contrast with the academic literature on environmental concerns shared by the region's communities to investigate how hybrid governance models influence resource use, and how local communities adapt to external pressures with environmental shocks. The objective is to explore the complexities of common resource management in rapidly developing regions throughout Asia. The study will analyze common areas as suggested by Ostrum and external force relevance by their engagement with the local market (Anderies, J. M., Janssen, M. A., & Ostrom, E. 2011)The findings suggest, that while developed nations excel in sustainable innovation, their rates of natural resource consumption rapidly increase with the development of efficient technology. In contrast, developing nations, while initially understood as the primary culprit of rapid environmental degradation in their industrialization, face external exploitation which exacerbates their environmental vulnerabilities before technological advancement can aid sustainable development locally. The research concludes global sustainable development requires not only local adaptation but stronger and enforceable international regulatory frameworks to address the disproportionate impacts of the current global economic system on local environments

205. Students of the MARSH ♻
Student Presenter: Adeline Rios
Faculty Mentor(s): Blake Scott
Additional Authors: Rhiannon Wilkinson, Isaiah DeBarr, Hannah Escalante

Charleston, South Carolina is known for its southern hospitality. Yet, due to unsustainable development, that has severed ecological relationships and accelerated the effects of climate change, the peninsula has become less and less welcoming to the human, animal, and insect species that call it home. For example, in 2023, Charleston experienced 75 flood events that crossed the 7-foot-line, making it the second highest annual rate on record. The Urban Heat Island effect, resulting from a lack of tree canopy and too much asphalt, makes certain Downtown localities up to 10 degrees hotter than others, on any given summer day. As members of the MARSH Project Student Research Team, affiliated with The MARSH Project (The Marsh Appreciation and Restoration Society for Happiness), we ask the question of what it would mean to foster greater ecological connectivity between Charlestonian residents and their environment. How can we, as student citizens, repair relationships, and in doing so, address the local climate crises that we face today? Together, we founded Students of the MARSH, a dynamic student organization whose members build native plant gardens, clean up the community, reconstruct oyster reefs, and restore salt marshes. We also work in coalition with the MARSH Project to recruit Charleston area homeowners to join the Ecological Corridor which will connect and revitalize the three remaining creeks (Halsey, Newmarket, and Gadsden) with thriving native vegetation and expanded tree cover. By working together, we recognize that we are all, in some capacity, Students of the MARSH.

Jewish Studies Program

206. Queer Jewish Charleston: The Life and Works of Harlan Greene
Student Presenter: Kathleen Cottingham
Faculty Mentor(s): Ashley Walters

This semester I am working on a research project on the life and works of Charleston historian, Harlan Greene. Greene is a Charleston-native and retiree from the Addlestone Library at the College of Charleston. He is the son of two Holocaust survivors who later became shop owners in Charleston's Little Jerusalem neighborhood. Greene's work has been incredibly important in preserving the history and culture of Charleston's queer and Jewish life.

I have a unique perspective in this research project, as a Jewish Studies and Studio Art double major and a minor in Southern Studies. This work is a combination of all my interests and expertise. I am reading a multitude of his works, along with using CofC's Special Collections to gather information on his parents, his life, and his research interests. Working with Professor Ashley Walters, I have started developing questions to ask for oral history interviews and eventual video essay. My poster will include some photo references of important sites from my work, photos of Greene, and information on why he is important to Charleston history. I would also like to present my video essay and bring some copies of his books if possible.

207. From Flappers To Fascism
Student Presenter: Chloe Duncan*
Faculty Mentor(s): Chad Gibbs

The Weimar Republic, 1918–1933, was the child of both the devastation of the First World War and the emergence of modernity. In this era, women played a critical role in the healing of war wounds, as well as the arrival of the modern nation state. This poster examines women's fashion as a reflection of social change during the Weimar Republic, as well as how women's freedom and liberation, as expressed by fashion, intersects with the rise of Nazism. The Weimar Republic became a laboratory in which the emerging modern European woman tested the limits of what could be accomplished politically, socially, economically, and culturally. The German Neue Frau, or New Woman, emerged as an agent of her own, breaking free—if only for a moment—from her traditional constraints. Fashion was one of her main tools, a means of practicality in a world where an increasing number of women entered the workforce, as well as a mode of self–expression and defiance of dominant culture. Nazism, with its rejection of modernity's supposed moral failings, was at odds with the Neue Frau. These independent, self–sufficient women symbolized everything the Nazi regime sought to dismantle. Overall, my poster will show the viewer the importance women, their roles in and outside the home, and how fashion played a part in social change during the Weimar era.

208. From Poppy Sales to Picnics: Jewish Leftist Movements in Kaluszyn, Poland and Charleston, South Carolina
Student Presenter: Julia Silberberg
Faculty Mentor(s): Ashley Walters

In the early-20th century, one-fifth of Charleston's Jewish community traced their heritage to a small Polish town by the name of Kalushin, which was a small industrial center located approximately 40 miles east of Warsaw. 80% of the town's population was Jewish. This poster presentation focuses on the presence and activities of the Jewish radical Left in the town of Kalushin prior to World War II and the Holocaust. Jewish leftist were very active in organizing the Jewish labor movement and socialism, which included the Jewish Labor Bund (Yiddish-culture, socialist group) and labor Zionists. By researching, cataloging, and telling the story of various Jewish leftist groups and their activities within this town, which included staging factory strikes, organizing community education, engaging in contemporary political debates, and even physical altercations, the project aims to not only depict Jewish political life in Kalushin, but also in the greater Jewish world during the interwar period. Additionally, the project will consider the legacy of Jewish leftist activism in Poland among Jewish immigrants who settled in Charleston, SC. Jewish immigrants quickly discovered that the United States was a very different political and racial landscape and they took advantage of their new place in society as white Americans. Central to their acclimation to the United States was the creation of the Kalushiner Society, a welfare society for Jewish immigrants. Research is based on archival materials from the Jewish Heritage Collection at the College of Charleston, post-Holocaust memoir, and archives at the Jewish Telegraphic Agency.

SCHOOL OF NATURAL AND ENVIRONMENTAL SCIENCES

Department of Biology

209. Crafting a Higher Education Strategic Zero Waste Vision through the ATLAS Fellowship with the Post Landfill Action Network. ♻️
Student Presenter: Reese Baker
Faculty Mentor(s): Katie Doherty
Additional Authors: Bailey Crane

Beginning in the Spring of 2023, the Center for Sustainable Development at the College of Charleston began a partnership with the Post Landfill Action Network (PLAN) to work with student interns to create a Zero Waste Action Plan. The Atlas Fellowship works through three stages: Zero Waste Certification, Strategic Visioning, and Action Planning. The zero waste certification process included a campus-wide waste management audit, looking at things like food waste and hard-to-recycle (HRM) material aggregation. Once a catalog of the waste generated on campus was created, drafting the Strategic Vision began. For the visioning process, three stakeholder engagement sessions occurred. The first was an orientation to the Center for Sustainable Development, PLAN, and the ATLAS process. Stakeholders were split into a Scope 1 group (surplus and HRM) and a Scope 2 group (food and single-use items) for the other meetings. After orientation, each group attended visioning meetings. Visioning included analyzing current system deficits and thinking about long-term solutions to achieving the College's Goal to be zero waste by 2035. Stakeholder feedback was then incorporated into a draft Strategic Vision document, created by PLAN. Fellows refined the vision through departmental collaboration, and the finalized Strategic Vision is currently being used as the guidebook for writing project proposals and the attached return-on-investment (ROI) analysis. This project has been instrumental in crafting the College of Charleston Zero Waste Action Plan from the Center for Sustainable Development and in working towards the College's goal of 90% waste diversion by 2035.

210. Effects of freshwater salinization on productivity of green tree frog tadpoles and their predators
Student Presenter: Alex Barron
Faculty Mentor(s): Allison Welch
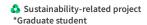**Additional Authors: Maya Mylott and Cole Miller**

Coastal freshwater habitats face the threat of increased salinity due to sea level rise and storm surges. Many freshwater organisms are sensitive to elevated salinity concentrations, and amphibians specifically face a threat due to their permeable skin. Amphibians are important members of freshwater communities, facilitating the transfer of biomass from ephemeral freshwater habitats to terrestrial ecosystems as they metamorphose. Thus, we predict that negative impacts of salinity on amphibians will disrupt the food web within their aquatic environment and reduce the export of biomass to terrestrial systems. Using experimental mesocosms, we investigated interactions between green tree frog tadpoles (primary consumers), algae (primary producers), and dragonfly nymphs (secondary consumers) at control and elevated levels of salinity. We predict that elevated salinity will reduce tadpole survival and biomass and, in turn, dragonfly nymph survival and biomass will be decreased due to reductions in their food supply. Ultimately, we predict that less consumer biomass, in the form of metamorphosing frogs and dragonflies, will be exported under elevated salinity conditions. The results of our experiment will allow us to better understand the effects of freshwater salinization on trophic levels and ecosystem interactions.

211. An Analysis of Microplastic Ingestion by Striped Mullet
Student Presenter: Calvin Biesecker
Faculty Mentor(s): Gorka Sancho
Additional Authors: Barbara Beckingham, Claire Benson, Joey Ballenger

The ingestion of microplastic particles by fish was examined through a study of striped mullet (Mugil cephalus) in Charleston Harbor. Fish were collected in 2024 from multiple sites within the harbor and dissected to extract the

entire digestive system. The digestive tracts were chemically digested and filtered to remove organic material. Filters will be analyzed under a dissecting microscope to identify microplastic particles as films, foams, fibers, fragments, or tire wear particles. Data will be presented to characterize the ingestion of microplastics by striped mullet in Charleston Harbor.

212. Measurements of Capsule Size and Spination in The Eastern Mud Snail (Ilyanassa obsoleta)
Student Presenter: Jamiya Borden
Faculty Mentor(s): Robert Podolsky

The Eastern mud snail (Ilyanassa obsoleta) encloses its fertilized eggs in a set of capsules, where early development takes place. The capsules, which are attached to substrates like algae and shells, are larger than the collection of eggs to accommodate growth and are adorned with spines. The species is distributed along the eastern coast of the US, and over that latitudinal range experiences a broad range of temperatures and other environmental conditions. The goal for this project is to examine the size and spination of capsules across this latitudinal range. Our laboratory harvested egg capsules from different populations from Florida to Maine. We identified 20 landmarks for each capsule using microscope images and are measuring capsule and spine dimensions using the software Fiji. I will be testing for a pattern of variation in capsule size, shape and spination across populations in order to develop hypotheses for the function of spines. These hypotheses will contribute to our examination of latitudinal changes in life history traits in the Eastern mud snail (Ilyanassa obsoleta).

213. eDNA of Shark and Fish Presence in Charleston Harbor
Student Presenter: Dallas Bryson
Faculty Mentor(s): Erik Sotka

Environmental DNA (eDNA) is an alternative surveying tool for examining megafauna that may be more evasive or elusive for visual surveying. Our study aimed to investigate a new technique for collecting eDNA to identify the presence of multiple fish and shark species in Charleston Harbor. We submerged small paper filters in the water at different locations around Charleston Harbor, which, when taken out, filtered out the water and left behind the trapped DNA. Over a year and a half, we collected and processed data for over 80 filter samples. Each sample underwent two PCR reactions - one with a shark amplicon and one with a fish amplicon. Once PCR reactions for all samples were complete, we analyzed if there was the presence of DNA using gel electrophoresis. In the gel images containing shark samples, we looked for a band at ~127 base pairs and a band at ~200 for fish gel images. We observed 18 shark primer samples and one fish primer sample that contained their respective DNA. The 19 samples were shipped to a lab and are being sequenced to determine the shark and fish species. Our study will help determine if this technique is an effective form of eDNA collection. Using filters to collect eDNA would allow researchers to yield more DNA collection as they can be left in the water longer than traditional eDNA methods, providing a better understanding of the biodiversity to contribute to preserving ecosystems and ensuring the health of our oceans.

214. Unfolding Charleston's Past through Alison Saar's Skillet Portrait Emma
Student Presenter: Alexa Bullard
Faculty Mentor(s): Brooke Permenter

First year students at the College of Charleston Honors College participate in a class called Beyond George Street. In this course, students dive into the history of Charleston through place-based learning intended to help students address Charleston's critical issues. This project is based on the school's motto, "Know Thyself," which requires students to explore and analyze artifacts from Charleston's history. Charleston has a broken past, which largely stems from the complicated history of slavery on the grounds on which we walk today. Even post-slavery in Charleston, racism was still abundantly present here and across the South, which is demonstrated through contemporary works such as Alison Saar's Skillet Portrait Emma in the Gibbes Museum of Art. Saar's painting is faintly displayed on the bottom of a heavily used cast-iron skillet, with rusted edges and flaking metal covering the entirety of the pan. The placement of the painting is significant because the bottom of a cast-iron skillet is in direct contact with billowing flames in the kitchen, which is representative of the abuse endured by Black, female

domestic servants even in the 1950's. Saar states in the blurb that "this delicately painted image is intentionally faint thus invoking the relative invisibility of a typical household cook or kitchen maid" (Saar). I chose to explore Saar's piece in the Gibbes Museum to better understand the unfiltered history of the city I now call home, as it is important for us to acknowledge Charleston's historical context in order to thrive as a respectful society.

215. Intranasal Administration of ANA-12 as a BDNF Antagonist in a Neonatal Rat Model
Student Presenter: Kennedy Camburn
Faculty Mentor(s): Serena-Kay Sims
Additional Authors: Aniston Hong, Marie Akirtava, Kennedy Kimball, Rishita Pawar, Caroline Strickland, Jordan Emily Ducham, Maniya McNight

INTRODUCTION: Neonatal stroke, or hypoxic ischemic encephalopathy (HIE), detrimentally impairs early development, yet it is statistically under-diagnosed with limited noninvasive medical treatments available for neonates. Intranasal administration of brain-derived neurotrophic factor (BDNF) has suggested to increase brain plasticity and promote better outcomes in preclinical stroke rat models. However, further exploration of BDNF's mechanism is crucial to understand the molecular underpinnings of BDNF's promising treatment option for HIE treatment. To gain a comprehensive understanding of BDNF, inhibition of this protein is needed. Our study looks to demonstrate that ANA-12, a BDNF receptor antagonist, can inhibit BDNF when administered intranasally. We hypothesized that intranasal administration of ANA-12 will decrease BDNF binding and hinder neonatal rat development. METHODS: Saline (control) or ANA-12 in DMSO and saline was administered via micropipette at the same time daily into each nasal cavity from postnatal day (PND) 8 to PND 15. Reflexive and behavioral tasks were administered on PND 7 and PND 14 to determine development differences between control and experimental groups. Western analysis was performed to analyze neuro-markers, such as tropomyosin receptor kinase B (TrkB) receptor activation and microtubule associated protein-2 (MAP2). RESULTS: The objective of this study was to evaluate the effectiveness of intranasal administration of ANA-12 on BDNF levels, MAP2 levels and TrkB receptor activation. Our results suggest that intranasal administration of ANA-12 leads to a reduction of BDNF levels, MAP2 levels and TrkB receptor activation in neonatal rodents. Our results also demonstrate that neonatal rodents with lower BDNF levels develop and perform differently.

216. Effects of Restored Longleaf Pine on South Carolina Herpetofauna
Student Presenter: Jake Coffman*
Faculty Mentor(s): Eric McElroy

In the last 500 years the longleaf pine, an important ecosystem to half of reptiles and amphibian species across the Southeast, has reduced by 97% due to human development and fire suppression. Today, longleaf pine restoration projects have become popular and often involve methods such as prescribed fire and hardwood removal. However, there are few studies showing the effects of these methods on herpetofauna in restored longleaf pine forests, particularly in South Carolina. The purpose of this study is to examine how herpetofauna communities differ between restored longleaf pine and unmanaged forest. We will compare between 3 longleaf pine and 3 unmanaged hardwood forests at the Stono Preserve in Charleston County, SC. We will use pitfall traps, coverboards, PVC pipes, and visual encounter surveys to sample for terrestrial and arboreal herpetofauna. This study will be useful in determining the effects of restored longleaf pine on herpetofauna in South Carolina.

217. The Influence of DOC/CDOM on Bacterial Abundance and Activity in Charleston Harbor (Charleston, SC). ♻
Student Presenter: Bailey Crane
Faculty Mentor(s): Nicole Schanke

The Charleston Harbor estuary is a dynamic system impacted by the partial mixing of outflow from three rivers and the Atlantic ocean. Climate change impacts are expected to affect biogeochemical cycling and cause worsening runoff due to storm intensity, likely altering estuarine bacterial abundance and metabolic activity, causing harmful algal bloom (HAB) risk to increase. Charleston Waterkeeper collected surface water samples from May to October of 2022 and 2023 at 20 sites around the Charleston Harbor. Water quality parameters included measurements of hydrography, nutrients, and the microbial community. Using flow cytometric analysis, bacterial abundance and

activity was estimated. For this study, a subset of four sites (Ashley River 3 (AR3), Folly Beach 1 (FB1), Filbin Creek 1 (FC1), and James Island Creek 1 (JIC1)) were selected for data analysis. AR3, FB1, and JIC1 bacterial communities were less active than FC1, butAR3 had the largest overall community. AR3 had the highest average DOC content and highest CDOM content, with FC1 closely behind. FC1 also had the highest Enterococcus amounts of all the sites. JIC1 total bacteria amounts were higher at higher temperatures and FC1 bacteria amounts were higher with increased nutrients, suggesting that different sites are influenced more or less by varying factors. FC1 is a highly industrial site, so this increase in bacterial community with nutrients may be due to industrial effluent or flooding events. Overall, this study expands on the current knowledge of water quality parameters and provides a reference for bacterial community dynamics in the Charleston Harbor estuary.

218. Microbiome, Germination, and Seedling Ecology of Drosera (Sundew) From Local Stono Preserve Populations
Student Presenter: Kennedy Cruskie
Faculty Mentor(s): Courtney Murren
Additional Authors: Sheila Jeronimo Lucas and Heather Fullerton

Species interactions and abiotic conditions influence plant growth. Carnivorous plants are particularly sensitive to their conditions, and unique abiotic environments likely contribute to their microbe community. Sundews, a type of carnivorous plant, live in low-nutrient and low-pH soils. Sundews supplement root nutrient uptake by capturing insect prey on their sticky, specialized leaves, which digest the insects for nutrient absorption (in part via microbes on leaves). The insects digested can influence the microbiome and rhizosphere bacteria. We are completing sundew germination trials on agar and soil following cold stratification and TTC trials to evaluate seed viability. We will complete DNA extractions and sequencing to observe differences in microbes on leaves with and without animal prey. Our experiments are ongoing this spring, but we anticipate we will find links between seed size and viability. We anticipate that leaves with animals will have more diverse and abundant microbes as they could assist with digesting prey. We anticipate that the root microbe community would be closer to leaf microbes than the general soil microbes. These results will be used as pilot information for our team's future work in this system. Findings from our studies can demonstrate the beneficial effects of microbial species on plant growth and reproduction, particularly in agriculture and species conservation in response to disease and low-nutrient environments. Plants living in extreme environments with microbial associations, such as those of carnivorous plants, can be informative to a broader range of plants living in a changing environment.

219. Environmental Studies of Leaf Variation With Natural and Mutant Arabidopsis
Student Presenter: Tina Dong
Faculty Mentor(s): Courtney Murren
Additional Authors: unPAK 2022 REEU, April Bisner, Allan Strand, Matt Rutter

Leaves play crucial roles in carbon resource acquisition. Phenotypic plasticity in leaf traits strongly influences how plants maintain adequate resource acquisition in changing environments. Genotypes can vary in traits across environmental conditions. We investigate the combined genetic and environmental effects on plants' response to changing conditions by measuring rosette size, fruit production, and CO2 assimilation. We examined 24 mutant lines and wildtype of Arabidopsis thaliana under two ecologically important environments that influence carbon acquisition, nutrient availability and temperature, studying lines in two groups, those previously characterized to have increased (I) or decreased (D) rosette size in comparison to wild type in a genetic screen. We measured physiological traits for a subset of lines, for additional mechanistic insights on gene influence on observed fitness differences. We found distinct responses to the environmental treatments, with D lines having smaller rosettes and lower fruit production and I lines having overall larger rosettes and higher fruit production. This rank order is maintained across all the treatments, overall showing a decrease in rosette diameter and fruit production with increased temperature and decreased nutrients. We demonstrate that mutant lines display phenotypic plasticity across different environments, and fitness and rosette patterns remain across differing environments for I and D lines. Our study expands on how genotype by environment processes may determine tradeoffs between growth and reproduction. Additionally, with data on the genetic mechanisms behind plasticity, we can apply this knowledge to other plants such as crops to be more resilient in the context of climate change.

220. You Can't See Dolphins on Zoom: Reevaluating Marine Science Education After COVID-19 ♻
Student Presenter: Lilah Grace Elnaggar
Faculty Mentor(s): Chris Freeman

The COVID-19 pandemic has reshaped the field of higher education. As a result of the challenges posed to human health worldwide, education practices in the classroom have undergone critical analysis and drastic transformation. While numerous pedagogical techniques have been adapted to combat the impact of COVID-19, minimal evidence exists about the methods that best support student success post-pandemic (May 2023). To address this, my survey-based project and literature review aims to understand pedagogical shifts pre- versus post-pandemic, and examine their efficacy in sustaining academic progress. The goals of this project are to identify the most beneficial teaching and learning techniques for undergraduate and graduate students. Data collection will be carried out by surveying the on-campus student body (particularly in the Marine Biology/Marine Science field). These results will identify the most effective strategies that will promote both student education and resilience. Though the COVID-19 pandemic created several setbacks across the globe, educators have the power and responsibility to move students forward. This research will unveil the evidence-based practices that encourage learning in an increasingly dynamic environment, ultimately providing mentors and mentees with the tools necessary to succeed despite unprecedented challenges.

221. Ingestion of microplastics by Atlantic Menhaden (Brevoortia tyrannus) in the Charleston Harbor
Student Presenter: Rea Fauser
Faculty Mentor(s): Gorka Sancho
Additional Authors: Claire Benson (SCDNR), Barbara Beckingham , Joseph Ballenger (SCDNR)

Charleston Harbor is a highly urbanized estuarine basin formed by the convergence of the Ashley, Cooper, and Wando rivers. Previous studies have reported high levels of microplastics in the water column, sediments, and fishes within this system. This study investigates microplastic content in the gut of the planktivorous Atlantic Menhaden (Brevoortia tyrannus), a fish species previously reported to have significantly higher microplastic concentrations than other species in the Charleston Harbor. As key prey species in estuarine food webs, Atlantic Menhaden may serve as a source of microplastic transfer through trophic transfer to other predatory species. Menhaden specimens were collected by South Carolina Department of Natural Resources personnel using trammel nets at various sites in the Charleston Harbor. Digestive tracts of each specimen were chemically dissolved in KOH, and the remaining materials were sieved and filtered. Filters were examined with light microscopy for microplastics, which were identified, classified, and counted. Data will be presented on microplastic ingestion by Menhaden collected in 2024, and compare them to historical data from 2018.

222. Mutant lines of Arabidopsis thaliana Experimentally Evaluated Through Nutrient Levels to Simulate a Root Fungal Endophyte Symbiont
Student Presenter: Jodi Garrett
Faculty Mentor(s): Courtney Murren
Additional Authors: Tina Dong, Rea Fauser, and Luke Pillar

Plants require soil nutrients for growth and reproduction, but addition of excessive nutrients can contribute to runoff and negatively affect the ecosystem. Root symbionts in the soil assist in adding nutrient access to plants, and reduce the negative impacts of excessive fertilizer. Using the model system Arabidopsis thaliana, and work conducted on the molecular-genetic mechanisms of the association with a newly found root fungus, we are poised to study the reproductive effects of genes involved at the cellular level. We experimentally grew 9 mutant genotypes, wildtype and two natural accessions, across nutrient treatments in a growth chamber. We will measure rosette diameter and date of bolting and will grow these to be fully mature and count fruit produced as a reproductive fitness measure. We will then use R to visualize our data and perform statistical tests to examine our results. Our experiment is ongoing, yet we anticipate that for these mutants the increased nutrients will enhance rosette size and fruit production. We also anticipate that the mutant lines will differ from each other and wildtype. These data will be foundational for understanding how the plants will react to the added nutrients in the environment and we plan a follow up experiment in the future with the fungus. If these data support a positive

impact on the plant's fitness our results can be applied to agriculture which is important for our food production. This information could also be interpreted for conservation purposes and contribute to saving species with declining populations.

223. From Soil to Sequence: The Process of Discovering RITA130
Student Presenter: Louis Gershon
Faculty Mentor(s): Jessica McCoy

The discovery and analysis of bacteriophages have become increasingly important, particularly for their potential use in combating antibiotic-resistant bacterial infections. Expanding the pool of known bacteriophages increases the chances of finding effective treatments against specific bacterial strains. This study aimed to find a unique bacteriophage from soil samples collected inside Charleston County. Bacteriophages were isolated, purified, and amplified using microbiology techniques. Troubleshooting was required in the isolation process, as contamination of the $CaCl_2$ reagent inhibited early bacteriophage growth. DNA from the discovered bacteriophage, Rita130, was also extracted and characterized. Results indicate that Rita130 was successfully identified as a novel lytic bacteriophage with a total of 96 genes, classified within cluster B. This type of bacteriophage was found to be genetically similar to other cluster B bacteriophages found in the Charleston area, such as Hashim76, and Lolalove. Investigating a common bacteriophage cluster can provide valuable information into what specific genes do and what genes could be useful in fighting bacterial infections.

224. Seasonal Variation in the interactions between Aquatic Insects and Freshwater Sponges
Student Presenter: Murphy Hagen
Faculty Mentor(s): Chris Freeman

Freshwater habitats support high biodiversity despite representing only a small fraction of global aquatic ecosystems. Freshwater sponges are an underrepresented group in these systems but are likely vital as they filter large volumes of water and serve as a habitat for other organisms like aquatic insects. Sponge-insect interactions can range from parasitic to mutualistic, but little is known about these interactions in South Carolina. To better understand these interactions, we collected sponge samples from the same site every month from May to February and isolated macroinvertebrates to understand seasonal dynamics in these communities. In total, 174 macroinvertebrates were collected over the study, with the highest abundance in May. Organisms included larvae of midges, caddisflies, and spongillaflies. Although the abundance and species richness of insects in these sponges varied minimally over time, the composition of these communities changed significantly, especially with decreased temperatures. This research contributes to a broader understanding of the ecological interactions between freshwater sponges and aquatic insects and the importance of freshwater sponges as habitat.

225. Spatial and Temporal Variation in Life History Traits Among Populations of the Eastern Mud Snail (Ilyanassa obsoleta) Local to Charleston, South Carolina
Student Presenter: Kora Hansen
Faculty Mentor(s): Bob Podolsky

An organism's life history describes how it allocates resources at different stages during its life cycle. Tradeoffs in resource allocation, such as between egg size and number, can have major consequences for organism evolution. In turn, environmental factors associated with latitude, like temperature and oxygen, can drive these allocation patterns. In a marine context, the relationship between latitude and early life history traits has been studied most in species that release eggs into the water column. However, relatively little is known about this relationship in species that encapsulate embryos, which can impact early development through the physiological consequences of depositing embryos in dense clutches. Furthermore, to assess latitudinal patterns it is necessary to understand the scale of life-history variation in response to local variation in environmental conditions. To address local variation in the Eastern mud snail (Ilyanassa obsoleta), we measured adult, embryo, and capsule characteristics in five populations local to Charleston, SC. Adult size, capsule size, egg size, egg number per capsule, and energy content varied significantly among populations, suggesting that local microhabitat variation may affect life history differences. This variation will ultimately be compared to a larger study of latitudinal variation in I. obsoleta

populations across their native range from Florida to Maine to further evaluate the degree to which latitude vs. local processes drive life history variation. It is especially important to understand these patterns for widely distributed populations given current warming ocean temperatures.

226. Activation of Calretinin Interneurons Increases Alcohol Consumption in Mice
Student Presenter: Luke LeMaster
Faculty Mentor(s): Jessica McCoy
Additional Authors: Jen Rinker, MUSC

Alcohol Use Disorder (AUD) is a widespread disease that impacts millions of people in the United States each year, and is characterized by the inability to control alcohol intake/alcohol-seeking, despite negative consequences. While the neural mechanisms of AUD are not fully understood, previous research has shown the medial prefrontal cortex (mPFC) becomes dysregulated in individuals with AUD. Within the mPFC, a population of interneurons identified by the presence of calretinin (CR) are of interest for their potential role in the neural mechanisms of alcohol consumption, however, very little research has been conducted on this population of cortical interneurons. Therefore, this study aims to expand our knowledge of the role of CR interneurons in alcohol consumption. Using chemogenetics, we examined if CR interneuron activation was sufficient to increase alcohol consumption. The activating hM3d-Gq-DREADD (designer receptor exclusively activated by designer drugs) was bilaterally injected into the mPFC of transgenic CR-Cre mice. The mice were allowed to voluntarily consume alcohol/sucrose in a modified Drinking-in-the-Dark (DID) paradigm. In the DID model, either alcohol (15% v/v) or sucrose (1% w/v) was presented to the mice in their home cage 3 hr into the dark cycles for 2 hr, 5 days per week. On test days, mice were given either an intraperitoneal injection of saline or deschloroclozapine (DCZ), the DREADD ligand, 30 minutes prior to drinking behavior. Preliminary results of DREADD activation of CR interneurons show a trend toward increased alcohol consumption, while the effect on sucrose consumption remains pending.

227. Phenotypic Effects of Mutations in Aggrecan Cleavage Sites on Aortic and Pulmonary Valves
Student Presenter: Madison LoStracco
Faculty Mentor(s): Renaud Geslain
Additional Authors: Christi Kern, MUSC

Objective: Aortic aneurysms, dissections, and tears are infamously very hard to diagnose and have high fatality rates. Aggrecan (ACAN) (extracellular matrix proteoglycan) and ADAMTS5 (extracellular matrix protease) have been linked by previous research to such aortic anomalies and therefore are important investigative targets. Here, researchers investigate the requirement of ACAN cleavage by ADAMTS5 during aortic wall development in murine models with ACAN cleavage site mutations. Approach: Murine hearts at timepoints of embryonic day 17.5, 1 month, and 6 months of age that have mutations in specific aggrecan cleavage sites (i.e. FREEE1467 GLGSV to FREAA1467 GLGSV and SSELE1279 GRGTI to SSELA1279 GRGTI) will be investigated through phenotypic screening. To examine the cardiovascular phenotype, dissected hearts were fixed in 4% paraformaldehyde and embedded in wax blocks. H & E staining was performed and images of the hearts were taken on a Zeiss. Results: FREAA GLGSV (-/-) mice were initially believed to have exhibited a high penetrance of phenotypic abnormalities as compared to FREEE GLGSV (+/+). With the sample size of n=4 FREAA GLGSV (-/-) mouse hearts included adventitia that had an irregular appearance (such as large empty spaces), hypercellularity, and irregular 'masses' of fatty tissue. However, upon further investigation, n=10 researchers found wild-type littermate mice with these same anomalies. Therefore, a mutation in the FREAA GLGSV (-/-) Acan cleavage site did not seem to affect normal heart development. Conclusions: The data fails to support the hypothesis that the ADAMTS cleavage sites FREEE GLGSV or SSELE GRGTI in Acan are required for cardiovascular development.

228. Kinematics of Fatigue in a Lizard
Student Presenter: Amelia Massa
Faculty Mentor(s): Eric McElroy

Animals escape from predators using locomotion. Sometimes, escapes can be prolonged, resulting in predator and prey fatigue. This study investigates the biomechanics of lizard locomotion in response to repeated predatory

stimulus that was designed to induce fatigue. Each trial consists of two synchronized high-speed video recordings - one from a top-down perspective and another from the side - capturing the lizard's movements as it reacts to the predatory stimulus. This process was repeated until the lizard was fatigued, resulting in fresh, unfatigued recordings and repeated fatigued recordings. We digitized these videos by manually tracking points frame-by-frame; the points marked key anatomical locations on the hindlimb from the tip of the toe to the pelvis. This meticulous tracking process allowed us to quantify kinematic variables such as stride length, velocity, acceleration, limb joint angles, and limb coordination. By analyzing these data points, we aim to understand better understand the biomechanics underlying lizards' rapid escape responses. This research sheds light on lizards' intricate motor control and agility and deepens our understanding of how their survival-driven movement strategies have evolved.

229. The Effects of an Introduced Seaweed on Vibrio spp. Densities in Eastern Oysters ♻
Student Presenter: Emma Mathew
Faculty Mentor(s): Erik Sotka

Invasive species are often studied with focus on their impact on macro-organisms, but less is known about their impacts on microbial communities and dynamics. Gracilaria vermiculophylla is an invasive red seaweed that has thrived in South Carolina's intertidal mudflats since the early 2000s. Previous work found that bacterial densities found in sediment directly under live Gracilaria patches (approximately 300 WM per m^2) were almost double relative to densities on bare sediment approximately 50cm away. Considering this recorded relationship, our focus shifted to densities of the gram-negative bacteria Vibrio spp. found in Eastern Oyster (Crassostrea virginica) tissue as they are often found within the same intertidal habitat as this invasive seaweed. Utilizing a week-long field manipulative experiment during the summer of 2024, when bacterial growth is historically at its peak, we measured 1) total Vibrio density and 2) Specific Vibrio species within oyster tissue in presence and absence of Gracilaria at two sites on the Ft. Johnson intertidal mudflat. For each sample, bacteria densities and species identification was measured with use of TCBS and CHROMagar culture media in-lab with specific focus on identifying epithets known to cause concern for human health when consumed at high densities. We found no significant effect of G. vermiculophylla presence on Vibrio density. However, a site specific difference was recorded which allows us to consider alternative factors that may drive bacteria growth. With this conclusion, water quality, environmental differences, and a broader analysis of microbial dynamics may be a focus of future related research.

230. Image-Based Data Analysis and Visualization of Benthic Organisms
Student Presenter: Lilian Nessen
Faculty Mentor(s): Michael Janech
Additional Authors: Dr. Peter Etnoyer (NOAA National Centers for Coastal Ocean Science)

This project utilizes image-analysis techniques to study low-light or ('mesophotic') coral ecosystems and the species that inhabit them. A large dataset of seafloor images (n = XX) was collected using a remotely operated vehicle (ROV) working in hard and soft bottom environments 50 - 150 meters deep, collecting periodic forward-looking still images. The images will be quality-controlled, filtered, and analyzed to explore the various characteristics of these coral communities. By using Python libraries and Google Colab, image data will be processed, organized, and labeled, to enable machine-learning classification techniques for identifying organisms, key features, and patterns related to coral reef community composition. A second set of images can be used to understand coral growth in laboratory aquaria. The primary methods used will include image filtering, batch processing, and feature extraction, which will be applied to colonies photographed at multiple time points. This will involve extracting specific attributes from the images to quantitate polyp growth and behavior. The goal of the project is to process this data in a way that can reveal meaningful ecological insights. The project also aims to assess the potential impact of restoration activity on corals, particularly how factors such as sediment type, food availability, and changing water quality could affect coral growth and health. This work will enhance the understanding of coral ecosystems by developing more efficient image analysis methods. The results will improve the use of image-based data analysis in marine biology, offering valuable tools for future conservation efforts focused on corals and marine biodiversity.

231. A Spatial Analysis of Charleston Water Quality based on Living Shorelines Presence ♻

Student Presenter: Elizabeth Peebles
Faculty Mentor(s): Nicole Schanke

Shorelines made of natural materials like marshes and oyster reefs are known as living shorelines. They provide benefits like water filtration and wave absorption. As development grows, living shorelines are replaced by hardened shorelines such as seawalls and rip rap. An analysis of the Charleston Harbor Estuary System (CHES) was conducted by comparing water quality to the shoreline type. Water quality data from 2022 and 2023 from 20 Charleston Waterkeeper (WK) sites across the CHES was utilized. To describe the shorelines surrounding the sites, a 0.6 km radius was established around each of the 20 WK sampling sites, and the shoreline type within was noted qualitatively. The shoreline types from all sites were summarized into seven main categories such as hardened, hardened mixed with living, oyster, marsh, etc. Principal Component Analysis categorized the 20 sites into five groups based on similar shoreline characteristics and water quality data. ANOVAs compared all five groups to determine if there was a statistically significant difference in water quality parameters between the shoreline groups. Nine out of twelve ANOVAs showed statistically significant differences in water quality parameters with 2022 and 2023 nitrate and 2023 CDOM the only exceptions. For example, group 2 (high proportion of hardened shoreline) and 3 (high proportion of marsh) had consistently significantly different water quality profiles. The results of this project will further inform about the relationship between living shorelines and water quality, and educate environmental engineers about restoring developed shorelines through natural systems rather than hardened shorelines.

232. Mutant Arabidopsis Responses to Varied Temperature, Water, and Nutrient Conditions
Student Presenter: Luke Piller
Faculty Mentor(s): Courtney Murren
Additional Authors: Matthew Rutter, Allan Strand

Genetic mutations are a fundamental mechanism of evolution and can affect trait expression. Analysis of a set of insertion mutant lines within Arabidopsis thaliana provide evidence of connection between variation of genome to phenotype. Climate change is causing more extreme surface temperatures, and affecting rainfall and water supply for plants. We manipulated temperature and water exposure to compare phenotypic response between mutants of known genes affecting plant response to these stimuli. We also analyzed mutants in drought, freezing, and increased nutrient conditions. Plants were photographed and rosette diameter was measured at 22d and 28d. Fruit number was quantified after the plants had finished flowering. Within the flood and temperature treatments, we found distinct variation of measured traits in our experimental groups compared to control, along with genotype by environment interactions. We demonstrated that single insert mutations have a direct affect on plants' fitness response in stressful environments. In addition, the drought, freeze and nutrient treatments showed unique genotype by environment interactions. In some genotypes, we saw a clear decrease in bolting time for drought, decreased fruit production for freezing, and increased plant vigor for the nutrient categories. These results reinforce that the effect of a single insert mutation on plant fitness varies within and across environments, and demonstrate varying expression across a large diversity of environments and genotypes. The discoveries within this system can be applied to a variety of different organisms, as well as application in horticulture and agriculture.

233. Identifying Novel Proteins Involved in the Enlarged valves and other Aortopathies
Student Presenter: Vineel Prathipati
Faculty Mentor(s): Mark Lazzaro
Additional Authors: Christine Kern, MUSC

Approximately 2% of the population have aortic valve defects. Over time, a third of these patients with valve defects will need replacement surgery due to insufficient blood flow that can damage organs. Many patients with abnormal aortic valves will also develop anomalies in their ascending aorta, the largest artery in the body. Abnormal valves from human patients and mouse models have an excess of proteoglycans, molecules located outside of cells that contribute to the biomechanical properties of tissues. To discover additional factors that may be effective drug targets, mice that lack ADAMTS5 that cleaves and removes proteoglycans were used. Mice without ADAMTS5 develop abnormal cardiac valves and ascending aortas by embryonic day 14.5. Aortic valves and ascending aortas

were dissected from wildtype (WT, normal) (n=8) and Adamts5-/- (n=8) E14.5 hearts for protein lysates. A proteomics approach was performed using liquid chromatography-tandem mass spectrometry (LC-MS/MS) revealed 232 proteins that were differentially expressed in the Adamts5-/- tissues ($P<0.05$, Student't-test). Gene ontology enrichment using ToppGene and STRING identified immune function, clotting, and wound healing as biological processes enriched in the Adamts5-/- (B&H FDR <5.53E-7). Specifically, SerpinF1 (Adj. P value <0.024; Log2 FC 0.56) and Pentraxin3 (Ptx3; Adj. P value <0.002; Log2 FC 1.9) were increased in the Adamts5-/- OFTs. In situ analysis detected Ptx3 and SerpinF1 mRNA in cells that comprise malformed regions in the Adamts5-/- OFT. The altered Adamts5-/- profiles discovered in the Adamts5-/- valve and aortic artery may lead to drug targets for treatment of cardiac valve and vessel diseases.

234. Sharks vs. Moray Eels: Biomechanics of Bite Delivery and Puncture Resistance ♻
Student Presenter: Ella Salinski
Faculty Mentor(s): Andrew Clark

Hostile interactions between apex predators, like sharks and moray eels, increase when prey abundance drops. Biting performance and resistance to bites influence the likelihood of victory. Previously shark skins showed more resistance to damage caused by eel bites. Considering form-function interplay, we 1) measured tooth and jaw sizes from three eels and three sharks, 2) examined correlations between skin thickness and puncture resistance, and 3) built a custom rig for conducting biologically-relevant fast-rate puncture tests with dissected jaws and teeth. Moray skin thickness increased linearly with puncture resistance and have proportionately longer, needle-shaped dentition. Preliminary fast-rate tests on standardized materials demonstrate superior puncture delivery from moray eel jaws and teeth, requiring less investment of mechanical energy. These results corroborate previous results with single teeth.

235. Blood Toxicity and Neural Response in the Area Postrema
Student Presenter: Emma Stacy
Faculty Mentor(s): Nicholas Hindy
Additional Authors: Takashi Sato, MUSC

Nausea is a sensation that causes discomfort and vomiting in humans and can be an adverse side effect of different medications and medical treatments. Researchers still do not completely understand how nausea is triggered within the body, but the area postrema is a part of the brain that could provide new insight into this field of study. The area postrema is a small nucleus homologous between humans and mice located in the fourth ventricle of the medulla oblongata outside of the blood-brain barrier. Its position outside of the barrier has implications for its ability to intercept and transmit signals between the brain and the rest of the body. In humans and other mammals, the area postrema is associated with nausea, vomiting, and detection of toxins in the blood. There is little known about how this nucleus operates in a living animal model; therefore, the goal of this project was to expand on previous literature by mapping the functional and anatomical properties of neural circuits in the area postrema using in vivo two-photon imaging. This method allowed for the responses of neuronal cells and clusters to be visualized in vivo in real time with high spatial resolution and further helped us define the functions and connectivity of living synapses. Understanding the neural projections and mechanisms of the area postrema could allow for the improvement of treatments and medications that can cause nausea, such as chemotherapy or antibiotics.

236. Exploring the Role of Metallothioneins in DNA Damage Prevention and the Sensitivity of Metallothionein-low Ovarian Cancers to Encorafenib
Student Presenter: Evan Villamor
Faculty Mentor(s): Courtney Murren
Additional Authors: Amy Rees (MUSC), Joe R. Delaney (MUSC), and Scott T. Eblen (MUSC)

There has been recent evidence of metallothioneins' role in DNA damage prevention in cancer cells. Metallothioneins (MT) sequester divalent cations including >90% of intracellular Zn^{2+} ions. When cells are exposed to toxic heavy metals, such as cadmium, the metals displace the chelated Zn^{2+} and induce a

conformational change, essentially preventing the toxic metals from causing damage to the cell. Since the metallothionein gene cluster is deleted in ~70% of high-serous ovarian cancers, along with other types of cancer, the Delaney Lab underwent drug screening to discover the potential of FDA-approved cancer drugs that could be effective specifically against low-metallothionein cancer cells. After conducting validation assays, Encorafenib (a mutant RAF inhibitor) was found to make MT-low ovarian cancer cells particularly sensitive. In BRAF-mutant cancers, Encorafenib is known to inhibit the MAPK/ERK pathway, reducing MYC protein levels and consequently slowing proliferation. However, western blot analysis revealed that while the drug reduced MYC levels in MT-low ovarian cancer cells, another pathway may be involved. As a result, a potential non-canonical pathway, in which GSK3Œ≤ may mediate MYC degradation and necrosis, is being explored. This could provide valuable insight into the mechanism of action of a promising drug for treating high-serous ovarian cancer.

237. Analyzing Resource Partitioning in Developmental Stages of Estuarine Sciaenid Fishes ♻
Student Presenter: Camden White
Faculty Mentor(s): Tony Harold

Croakers and Drums (Sciaenidae) are one of the most dominant families in the Charleston Harbor estuaries, and their success relies on their larvae being able to feed effectively. Adult Micropogonias undulatus are primarily benthic feeders, while adult Cynoscion nebulosus are primarily pelagic. Much less is known however about their feeding habits during their larval and juvenile stages. At these stages, the feeding structures of these species have not yet fully developed, and they both live in close association with bottom structure. It is unknown whether they use the same food resources in this shared habitat or if they engage in resource partitioning. Using both young-of-the year Charleston Harbor samples, and archived Grice Marine Lab specimens, gut content analysis was conducted to identify the dietary items of both species to the lowest taxonomic level possible. Preliminary results show that while both species prey heavily on calanoid copepods, C. nebulosus additionally prey on other juvenile fishes. Understanding whether or not these two species partition resources as larvae and juveniles can help uncover more about when ontogenetic changes occur during Sciaenid development. Additionally, overlapping dietary items like copepods shed light on which microinvertebrates are most important for early stages of Sciaenidae fishes. This is valuable since the family is one of the most economically important fish families in the Charleston Harbor. Better understanding their early stages could help pave the way for advancements in management, and could also emphasize the importance of protecting the biodiversity of the estuaries.

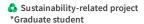## 238. Life on the dredge: Can Dredge Sediment be Used to Make Artificial Structures That Support Local Biodiversity ♻
Student Presenter: Austin Whitlock
Faculty Mentor(s): Chris Freeman
Additional Authors: Peter Lee

Coastal communities are undergoing massive changes in the anthropocene due to large-scale dredging projects and the building of seawalls that reduce the availability of naturally complex substrates for the settlement of organisms. The aim of this study was to test the viability of using recycled dredge sediment as a potential artificial substrate for the settlement of algal and sessile invertebrate communities. The communities on panels printed from dredge sediment were compared to those on printed ceramic. In addition, to test the impact of surface complexity on the diversity and composition of these communities, panels varied in their topographical complexity, with deep cavern areas and higher surface area on some panels. Panels were deployed on the side of a dock in the Wadmalaw river for a period of five months. Panels were monitored biweekly and photographed to estimate the percent cover of different species using Coral Point Count software. Panel processing is underway, but both dredge sediment and ceramic tiles were colonized rapidly by organisms over the course of this experiment. This work provides preliminary evidence that dredge sediment can be used in the construction of artificial habitats for sessile marine species.

239. In a Pinch: Examining the Relationship Between Claw Structure and Force Generation in Panopeus herbstii ♻
Student Presenter: Zoe Willis
Faculty Mentor(s): Robert Podolsky

Additional Authors: Katherine Mullaugh

Organisms that consume hard-bodied prey must generate significant forces to overcome their prey's physical defenses. Many crustaceans, for example, rely on clawed appendages to crush the shells of their molluscan prey, making pinching force a critical factor in their success. The mud crab Panopeus herbstii is an important predator in oyster reef communities of the western Atlantic, where they feed on oysters, mussels, and other shelled molluscs. We examined the relationship between pinching force and the mechanical, structural, and material features of claws for individuals that varied in size. Crabs were collected from three locations in Charleston, SC over five months. Claw and carapace dimensions, crab sex, and crusher claw pinching force were measured. The crusher claw was then removed, frozen, and later analyzed to determine cuticle stiffness and thickness, as well as crushing mechanical advantage. A portion of the claw, the distal surface of the propodus, was dried and digested, then analyzed for calcium content by flame atomic absorption spectroscopy. The relationship between these measures of claw structural strength and pinching force will be compared for individuals that vary by size, sex, location, and time collected. These results provide insight into the role of pinching performance in predation for a minimally studied family of crabs, Xanthidae, which are a vital component of intertidal communities worldwide.

240. Assessing the Impacts of The Boring Sponge (Cliona celata) on The Compressive Strength of Eastern Oyster (Crassostrea virginica) shells
Student Presenter: Leah Wysocki
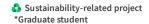**Faculty Mentor(s): Chris Freeman**

Oyster reefs support diverse communities of organisms, improve water quality through filter feeding, and protect coastlines, marshes, and seagrass beds from erosion and flooding. However, eastern oyster (Crassostrea virginica) populations are at record lows due to pollution, unsustainable harvesting, and bioerosion due to the sponge Cliona celata. C. celata uses a combination of chemical and mechanical methods to excavate networks of tunnels within oyster shells. Although it is well known that many restored oyster reefs in Charleston are being infected by C. celata, little is known about how boring by these sponges impacts the strength of oyster shells. The goal of this study is to assess and quantify the impact of boring on oyster shells in terms of compressive strength. Both healthy shells and diseased shells of varying stages of infection (based on percent cover of visible boring) will be measured (length in mm, width in mm, and height in mm), weighed, and the density will be determined by water displacement. Compressive strength will then be assessed by increasing the amount of force applied until the shell cracks and the force meter shows a major drop in load compression force. Once fractured, shell thickness in mm will be measured. These results will improve our understanding of how infection by C. celata impacts oyster restoration efforts in Charleston.

Department of Chemistry and Biochemistry

241. Photodegradation of Minoxidil in Simulated Natural Water
Student Presenter: Maggie Armes
Faculty Mentor(s): Wendy Cory
Additional Authors: Revs Revels

Many topical medications used in daily life are applied and eventually rinsed off, thus allowing excess amounts of the medication to reach our waste water treatment facilities. These facilities, however, are not designed to remove these kinds of compounds from the water, and trace amounts can potentially reach drinking water. While these compounds may not be harmful, they could then reach natural water systems where they have the potential to degrade or transform into other compounds due to exposure to sun or other environmental processes. In this study, the solar photodegradation of minoxidil - a common hair loss treatment medication - was observed in several aqueous solutions, and products of the degradation were identified. The solutions were investigated using

high performance liquid chromatography (HPLC), and the data was used to determine photodegradation rates with respect to humic acid and fulvic acid concentrations. Any byproducts of the solar degradation were observed using spectroscopy and will be further investigated with liquid chromatography-mass spectrometry (LC-MS). The results of this study can help better understand the impact of common pharmaceuticals on the safety of our water systems.

242. "Know Thy City, Know Thyself": Honoring Place via Story in Charleston, SC
Student Presenter: Amelia Bodner
Faculty Mentor(s): Brooke Permenter

As a freshman in the Honors College at the College of Charleston, I participated in a place-based learning experience that was designed to connect students with the history and culture of the city. Using the City as Text ™ model, we explored Charleston's urban landscape to better understand its history and our role in it. My project focused on Patrick Dougherty's "Betwixt and Between" installation in the Gibbes Museum of Art, questioning how its use of natural material reflects Charleston's architectural and historic heritage. By examining the relationship between the installation and the city's iconic church steeples, I considered how art can serve as a bridge between past and present. Through traveling to the sites, doing historical research, and drawing on my own experience, I analyzed how Dougherty's work is connected to Charleston's built and natural environment. I compared the materials and forms of the exhibit with the city's colonial architecture and religious landmarks. This project deepened my understanding of how art both honors a city's heritage and invites reinterpretation, reinforcing the role of place in shaping identity.

243. Evaluating the role of glutathione peroxidase-1 in the intracellular survival of Porphyromonas gingivalis within in vivo in mice models
Student Presenter: Jenna Cagle
Faculty Mentor(s): Brooke VanHorn
Additional Authors: Ozlem Yilmaz, MUSC

Porphyromonas gingivalis, an anaerobic oral microbe closely associated with periodontitis, has been shown to evade various host immune responses in gingival epithelial cells (GECs) where it intracellularly colonizes and persists. Our lab also discovered that P. gingivalis induces a large production of a host antioxidant, glutathione (GSH) in the GECs which aids the microorganism in neutralizing the antibacterial HOCl. Interestingly, depletion of host GSH by buthionine-sulphoximine, a co-factor for glutathione-peroxidase-1 (GPX-1) enzyme, significantly diminishes the intracellular survival of P. gingivalis in both human and mouse GECs. Using a GPX-1 knockout (GPX-1 KO) in-vivo mouse model, we have identified that in the absence of GPX-1, P. gingivalis infection spreads systemically instead of being localized to the gingival mucosa. This showcases the necessity of GPX-1 in P. gingivalis' chronic colonization in GECs. We have also found that GPX-1 KO mice had a lower baseline level of alveolar bone, a decreased amount of alveolar bone resorption upon P. gingivalis infection, and a significantly lower amount of gingival tissue colonization by P. gingivalis than their wildtype counterpart. However, the P. gingivalis infected GPX-1 KO mice had a much stronger colonization of P. gingivalis in the brain than the wildtype mice infected with P. gingivalis. These findings suggest that P. gingivalis targets host GPX-1 for well-adapted intracellular survival and establishment of chronic infection in gingiva. The depletion of GPX-1 may cause P. gingivalis infection to go rogue, potentially spreading to other areas of the body and leading to diseases such as Alzheimer's disease.

244. Biological Role of the Complex IV Assembly Factor Pet117
Student Presenter: Alyssa Craft
Faculty Mentor(s): Jennifer Fox
Additional Authors: Madison Meeks

The electron transport chain (ETC) in mitochondria is essential for human health. By passing electrons along the chain, the ETC stores energy in the form of an electrochemical gradient, which is used by ATP synthase to drive the synthesis of ATP. The cell can then use that ATP to fuel the numerous energy-requiring processes necessary for life. The ETC consists of several components, including Complex IV, an enzyme made of many subunit proteins and

cofactors that passes electrons to molecules of oxygen to complete the ETC. Without Complex IV, the ETC cannot function. The process by which the cell builds Complex IV is complicated and involves many steps. If the assembly of Complex IV is not carried out successfully, a variety of health conditions can result, which are collectively referred to as mitochondrial disease. We are using baker's yeast as a model organism to study one protein that aids in Complex IV assembly, named Pet117. Without this protein, Complex IV is not successfully assembled and the ETC is nonfunctional. In humans, mutations in the gene encoding Pet117 lead to mitochondrial disease. However, the exact role of Pet117 is unclear. Therefore, the goal of this project is to enhance our understanding of the function of Pet117 in the cell. We discovered a new interaction between Pet117 and a component of the ETC that may shed light on its role in ETC assembly.

245. Expanding the EndoUniverse: Structural and biochemical characterization of gamma-coronavirus endoribonuclease Nsp15
Student Presenter: Erik Daquilanea
Faculty Mentor(s): Meredith Frazier
Additional Authors: Kedar Sharma (Genome Integrity and Structural Biology Laboratory), Robert Dutcher (Epigenetics and Stem Cell Biology Laboratory), Mario J. Borgnia (Genome Integrity and Structural Biology Laboratory), Robin Stanley (Signal Transduction Laboratory, NIEHS/NIH)
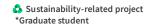
RNA viruses are not only a large human health concern, but also a large economic concern, due to animal infections in major industries. Infectious bronchitis virus (IBV) and Turkey coronavirus (TCoV) are enveloped, (+)-sense single-stranded RNA viruses in the Nidovirales order that significantly affects the poultry industry. Their genomes encode for multiple nonstructural proteins (nsps) that are involved in viral replication. Nsp15, a uridine specific endoribonuclease conserved across nidoviruses, processes viral RNA to evade detection by the host immune system. While the enzymatic function is conserved, the oligomeric state necessary for activity does not appear to be conserved. How oligomerization affects Nsp15 RNA recognition and processing remains poorly understood. Here we determined the first cryo-EM structure of IBV Nsp15 at a 3.2 Å resolution. Biochemical assays to study RNA cleavage were performed using various biologically relevant RNA substrates to reveal sequence and base specificity. Cryo-EM data shows that the IBV Nsp15 forms a similar hexameric shape to other coronavirus Nsp15 such as SARS-CoV-2, MHV, and MERS. Despite a conserved structure, biochemical data suggests that gamma-coronavirus Nsp15 shows a different preference for the base adjacent to the cleavage site. Collectively, these findings advance our knowledge of the conservation of Nsp15 structure and function across diverse nidoviruses, which will provide new insight into targets for viral inhibition.

246. Combinatorial Access to Sequence Diversity in Peptides Composed of Abiotic Amino Acids
Student Presenter: Julianna DeMauro
Faculty Mentor(s): Michael Giuliano
Additional Authors: Christian Herring, Aasim Khan, Danny Kunkle, Allison Moore, Serena Tregay, and Jay G. Forsythe

The field of proteomics has been fueled by the incredible wealth of mass spectrometric data not only for full proteins, but for their digested peptides. The ability to diagnose disease, and answer myriad questions at the interface of chemistry, biology, and human health is dependent upon our understanding of how canonical amino acids, the building blocks that compose our proteins, generate different patterns of data from complex mixtures. The effect that noncanonical amino acids have on this kind of data, how they might ionize in mass spectrometry experiments, how they may produce different patterns of fragments, has not been systematically explored, and yet it remains a fundamental question. As NASA scientists scour the universe for the chemical signatures of life, it has become apparent that noncanonical amino acids are commonplace, and it is therefore not unreasonable to suggest that peptides that incorporate them be viewed as signatures of environments hospitable to living organisms. In this work, a team of undergraduates enrolled in CHEM 423, Bioanalytical Chemistry, has used combinatorial synthetic methods to produce a library of ~450 peptides that incorporate noncanonical and canonical amino acids in various sequence patterns. They have further begun to analyze these peptides using state-of-the-art MALDI-TOF MS/MS and ESI-Orbitrap MS/MS instrumentation here on our campus to begin building a database of the effects that noncanonical amino acids have on chemical detection and analysis of peptides.

247. Navigating Justice, Inequality, and Resilience: A First-Year Journey Through Community and Culture in Charleston ♻
Student Presenter: Laura Finelli
Faculty Mentor(s): Brooke Permenter

At the College of Charleston Honors College, first-year students depart the classroom to explore the city's complex history and culture, focusing on social justice, identity, and resilience. Through immersive, place-based learning, students engage with the community to deepen their understanding of Charleston's history and their own role in shaping its future. In my exploration of Demond Melancon's exhibit at the Halsey Institute, I connected his art with my own experiences of engaging with Charleston's culture. Melancon's work is full of emotional depth, color, and texture, conveying urgent themes of race, identity, and the fight for justice. As I observed, the statement "as any means are necessary" stood out to me, mirroring my own commitment to social justice. Like Melancon's art, my volunteer work with Meals on Wheels has allowed me to witness how culture shapes our community. The interactions with those I serve remind me of the intricate personal stories behind every individual. Additionally, the sponsorship from my cheer coach has given me insights into the role of mentorship and community support in shaping one's identity and resilience. Walking through Melancon's gallery, I was reminded of how essential it is to understand the history behind the culture we see today. Whether in art, volunteerism, or mentorship. Through these experiences, I am learning how to navigate my own path as a scholar-citizen, actively engaging with the issues that matter to me, just as Melancon encourages through his art. These experiences will continue to influence the way I approach contributions in my community.

248. Triptolide-Based Therapies: Advancing Treatment for High-Risk Medulloblastoma With Caution ♻
Student Presenter: Laura Finelli
Faculty Mentor(s): Jezabel Blanco

Brain tumors are the leading cause of cancer-related deaths in children, with medulloblastoma (MB) being the most common. MBs are classified into four major subgroups, with Group 3 (G3) accounting for 1/4 of cases. MYC amplification is the most frequent genetic alteration in G3 MB, making these tumors highly dependent on MYC for growth. G3 MBs also have a high propensity for metastasis, contributing to poor prognosis and aggressive behavior. The outcomes for G3 MB patients highlight the need for improved therapies. We recently demonstrated the effectiveness of triptolide, a natural compound identified as a super-enhancer inhibitor, and its clinical prodrug, Minnelide, in reducing MYC signaling and inhibiting G3 MB growth. However, these results should be interpreted cautiously when considering clinical testing in recurrent MB patients, where therapies target highly aggressive metastatic disease. Despite the promise of our preclinical data, none of the models used were designed to evaluate Minnelide's efficacy in metastatic lesions. Given that ~96% of G3 MB patients present with metastatic disease at relapse, my project focuses on assessing the metastatic response to Minnelide. We cultured MB cells in artificial cerebrospinal fluid (aCSF), mimicking the metastatic tumor environment. When orthotopically implanted, cells in aCSF exhibited more aggressive behavior than those cultured in standard complete media and demonstrated a reduced response to triptolide. Our findings suggest that while triptolide derivatives show promise, further studies are needed to determine their efficacy against metastatic lesions, which is the focus of my research.

249. A Corroboration of Computed Peptide Analogs as a Holistic Cancer Therapeutic
Student Presenter: Aileen Flothmann-Vargas
Faculty Mentor(s): Sandra Craig

The journey of anti-cancer therapeutics has been marked by significant milestones, from the early use of surgery and radiation to the advent of chemotherapy, targeted therapies, and immunotherapy. However, these current remedies have prompted demand for innovative alternatives that can reduce the costs and negative complications patients sustain, as well as intercept the development of cancer. Cyclin dependent kinase 2 is a protein that acts as a checkpoint control during the cell cycle making it often a target for drug development. Some drugs compete with ATP to inhibit this protein; however, such drugs do not perform well in current clinical trials due to their lack of specificity, targeting other areas where their inhibitory properties are not needed. Therefore, inspired by Dr. Sandra Craig's early drug discovery efforts with previous colleagues, by targeting CDK2 via cyclin binding groove peptides,

this issue can be addressed. This is because cyclins are proteins that regulate the steps of the cell cycle by activating CDK2. Utilizing computational analysis, our research implements REPLACE, a strategy converting peptide inhibitors of protein-protein interactions to be pharmacologically applied through optimization and modification of peptide chains. The basis for peptide modification chosen, HAKRRLIF, is an optimized peptide sequence. The goal of this project is to eventually produce a computationally optimal, peptide derived compound that can be applied in a biological system. This research will aid in understanding the feasibility of cyclin binding inhibitors as a modern solution that eliminates therapeutic ramifications for an illness that has persisted for so long.

250. Investigating gammacoronavirus EndoU Interactions With dsRNA
Student Presenter: Abigail Graf
Faculty Mentor(s): Meredith Frazier

Infectious bronchitis virus (IBV) and Turkey coronavirus (TCoV) are enveloped, single-stranded RNA viruses, both gamma-CoVs of the greater Nidovirales order. Both viruses have caused major losses in the poultry industry, and IBV has high rates of mutation that decrease the efficiency of vaccination. Nidoviruses encode for a series of conserved non-structural proteins, including nsp15 (aka NendoU). NendoU aids in viral replication and cleavage of RNA to evade the host immune response. This presents a promising target for possible therapeutic treatments. The NendoU protein becomes active upon oligomerization, but the type of oligomerization is not conserved across nidoviruses. There is little known about NendoU structures for gamma-CoVs, including IBV and TCoV. The Frazier lab has determined the first apo-structure for the IBV NendoU. To further understand the structure of this NendoU, observing how dsRNA interacts, binds, and cleaves are the aims of this project. Since dsRNA is a biologically relevant molecule and intermediate, it's important to determine its role in this structure.

251. NMR Study of the Somatostatins
Student Presenter: Christian Herring
Faculty Mentor(s): Michael Giuliano
Additional Authors: Ella Kasten

Neuropeptides are molecules found in the human body, composed of their building blocks, amino acids, which transfer signals. One of these neuropeptides is Somatostatin (SST), which has implications in the treatment of neuroendocrine cancers and diabetes. Somatostatin comes in two forms, SST-14 and SST-28, with the numbers describing how many amino acids they are composed of. The primary focus of the Giuliano Laboratory is to explore the structural differences in various neuropeptides. For SST, we have a unique opportunity to study a previously unknown difference between the two forms. SST is cyclic (ring shaped), and from that ring extends a "tail" of amino acids. The "tail" of SST-28 is much longer than SST-14, and is hydrophilic (water attractive), while the ring itself is hydrophobic (water repellant). We hypothesize that if a cyclic peptide has a long, hydrophilic tail, it could potentially bring in water molecules and increase how rigid the ring is, which has implications for how SST binds with receptors in the body. We plan on making the peptides using a method called solid phase peptide synthesis, and by using Nuclear Magnetic Resonance (NMR), we can assign structures to peptides and compare them. So far, we have successfully synthesized SST-14 and have begun assigning NMR data. Since SST-28 has proven difficult to synthesize, we are currently making multiple SST-14 variants with progressively more lysines (a hydrophilic amino acid) on the tail to simulate the effect. We will then assign their NMR data and compare it to regular SST-14.

252. Optimizing Diosmetin Analogs for Enhanced CDK2 Inhibition and Anticancer Activity
Student Presenter: Terranee Hines
Faculty Mentor(s): Sandra Craig
Additional Authors: Annisa Evans

Flavonoids are naturally occurring compounds found in teas, wines, fruits, and vegetables, known for their diverse medicinal properties. Among them, Diosmetin has demonstrated anticancer potential by inducing G2/M phase arrest. However, its high reactivity and hydrophilicity lead to rapid metabolism, limiting its bioavailability. To overcome this, we synthesized Diosmetin analogs with modified hydroxyl and functional groups to improve metabolic stability and circulation time. Cyclin-Dependent Kinase 2 (CDK2) is a key regulator of the cell cycle, and

its dysregulation has been implicated in various cancers, making it an attractive therapeutic target. Flavopiridol, a polyphenolic scaffold, has shown pan-kinase inhibition by binding to the ATP-binding pocket of CDK2 through hydrogen bonding. Inspired by this, our study focuses on developing Diosmetin-based inhibitors targeting CDK2. Cell viability assays using MTT analysis were conducted on cancer and bacterial cell lines, revealing promising antiproliferative and antimicrobial effects. Our research aims to optimize flavonoid-based drug design by improving stability and target specificity, contributing to the development of novel anticancer and antimicrobial therapies.

253. Nitric Oxide is Required for Cocaine Relapse-Induced Structural Plasticity: Evidence from Immunohistochemistry.
Student Presenter: Elizabeth Hochberg
Faculty Mentor(s): Jay Forsythe
Additional Authors: Micheal Scofield (Medical University of South Carolina), Adam Denton (Tusculum University)

Cocaine use disorder (CUD) is a serious condition impacting millions of individuals around the world. Cocaine use involves a ruthless cycle of drug-seeking, cessation of use (abstinence) and relapse to cocaine use. Relapse to cocaine use following prolonged abstinence remains the most severe obstacle in the treatment of CUD. Rodent studies of self-administration (SA), extinction (EXT), and reinstatement (relapse) have demonstrated that relapse to drugs of abuse can be triggered by cues in the environment previously associated with drug use. These studies have also shown that reinstatement to cocaine engages both glutamate release and structural plasticity changes in the nucleus accumbens core (NAc), a major reward center of the brain. Despite these findings, the exact link between glutamate and NAc plasticity remains to be determined. Previous studies from our lab have demonstrated that cocaine-induced glutamate increases drive increased concentrations of nitric oxide in the NAc. Here, we examined if NAc nitric oxide is required for NAc structural plasticity following relapse to cocaine. Using short hairpin RNA (shRNA) technology, immunohistochemistry, and confocal microscopy, we demonstrate that NAc nitric oxide signaling is required for structural plasticity changes to NAc neurons following relapse to cocaine. This work demonstrates a highly important, yet under researched, mechanism by which cocaine induces structural changes within reward centers of the brain.

254. Identification of structure, substrate specificity, and kinetic characterization of endonuclease YloC from Bacillus Subtilis
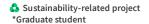**Student Presenter: Ella Jennings**
Faculty Mentor(s): Marcello Forconi
Additional Authors: Aasim Khan and Meredith Frazier

Bacteria must respond to changes in their environment to survive. They do this through chemical messages called mRNA. Bacteria can regulate their mRNA expression using different enzymes, some of which work to break down RNA by cutting them up into smaller pieces. One enzyme class that does this job is called an endonuclease. A new enzyme of this class, YloC, belonging to a family of proteins called YicC was recently discovered. Previous studies found that YloC requires metal ions to function and cuts single-stranded RNA with a preference for pyrimidines. YloC is predicted to function as a hexamer and form a clamshell-like structure. However, YloC's structure, substrate specificity, and kinetic profile remain unknown. This study aims to investigate the structure of YloC, determine which RNA sequences YloC prefers cutting, measure how quickly it digests them, and test how different metal ions affect its activity. To study these proteins, they are overexpressed in bacteria and then purified biochemically. Once purified, the structure of YloC is studied using cryo-electron microscopy, and its function is probed using gel electrophoresis. Gel electrophoresis separates RNA of different sizes, so RNA tagged with fluorescent markers is imaged using a fluorescent imager, and these images are analyzed quantitatively using different software. This provides insight into how the RNA is being cut and the rate of this cleavage. Answering these questions will provide insight into the functional role of similar enzymes and expand our general knowledge of mRNA regulation in bacteria.

255. Investigating The Role of GATA6 in Cancer-Associated Fibroblasts Within the Pancreatic Tumor Microenvironment
Student Presenter: Ryochi Jimenez
Faculty Mentor(s): Lu Han

Additional Authors: Tom Walter, Michael Ostrowski MUSC Hollings Cancer Center

Pancreatic cancer is the third leading cause of cancer-related deaths in the United States with pancreatic ductal adenocarcinoma (PDAC) accounting for 90% of cases. Compared to other cancers, PDAC's 5-year survival rate is only 13%. Previous studies from our lab suggests that transcription factor GATA6 is expressed in some cancer-associated fibroblasts (CAFs). Upon deletion of GATA6 in genetically engineered mouse models (GEMMs), increased tumor burden was observed, suggesting a tumor-restraining role for GATA6. To investigate the role GATA6 plays in other aspects of tumorigenesis, we explored whether GATA6 regulates proliferation in CAFs. With immunostaining, we compared the difference in proliferation between the Gata6 WT vs. Gata6 cKO. Preliminary data suggests that Gata6 WT fibroblasts proliferate more than Gata6 cKO, suggesting that GATA6 regulates proliferation in CAFs. Better understanding the intracellular mechanisms within the tumor microenvironment (TME) could lead to more effective therapeutic targets and improved patient outcomes.

256. Solar Photodegradation of Hydrocortisone
Student Presenter: Ellie Kaess
Faculty Mentor(s): Wendy Cory
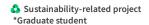**Additional Authors: Abby Runkle, Revs Revels**

Pharmaceuticals in the aquatic environment pose potential ecological risks, and their degradation behavior remains an area of active research. This study investigates the solar photodegradation of hydrocortisone - a topical steroid that decreases inflammation in the skin - under simulated solar exposure and examines the influence of Suwannee River Fulvic Acid (SRFA) and Suwannee River Humic Acid (SRHA), forms of natural organic matter, on the degradation process. Hydrocortisone samples were exposed to simulated sunlight for 12, 24, 36, 48, and 60 hours, and degradation was analyzed using High-Performance Liquid Chromatography (HPLC) to determine the rate of solar photodegradation in aqueous solutions. Results indicate that hydrocortisone degradation follows first-order kinetics. The presence of SRFA and SRHA accelerated degradation compared to hydrocortisone alone, suggesting that natural organic matter plays a role in enhancing photodegradation for this specific compound. These findings provide valuable insights into the behavior of hydrocortisone in the aquatic environment and underscore the importance of considering interactions with natural organic matter in environmental degradation studies.

257. Synthesis of Cyclic Somatostatin and Hydrophobic Effects
Student Presenter: Ella Kasten
Faculty Mentor(s): Michael Giuliano

Somatostatin is a 14 amino acid neuropeptide responsible for cell-cell signaling, endocrine regulation, neuroendocrine disorders and tumors. The structure of Somatostatin has not yet been fully elucidated, and doing so would be important to the design more effective medicines that target the receptors of these peptides, as an estimated 35% of all known FDA drugs target these receptors. The Giuliano lab uses the theory of hydrophobic effects to study the folding of small peptides. In this experiment, a hydrophilic amino acid tag was added to the end of somatostatin 14 to understand the effects of on the structure of the hydrophobic region. We hypothesize that the added hydrophilicity will force a more ordered hydrophobic domain. Cyclic somatostatin-14 (SST-14), a glycine-lysine tag (KG- SST-14), and a double tag (KGKG-SST-14) were synthesized by solid phase peptide synthesis, purified by HPLC, and studied by Mass spectrometry, showing the correct peptides were made. NMR comparison between the structures show slight structural differences with the addition of each hydrophobic tag, and an upcoming 2D NMR analysis of these peptides will allow us to calculate the peptides' three-dimensional structure.

258. The Effect of Amines in a Nucleophilic Aromatic Substitution
Student Presenter: Kelly Matera
Faculty Mentor(s): Marcello Forconi

The environments inside protein structures and at the boundary between membranes and water are quite different from regular solvents. Special probes are needed to measure these unique properties. In our laboratory, we explore

an easy way to add specific chemical groups, such as cyano and fluorine, to peptides, proteins, and membranes. We use a chemical reaction involving fluorinated aromatic compounds and medium- to long-chain thiols. Our experiments showed that a compound called 2,4,6-trifluorobenzonitrile reacts specifically with thiols, even when other reactive species are present, and produces minimal side products. This selective reaction is important because it ensures that the desired modifications are made without unwanted byproducts. The reaction needs an added component, which is required in order to have the thiol in its active form. In this work, we tested various amines to see how their ability to convert the thiol to its active form affects the reaction rate. We predicted that amines more basic than the thiolate nucleophile would be effective in speeding up the reaction. Herein, we present our results using different amines and discuss their impact on the chemical reaction, highlighting the potential applications of this method in biochemical research and in the study of the properties of biological membranes.

259. Exploring Folding Thermodynamics in Irregularly Structured Peptides
Student Presenter: Jordyn Pieper
Faculty Mentor(s): Michael Giuliano
Additional Authors: Stuart Parnham, University of North Carolina School of Medicine

Small signaling peptides, such as neuropeptides, play myriad critical roles in human physiology. Despite hundreds of known sequences, there is relatively little description of neuropeptides' intrinsic structures found in the Protein Data Bank. In this knowledge gap we seek to better understand the fundamental, intrinsic conformations of these vital components of the human nervous system and the folding of small peptides more broadly. We previously observed that a small fragment of the neuropeptide galanin adopts an "irregular secondary structure," seemingly trapped between wholly discorded and folded states. While this peptide, hGal(2-12)KK, adopts a rigid backbone and hydrophobic clustering of sidechains, it lacks intrachain hydrogen bonding common to canonical secondary structures. We suspect these structures are common in many other small signaling peptides, and are actively exploring both their generality and, in this work, their stability. Backbone Thioester Exchange (BTE) has previously been used to study canonical peptide folds such as helix bundles, beta-hairpins, as well as hybrid structures of peptidomimetics but has never been applied to study irregular secondary structures. Herein we describe our efforts to adapt this method to a modified thiodepsipeptide analog of hGal(2-12)KK, in an effort to measure the driving force provided by hydrophobic amino acids toward irregular secondary structures, which, we hypothesize, act as models for the early collapsed stages of protein folding.

260. Inductive Effects on Intramolecular Hydrogen Bond Strength
Student Presenter: Shane Schroeder
Faculty Mentor(s): Richard Lavrich
Additional Authors: Kristin Krantzman

A joint computational and high-resolution spectroscopic study has been undertaken to examine the role that inductive effects have on intramolecular hydrogen bond strength in linear amino alcohols. The amino alcohols under investigation are 2-aminoethanol (2AE), 2-amino-1-trifluoromethylethanol (2ATFME), and 2-amino-1,1-bis(trifluoromethylethanol (2ABTFME). The presence of the electron withdrawing group CF3 in 2ATFME and 2ABTFME adjacent to the hydrogen donating alcohol group results in an increase in its acidity relative to 2AE. As a result, it is hypothesized that a stronger $OH\cdots N$ intramolecular hydrogen bond will be found in 2ATFME and 2ABTFME relative to 2AE. Several geometric parameters can be used to characterize the strength of an intramolecular bond. Stronger hydrogen bonds are associated with (i) increased covalent bond distance $r(O-H)$, (ii) decreased intramolecular hydrogen bond distance $r(OH\cdots N)$, (iii) a preference for a more linear angle $\Theta(OH\cdots N)$, and (iv) torsional angle $\tau(COH\cdots N)$ approaching planarity. Experimental moments of inertia obtained from Fourier-transform microwave spectroscopy of the heavy atom isotopologues of 2AE, 2ATFME and 2ABTFME have been used to determine highly precise conformational structures. The resulting structural parameters discussed above, along with those obtained from high level quantum calculations performed at the MP2/6-311G++(d,p) level and used to infer the relative strengths of the intramolecular hydrogen bond found will be discussed.

Department of Geology and Environmental Geoscience

261. Investigating Microplastics in Oysters Near Wilmington, North Carolina: Comparison of Waters Chronically Closed vs Open to Harvesting
Student Presenter: Henry Langford
Faculty Mentor(s): Barbara Beckingham

Eastern oysters, C. Virginica, serve as an important shellfishery and as ecosystem engineers. As filter-feeders, they filter up to 50 gallons of seawater per day, which exposes them to pollutants like heavy metals and microplastics. Accumulation of microplastics and heavy metals in oysters could pose risks to oyster health and may lead to transfer of these pollutants to humans and other organisms. In previous work, oysters from South Carolina were found to contain microplastics but there is a knowledge gap concerning oysters along the North Carolina coast. The main objective of this research is to investigate how microplastic concentrations in C. virginica tissues from southeastern North Carolina located in areas chronically closed to shellfish harvesting compare to oysters from higher-quality growing areas, including commercially-utilized areas. Oysters (n=10-15) were harvested at low tide under permit at 7 sites in the Wilmington, North Carolina region in October 2024. Water quality was assessed for pH, conductivity, temperature, and turbidity. Oysters were checked on-site for compliance with the 3-inch minimum-to-harvest law. Oysters were measured for length and weight, shucked and frozen. Laboratory work includes digesting tissues in strong base (10%KOH), sieving to target microplastics > 63 micron, enumeration by optical microscopy, and confirmation of polymer identification by micro-Raman spectroscopy. The goals of this research are to inform on microplastic levels in oysters for coastal North Carolina, how levels compare across sites and to global data, and oysters may contribute to dietary exposures to people and shorebird species of conservation significance in the region.

262. Spike and Seek: Method Recovery of Microplastics by Community Scientists ♻
Student Presenter: Mia DiPietro
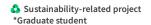**Faculty Mentor(s): Barbara Beckingham**
Additional Authors: Britney Prebis (Charleston Waterkeeper)

Aquatic environments worldwide are contaminated by microplastics, which are tiny plastic particles less than 5 mm in size. Monitoring microplastics is crucial for locating sources and developing risk assessments to guide efforts to protect ecosystems against the potential detrimental impacts of plastic pollution. However, identification and characterization techniques vary, and it is critical that method accuracy be reported for quality assessment. Several research designs exist to study microplastics in water samples, and given the need for spatially rich datasets, community science has recently been proposed as an advantageous approach. Charleston Waterkeeper, a local 501(c)(3) nonprofit organization, with College of Charleston has involved community scientists in monitoring 18 sites (as of October 2024) to expand data collection efforts and provide a more comprehensive understanding of microplastic distribution and abundance in the Charleston Harbor watershed. In one test of the accuracy of the community science protocol, this study investigates the recovery rate of microplastics in water samples by community scientists using samples spiked with 50 high- and low-density microplastic particles (25 polyester fibers, 25 polyethylene spheres) in two size classes (300-500 μm and 75-90 μm, respectively). The microplastics will be highly visible so that recovery through sample collection and processing is assessed rather than visual identification. This recovery experiment will help to assess the community science microplastic monitoring program's ability to produce actionable data that improves our understanding of microplastic pollution in local waterways.

263. Evaluating the Suitability and Perception of Wastewater Infrastructure in Residential Mount Pleasant, South Carolina ♻
Student Presenter: Maggie Garrigan
Faculty Mentor(s): Timothy Callahan

Some properties in the greater Mount Pleasant, SC area use septic systems to dispose of wastewater, though there have been opportunities for property owners to switch to the sanitary sewer system. In some neighborhoods, the sanitary sewer network is not yet available, or other barriers exist for those willing to connect to it. Geographic information systems (GIS) maps have been created of the area, and several monitoring wells have been installed at properties across the study area to discern whether the quality of groundwater has been affected by septic use. In addition, community focus groups and surveys have been planned in collaboration with Mount Pleasant Waterworks to gauge residents' attitudes and knowledge of septic systems. The goals of this poster are to communicate the perception of current wastewater treatment strategies using informal interview and community meeting data and to assess the efficacy of septic systems in affected neighborhoods based on physical and environmental conditions. We will produce an annotated map of Mount Pleasant, including descriptions of soil profiles, ground surface elevation, and distance from tidal waters at each well site. Additionally, recommendations for wastewater treatment techniques will be provided for property owner consideration.

264. Basin and Range Extension in a Continental Arc Setting: A Sr, Nd, Pb, and Hf Isotopic Analysis of Hybrid Lavas in the Poison Lake Volcanic Chain, California
Student Presenter: Ashley Grant
Faculty Mentor(s): John Chadwick
Additional Authors: Julia Sullivan

The Poison Lake Volcanic Chain is a 25-km long chain of small, monogenetic cones and flows in the back-arc region of the Lassen Volcanic field in Northern California that erupted between 100-110 ka (Muffler, et al., 2011). Lassen is part of the Cascade Arc in the Pacific Northwest and is a product of subduction of the Gorda plate beneath North America, producing calc-alkaline lavas typical of continental arcs. Basin and Range extension has expanded westward into the Lassen area, with NNW-trending normal faults and crustal thinning. Regional Basin and Range extension and crustal thinning typically produce tholeiitic lavas resulting from low-pressure melting of shallower mantle in relatively anhydrous conditions. We hypothesize that magmas produced by both processes are generated at different depths and are variably mixing in the Lassen back-arc to create hybrid magmas prior to eruption in the Poison Lake Chain. Lavas produced by these two processes have distinctive Sr, Nd, Pb, and Hf isotopic characteristics which can reveal the proportions of these two sources of magma in the lavas. We collected basalt samples from 30 of the 39 mapped flow units in the Poison The isotopic results show variable extents of magma mixing. Magma chamber simulator modeling reveals that all of the sampled flow units are not related via fractional crystallization alone, and likely reflect contributions from subduction and Basin and Range magmas variably mixing at depth leading to hybrid lava eruption at the Poison Lake Chain.

265. Volcanic Eruption Ages and Magmatic Loading at a Giant Volcano on Mars
Student Presenter: Lilianne Ross
Faculty Mentor(s): John Chadwick
Additional Authors: Abby Dunn, Tristan Luginbill and Norm Levine

Arsia Mons is one of the largest volcanoes in the solar system, with a width of 275 miles (450 km) and towering nearly 12 miles (20 km) above the surrounding plains of Mars. Arsia is a geologically young volcano, evident by the relatively few impact craters present on its surface and erupted lava flows. Over time, lava flows collect increasing numbers of craters; the number and size ranges of these impacts can be related to their surface age, revealing when the volcano was last active. This study examined the ages of lava flows from Arsia Mons to estimate when it last erupted. As part of this process, we developed and tested a Python-based ArcGIS Pro toolbox derived from a previous ArcMap crater counting tool, called CraterTools, by mapping craters with diameters greater than 10 meters and utilizing CraterStats software to estimate the flow ages. Our results show that Arsia was active from about 75 million to 400 million years ago, coinciding with young pulses of volcanic activity across the Tharsis region. This study also examined the orientations of Arsia's lava flows, some of which no longer flow in a downhill direction. We suggest these flow misalignments are caused by the addition of magma to Arsia Mons, which loaded and tilted the surrounding terrain toward the volcano. By combining the flow ages with the magnitude of tilting, we can estimate the amount of magma produced by the volcano in the past 400 million years.

266. Gap Analysis of Public School Teachers Geologic and Environmental Science Understanding ♻️
Student Presenter: Kristen Schultz
Faculty Mentor(s): Cassandra Runyon

This study will examine the educational background, confidence levels, and professional development of educators teaching Earth sciences, biology, and environmental science in South Carolina. A survey will assess academic training, curriculum alignment, and resource availability, identifying gaps in Earth science instruction and the educator teaching the topics. Educators' confidence in specific topics, such as plate tectonics and climate systems, and their engagement with professional development and sustainability training are explored and the impacts of independent training are identified. Findings will highlight challenges in Earth science education and inform strategies for improving teacher preparedness, curriculum development, and resource support.

267. Advancing Paleontological Mapping: A GIS and Drone Photogrammetry Approach to the Lance Formation near Glenrock, Wyoming
Student Presenter: William Steelman*
Faculty Mentor(s): Scott Persons
Additional Authors: Norman Levine

Geologic and stratigraphic mapping play a crucial role in paleontological field studies, enabling analyses of species distribution and ecosystem changes over time. However, traditional survey methods can be challenging in areas with complex topography and structural geology. This study demonstrates the application of Geographic Information Systems (GIS) and drone-based photogrammetry to map an exposure of the Lance Formation near Glenrock, Wyoming. Using a DJI Mavic 3 Pro drone, high-resolution aerial imagery was collected and processed into orthomosaics and digital elevation models. GIS analysis was then applied to evaluate stratigraphic relationships and identify structural features. Results confirmed the estimated stratigraphic thickness of approximately 750 meters and revealed a correlation between quarry sites and specific stratigraphic levels, suggesting environmental shifts that influenced fossil preservation. Notably, the isolated "Lady Stephanie" Triceratops skull was found at a higher stratigraphic level than other fossils, paralleling morphospecies separation trends observed in the Hell Creek Formation. These findings highlight the potential of GIS and photogrammetry in paleontological mapping, offering cost-effective, high-resolution methods to improve fieldwork efficiency and accuracy. As GIS technology becomes more accessible, its integration into paleontological research will provide new insights into stratigraphy and fossil distributions.

268. Episodic deflation events as an indicator of magma movement at Axial Seamount, Juan de Fuca Ridge
Student Presenter: Ava Stewart
Faculty Mentor(s): Haley Cabaniss
Additional Authors: William W. Chadwick Jr. (Oregon State University, Cooperative Institute for Marine Ecosystem and Resource Studies, Newport, OR), Scott L. Nooner (University of North Carolina at Wilmington, Wilmington, NC), Jeffrey W. Beeson (Oregon State University, Cooperative Institute for Marine Ecosystem and Resource Studies, Newport, OR)

Axial Seamount is an active submarine volcano 480 km offshore the Oregon Coast on the axis of the Juan de Fuca Ridge. Since the late 1990s, vertical deformation of the summit caldera has been monitored using an array of cabled, campaign-style, and continuously recording pressure sensors, providing a record of deformation spanning almost three decades. These sensors have detected three eruptions in 1998, 2011, and 2015, indicated by significant (2.5-3.2 m) deflation of the caldera as magma withdrew from a subsurface reservoir to feed dike intrusions into the rift zones and seafloor eruptions. Since the 2015 eruption, Axial Seamount has re-inflated to ~95% of its pre-eruption level. Between 2016-2019, 8 short-term deflation events (~0.01-0.04 m lasting 1-3 weeks) were observed. The origin of these episodic events remains unclear, but two possible mechanisms include: [1] magma migrating out of the main magma reservoir into a satellite magma body and/or leaking a rift zone, or [2] during interruptions of the deeper magma supply into the main magma reservoir, deflation occurs due to viscoelastic relaxation of the host rock. We use 3D temperature-dependent viscoelastic finite element models

developed using COMSOL Multiphysics 6.2 software to test these hypotheses. Specifically, we investigate the possibility that these events are related to the migration of magma out of the main magma reservoir, and calculate the volume of magma lost during each of these events. Our results provide insight into the origin of these events and constraints on the magma supply and storage system at Axial Seamount.

269. Basin and Range Extension in a Continental Arc Setting: Major and Trace Element Evidence for Hybrid Lavas in the Poison Lake Volcanic Chain, California
Student Presenter: Julia Sullivan
Faculty Mentor(s): John Chadwick
Additional Authors: Ashley Grant

Lassen Volcano in northern California is the southernmost volcano in the Cascades, which spans the Pacific Northwest and is the result of subduction of the Gorda plate beneath North America. The Lassen area is also influenced by Basin and Range crustal extension. Lassen's eruptions are predominantly calc-alkaline lavas typical of continental arcs, but Basin and Range extension produces tholeiitic lavas from anhydrous melting at shallow depths. Lavas produced by these two processes have distinctive chemical properties, particularly in their ratios of fluid-mobile large ion lithophile elements (LILE) to immobile high-field strength elements (HFSE). East of Lassen Volcano in the back-arc region lies the Poison Lake Chain, a 25-km long volcanic field of flows and cones that erupted 100-110 ka (Muffler, et al., 2011), and is an ideal location to search for potential mixing of calc-alkaline and tholeiitic lava types. We collected basalt samples from 30 flows in the chain and have undertaken a comprehensive geochemical analysis to determine their mixing proportions. The samples were prepared in CofC's High Temperature Geochemistry Lab. Sample major and trace elements were analyzed via XRF and ICP-MS. Crystal separates of olivine, clinopyroxene, and plagioclase were analyzed via electron microprobe. The results show significant trace element variability, indicating magma mixing and hybrid compositions within the chain. Isotopic analyses of Hf, Pb, Sr, and Nd further confirm mixing in samples. Modeling using Magma Chamber Simulator reveals that the lavas cannot be related via fractional crystallization alone, and must involve variable contributions from both calc-alkaline and tholeiitic magmas.

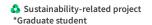**270. Geomorphology and Characterization of Coral Mounds on the Blake Plateau**
Student Presenter: Alexis Torstenson
Faculty Mentor(s): Haley Cabaniss
Additional Authors: Madie Gilles, Nicolas Haub. All co-authors contributed equally.

In summer 2024, NOAA Office of Coast Survey conducted a series of mapping cruises offshore South Carolina on the Blake Plateau to increase mapping coverage of large priority areas. Approximately 400,000 km2 of seafloor, ranging in depths from 365 to 480 m, were surveyed using shipboard multibeam sonar, revealing abundant coral mounds. We post-process data collected during these cruises to catalog each coral mound. Specifically, we generate 2D and 3D bathymetric surfaces, backscatter mosaics, and depth profiles to quantify the size, shape, depth, and substrate hardness for each coral mound, and use these metrics to categorize the mounds into two apparent types: isolated and scarp-edge. The isolated mounds are most densely concentrated in the Southeast portion of the study area, contain between one and three peaks, and have an average vertical relief of 32 m. The scarp-edge mounds form as chains of connected coral mounds which have formed along the edges of two long scarps in the Northeast portion of the study area. These coral mounds are considerably smaller, with an average vertical relief of 14 m. We hypothesize that the placement and character of these coral mounds reflect nutrient availability in the study area, largely distributed by the Gulf Stream and influenced by the morphology of the pre-existing seafloor. Results of this work have implications for identifying exploration sites for coral mounds in similar unmapped regions, and for future conservation efforts.

271. Remote Sensing of Landslides after Hurricane Helene ♻
Student Presenter: Abbey Vohs
Faculty Mentor(s): Scott Harris

Large rainfall events have the potential to cause mass slope deformation, particularly in areas that are already susceptible to landslides. Depending on their location, fast-moving landslide events can often have detrimental impacts on communities. Impacts are particularly felt in areas that are unprepared for rainfall events of this magnitude, and do not have the infrastructure in place to effectively mitigate these hazards. In the wake of Hurricane Helene, a minimum of 2,015 landslides have been reported by the USGS throughout Georgia, South Carolina, Tennessee, Virginia, and North Carolina. The majority were concentrated in North Carolina, and 1,064 of them were flagged as having impacted rivers, roads, and other structures. One technique that has proven to be effective for the mapping and monitoring of landslide events is the use of Interferometric Side-Aperture Radar (InSAR) data for a time-series analysis. This study uses SAR systems to identify landslide events in various areas susceptible to landslides around the Ashville area in North Carolina by using satellite data collected both before and after Hurricane Helene. Satellite data from Sentinel-1 will undergo terrain and tropospheric corrections so that deformation can be more accurately measured. The data are then compared with USGS data to identify any landslides that have not been identified. Monitoring areas of high landslide susceptibility in this region will be an important tool for future hazard mitigation, as well as understanding and assessing the human impact of such events.

272. The First Ceratopsian Footprints of the Lance Formation
Student Presenter: Michael Wallington
Faculty Mentor(s): Scott Persons
Additional Authors: Will Steelman

A new track site from the lower-half of Lance Formation, in Glenrock, Wyoming, is described herein. The site consists of a ceratopsian trackway (10 prints) and a lone hadrosaurian track. These tracks are referable to the ichnospecies Ceratopsipes goldenensis and Hadrosauropodus langstoni, respectively. The Ceratopsipes trackway records sequential fore and hind steps from one individual. At ## meters long, this is the longest lone ceratopsian trackway yet described. Using the standard equations of Alexander (1976) and an inferred hip height of 2.3m, the trackmaker is estimated to have been walking at a speed of 1.5m/s.

273. The Presence of Antibiotic-Resistant E.coli and Coliforms in Urban Floodwaters of Charleston, SC ♻
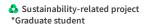**Student Presenter: Jenna Webb**
Faculty Mentor(s): Vijay Vulava
Additional Authors: Harrison Caspino, Heather Fullerton

Floodwater in coastal urban areas contains nonpoint source pollutants, but fecal coliforms resistant to antibiotics pose an additional threat to human health. In this study, tidal and rainfall floodwater samples were collected from four Charleston, South Carolina locations - three sites were impacted by tidal and rainfall flooding, and the fourth site was affected only by tidal flooding. All sites are highly urbanized, but a green buffer surrounds the tidal flooding site. All water samples were analyzed for nutrient and trace metal contaminants, coliforms, and E. coli. Coliforms and E. coli were also tested for antibiotic resistance: amoxicillin, ampicillin, augmentin, and erythromycin. All antibiotics are commonly prescribed for bacterial illnesses in humans and animals; this study analyzes antibiotic resistance patterns in coliforms as correlated to flood sources, land-use patterns, and chemical contaminants. Floodwater from all areas contained high chemical contaminants, coliforms, and E. coli. Antibiotic-resistant coliforms and E. coli were also found in all water samples. The most densely urbanized sites had the highest contamination levels, while the lone site with a green buffer had lower contamination. Coliform and E. coli concentrations correlated with rainfall, suggesting rain runoff is a primary vector for pathogen transport. Of all antibiotics, coliforms and E. coli were least resistant to augmentin. A positive correlation was observed between the percent coverage of impervious surfaces and coliforms at all the sites. Overall, the results suggest that land-use patterns increase the prevalence of antibiotic-resistant coliforms and increase the likelihood of human exposure to these potential pathogens.

274. East-West Lineaments of the Southern Appalachian Piedmont and Blue Ridge
Student Presenter: Brenton Williams
Faculty Mentor(s): Erin Beutel

Additional Authors: Abbey Vohs

The southern Appalachian Piedmont and Blue Ridge are dominated by northeast trending lineations created during the three major orogenies that formed the mountains. However, an analysis of LIDAR data show that there are also more subtle E-W lineations throughout western North and South Carolina. While small outcrop scale E-W lineations were previously identified: an early E-W fracture pre-300 Mya set in the Blue Ridge to Valley and Ridge provinces and a 200 Mya E-W fracture system associated with strike-slip faulting in the Piedmont and Coastal Plain (Bartholomew & Whitaker, 2010; Bartholomew et al., 2009). Others have noted large E-W lineations associated with the Swannanoa and Laurel Creek Lineaments (Hill, 2018). Some authors suggest that these lineaments are associated with steeply dipping reverse faults associated with Miocene block rejuvenation of the Southern Appalachians (Hill, 2018). However, given the steepness of the faults, it is likely that the E-W fracture zones existed prior to the Miocene. So which tectonic event created the E-W lineations present today? We used Global Mapper, GIS, 3DEP LIDAR data, and geologic maps to conduct initial analyses on the lineaments. Two approaches were used: large-scale mapping of locations of E-W lineations and small-scale mapping to determine age relationships. For the large-scale mapping we subdivide the region into sections with obvious E-W lineations. Age relationships are determined based on cross-cutting relationships within sections where the E-W fabric is dominant and is superseded by northeast-trending fabrics. A comparison with geologic maps will clarify any existing rock type and terrane relationships.

275. Quantifying Total Mercury in Salt Marsh Ecosystems in Charleston, SC
Student Presenter: Rebecca Wood
Faculty Mentor(s): Theodore Them

Due to sea levels increasing around the world, many coastal areas are subject to increased flooding and erosion, including salt marshes. Salt marshes are found along coastal South Carolina, spanning roughly 500,000 acres of the Lowcountry's landscape. These environments provide many vital benefits, such as habitats, nurseries, storm protection, and toxin storage. The soils found in salt marshes are predominantly comprised of clay minerals and organic matter, which creates a low-oxygen environment, allowing for certain organic and inorganic toxins and pollutants to accumulate. Daily tides and storms may erode salt marsh soils, which can result in these pollutants re-entering waterways. Mercury (Hg) is one such contaminant that represents a cause for concern due to its ability to transform into its highly toxic form: monomethylmercury (MMHg). This toxin has the ability to transport quickly through waterways and can harm animals and humans if consumed in high quantities. This project focuses on quantifying the total amount of mercury in salt marshes around the Charleston, SC region. Sediment cores were taken from the high, intermediate, and low marsh zones from different depts and analyzed for mercury concentrations. The results will be paired with a geographic information system (GIS) to provide insight into where the majority of mercury is stored in these environments. These combined results will also yield information regarding the quantity of mercury that may be mobilized as sea level rise erodes the marsh environment. These results may also provide estimates of mercury storage in analogous coastal systems around the world.

Department of Physics and Astronomy

276. Accretion Disk Split in Hercules X-1
Student Presenter: Alexander Bielicki
Faculty Mentor(s): John Blondin

Hercules X-1 is a widely observed X-ray binary system consisting of a 1.6 solar mass neutron star and a 2.4 solar mass companion star. Perhaps its most unique aspect is a 35-day cycle of X-ray flux. The best explanation for this cycle is a tilt and precession of the accretion disk around the neutron star, which periodically occludes the X-ray source. Though theories explaining the nature of tilted and precessing disks have been presented, the interaction of the tidal stream with a tilted disk is not well understood. We use three-dimensional hydrodynamic simulations on a

unique binary star grid to evolve the formation of the tidal stream from the distorted donor star, the accretion disk around the neutron star, and the dynamical interaction between the two. Once a stable accretion disk in the orbital plane is formed, we tilt the disk with respect to the orbital plane and continue the evolution. We find that the accretion disk splits into inner and outer portions each with a different rate of precession. We conduct various numerical experiments to determine if this split is caused by a torque exerted on the disk by the companion star, the interaction between the tidal stream and the disk, a combination of the two, or some other mechanism entirely. These experiments determined that the interaction between the tidal stream and the disk was the cause of the accretion disk separation, as the torque from the companion star alone caused no separation.

277. CT Image Modeling With Spline Functions
Student Presenter: Gabe Bowers
Faculty Mentor(s): DJ Connor

The goal of this project is to model CT images with B-spline functions and reconstruct these 2D spline functions into a 3D image and print this model with a 3D printer. Using standard software to reconstruct the CT images, I can represent the 3-dimensional object as a collection of spline functions. I then am able to discretize the continuous image and allow for easy creation of printable models of objects.

278. Polarization Signatures of Black Hole Accretion Disks
Student Presenter: Madeline Breiling
Faculty Mentor(s): Chris Fragile
Additional Authors: Deepika Bollimpalli (Department of Astronomy, Astrophysics, and Space Engineering, Indian Institute of Technology Indore), Jeremy Schnittman (NASA Goddard Space Flight Center)

Light is made of oscillating electric and magnetic fields; often, these oscillations have random orientations, and we say the light is unpolarized. However, sometimes, such as when light reflects off a flat surface, the oscillations orient in a particular direction, and we say the light is polarized. The Imaging X-ray Polarization Explorer (IXPE) is a new satellite designed to measure the polarization of x-ray light coming from many different celestial objects, including accreting black holes. The degree and orientation of polarization gives us information about the geometry of black hole accretion disks. In our project, we took existing numerical simulations of black hole accretion and ran them through a Monte-Carlo radiation transport code called Pandurata. Pandurata tracks many thousands of photons through the simulation domain, capturing the interactions of those photons with the matter in the disk, especially their polarization properties, ultimately producing images, spectra, and light curves. These products can then be compared to current and future observations by IXPE and other x-ray polarization observatories to gain a better understanding of the physics of black hole accretion.

279. Light Pollution Survey of the College of Charleston Campus ♻
Student Presenter: Madi Cummings
Faculty Mentor(s): Ashley Pagnotta

Our primary objective is to do experimental research by creating a new light pollution survey of the College of Charleston, specifically around the Rita Liddy Hollings Science Center Building (RITA). Light pollution is the increase in outdoor, nighttime light levels due to human activity. It affects both humans and animals, wastes energy and money, and impairs astronomical observations. RITA is the building where many classes observe during the evening and where the College's 24-inch telescope is. The 24-inch telescope is used by upper-level Astronomy and Astrophysics majors to do research projects; a better understanding of the amount of light pollution affecting their observations will help students plan their observations more accurately. We compare our data of the light pollution measurements we have collected to satellite data of the region. Although satellite data is useful because it can cover large areas more easily, it is not as precise as on-the-ground observations and has difficulty detecting newer LED lights. We used a Sky Quality Meter and a Smartphone to collect this data and transpose the data on an easy-to-read map. Additionally, we present a set of recommendations to the College suggesting adjustments to the lighting that could be made around campus to improve observing conditions and save money on long-term lighting expenses without decreasing nighttime safety for students on campus.

280. Simulating Atmospheric Mass Loss in Large, Low-density Hot Jupiters
Student Presenter: Joel Diamond
Faculty Mentor(s): Ana Uribe

Exoplanets exhibit diverse properties, with hot Jupiters being gas giants in close orbits around their stars. The intense stellar irradiation at such close separations heats their atmospheres to thousands of degrees, driving atmospheric outflows, mass loss processes that shape their long-term evolution. Understanding these outflows is crucial for studying the atmospheric structure and fate of hot Jupiters. We focus on two ultra low-density Hot Jupiters: TrES-4b and WASP-17b. Atmospheric outflows are likely to be induced in these systems because of their large radii and low density. We carry out numerical simulations using the hydrodynamics code PLUTO to model the upper atmospheres under extreme stellar radiation. The simulations account for heating and cooling processes, ionization, and planetary and stellar gravity. We calculate the structure of the escaping atmospheres and quantify the mass loss rates. These findings improve our understanding of how extreme irradiation affects low-density hot Jupiters, providing insight into their long-term evolution. More broadly, this study contributes to understanding atmospheric escape processes in the exoplanet population.

281. Developing Pr0.6Sr0.4Mn0.2Fe0.8O3-Œ¥ Solid Oxide Electrolysis Cells to Support NASA's Future Manned Missions to Mars ♻
Student Presenter: Eva Godwin
Faculty Mentor(s): Frank Chen
Additional Authors: Palmetto Academy--NASA South Carolina Space Grant Consortium

As NASA looks towards sending manned missions to Mars, reliable oxygen and returning fuel sources need to be refined. Such resources are difficult to transport, which requires the production of these resources on-site once they land on Mars. Further research is critical to NASA's Human Exploration & Operations Mission Directorate regarding the In-Situ Resource Utilization (ISRU) program. High-temperature electrolysis of carbon dioxide from Mars's atmosphere into oxygen has the potential to be utilized frequently due to its relatively low cost and high efficiency. This electrolysis is performed by a solid oxide electrolysis cell (SOEC). SOEC can be manufactured with various materials; however, perovskite-based electrode materials such as Pr0.6Sr0.4Mn0.2Fe0.8O3-Œ¥ have proved to be efficient with high current density under low voltage.
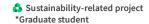
282. Utilizing ZDR Columns to Forecast the Severity of Thunderstorms
Student Presenter: Michael Maisano
Faculty Mentor(s): Lee Lindner
Additional Authors: Matt Gropp (Columbia National Weather Service), Pierce Larkin (Columbia National Weather Service), Chris Landolfi (Columbia National Weather Service)

The Columbia Weather Forecast Office investigated the application of the Dual-Polarization Differential Reflectivity, ZDR, tool as an additional means for operational forecasters to distinguish between the development of severe and sub-severe pulse thunderstorms within the National Weather Service and private industries. The research team is comprised of NOAA Meteorologists Matt Gropp, Pierce Larkin, Chris Landolfi, and NOAA intern Michael Maisano. ZDR archived radar data from 250 summertime cases in Columbia's forecast area were analyzed to compare the tool's effectiveness of revealing the vertical column updraft intensity. Generally, the stronger the updraft, the greater severity the storm will develop to be. We aim to find and establish a ZDR threshold value at the general indication the storm will be severe to increase warning lead times and warning accuracy, and to minimize false alarm warnings. Additionally, we aim to prove ZDR columns enhance a forecaster's ability to differentiate between severe and sub-severe thunderstorms to further increase severe warning lead times sent out to the at-risk area. We compared several severe warning case sets of ZDR max data to a null set of ZDR max data. The null set are cases of past false alarm thunderstorm warnings, the storm was strong but sub-severe for statistical analysis comparison. Ultimately, we aim to increase the use of the ZDR tool within the NOAA organization to improve the safety of public and protect property from high winds, hail damage, and flooding hazards associated with severe thunderstorms.

283. Late-Stage Phase Separation of Critical Point Sulfur Hexafluoride in Microgravity Experimental Data Analysis
Student Presenter: Adam Matyi-Szabo
Faculty Mentor(s): Ana Oprisan
Additional Authors: Yves Garrabos (University of Bordeaux, ICMCB), Carole Lecoutre (University of Bordeaux, ICMCB), Gurunath Gandikota (SBT, UMR-E CEA/UJF-Grenoble 1, INAC), Denis Chatain (SBT, UMR-E CEA/UJF-Grenoble 1, INAC), Daneil Beysens (CNRS-ESPCI Paris, PSL Research University)

Condensed matter physics deals with the microscopic and macroscopic physical properties of the matter that make up our world. Above a certain temperature and pressure combination, unique to each material, the material can only exist in a supercritical fluid state. This point is called the critical point. The liquid and gas interactions of matter below this point, called phase separation, have bearing on its mechanical, electrical, and thermal properties. The DECLIC experiment aboard the International Space Station observed sulfur hexafluoride (SF6) that was heated 1K above its critical point in microgravity conditions and repeatedly quenched until phase separation occurred. The full view images of the gas bubbles in liquid medium and liquid droplets in gas medium were analyzed using imaging software to determine radii evolutions. We recorded a secondary nucleation event that may offer additional insight into the progression of phase separation of sulfur hexafluoride.

284. Characteristics and statistical analysis of Hurricanes Debby and Helene as they relate to changes in wind shear and the saturation vapor pressure of water
Student Presenter: Caroline McKenzie
Faculty Mentor(s): Lee Lindner

The purpose of this study is to form a deeper understanding of the key factors that go into hurricane formation. Aspects of climate change will be considered and how that in turn may be affecting hurricane devastation, frequency, and intensity on the US East Coast. I will look at two specific case studies that have their own unique characteristics and statistics to provide me with a better interpretation of the changing wind shear as well as the saturation vapor pressure of water that both go into the intensification of hurricanes. The two specific storms of consideration include 2024 Atlantic Hurricanes Debby and Helene, both of which were individual to their paths and can ultimately be telling signs of increasing conditions in association with hurricanes.

285. Computer Vision and Mathematical Assessment of STAT3 Deletion in Cancer-Associated Fibroblasts on Angiogenesis in Pancreatic Ductal Adenocarcinoma
Student Presenter: Jacquelin Miller
Faculty Mentor(s): Alexander Brummer
Additional Authors: Samaneh Saberi and Michael Ostrowski, Medical University of South Carolina

Pancreatic ductal adenocarcinoma (PDAC) is a highly lethal malignancy characterized by dense desmoplastic stroma rich in cancer-associated fibroblasts (CAFs). Emerging evidence suggests that STAT3 signalling in CAFs is pivotal to promoting tumor initiation and angiogenesis in PDAC. This study investigates the impact of STAT3 deletion in CAFs on tumorigenesis and angiogenesis in PDAC using mathematical modelling and computer vision methods. Serial sections of pancreatic cancer tissue from mice with and without STAT3 were stained for endothelial and epithelial cells to illuminate the presence of tumors and vessels. The stained sections were scanned using the Akoya Vectra Polaris Quantitative Pathology Imaging System, generating multispectral, high-resolution images that capture detailed spatial and spectral information. To model the impact of STAT3 deletion on tumorigenesis and angiogenesis, we are investigating image features indicative of tumor morphology and vessel growth. These are: tumor/microvessel density, perimeter, area, and compactness, all measured in proximity to identified PDACs. These features were selected due to their reliability as indicators of extravasation, interstitial fluid flow, and tumor cell proliferation within the tumor microenvironment. This study aims to determine the feasibility and potential of using physical modelling in conjunction with advanced imaging techniques to assess and predict tumorigenesis and angiogenesis in PDACs. The developing model not only offers a valuable tool for studying the complex interplay between CAFs, STAT3 signalling, and tumor angiogenesis but also holds promise for developing novel therapeutic strategies targeting CAFs and angiogenesis in PDAC, giving hope for improved treatment options in the future.

♻ Sustainability-related project
*Graduate student

286. Universality Laws in Pure fluids and Critical point Experiments under Density Gradients‚Äã
Student Presenter: Ella Muschlitz
Faculty Mentor(s): Ana Oprisan
Additional Authors: Yves Garrabos and Carole Lecoutre (University of Bordeaux, ICMCB), Gurunath Gandikota and Denis Chatain (SBT, UMR-E CEA/UJF-Grenoble 1, INAC), Daniel Beysens (CNRS-ESPCI Paris, PSL Research University)

Critical fluids have properties that deviate from typical fluids; for example, while approaching the critical temperature, the fluid will become opaque and presents a divergence in power laws such as isothermal compressibility. We investigated two critical fluids in microgravity conditions, critical oxygen under magnetic levitation and sulfur hexafluoride on the International Space Station. The oxygen investigation showed that turbidity data, a quantity due to density fluctuations, can be directly obtained from image analysis of a polarized laser through a cell with a selection of windows. We fitted the turbidity to a theoretical expression and successfully estimated the isothermal compressibility and correlation length of oxygen. The SF6 project focused on the late-stage phase of SF6 in microgravity after a temperature quench from the critical point. We studied the distribution of the radius of vapor/gas bubbles as a function of time through image analysis. It was found that the distribution could be well approximated by lognormal functions and the bubbles shifted to a smaller radius over time. We observed binary coalescence events during the phase separation process and small droplets presumably generated by condensation.

287. Your Brain on Music – a fNIRS Perspective
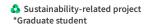Student Presenter: Rion Reynolds
Faculty Mentor(s): Sorinel Oprisan
Additional Authors: Bill Manaris, Dwight Krehbiel: Psychology Department, Bethel College

Functional Near-Infrared Spectroscopy (fNIRS) is an optical, noninvasive BOLD (Blood Oxygen Level Dependent) neuroimaging technique that measures brain activity. This technique allows for indirect monitoring of neuronal activity by observing changes in blood flow within the cerebral cortex, better known as the hemodynamic response. In recent years, fNIRS devices have led to advancements in music rehabilitation therapy by showing therapeutic benefits for certain neurodegenerative diseases such as Parkinson's. Familiarity with music has also been associated with modulating emotional and pleasant responses in the brain. We selected three music pieces with very distinctive features from different genres. The fNIRS signal should be able to distinguish between different genres. The study's goal was to design a machine-learning algorithm that can automatically classify a subject's affinity to a music genre. We created randomized trials in which each subject listened to the three pieces of music in random order. There were three subjects involved in our experiment. Data recorded using 48 optodes were stored on a computer for offline processing pipeline filtering via Homer3. Subjects found piece one (Beethoven's Piano Sonata) to be their most familiar music, resulting in more neuronal activity throughout than during the other pieces of music. Subject 002's brain appears to be the most musically conditioned, but that has not been conclusive. The goal is to identify each piece of music distinctively using fNIRS hemodynamic responses. Further data collection is necessary to train our machine-learning/artificial intelligence machine to interpret brain waves.

288. Ultraluminous X-Ray Sources: An Unsolved Mystery
Student Presenter: Garrison Rickmon
Faculty Mentor(s): Chris Fragile

My project set out to understand one of the brightest classes of steadily shining objects in the universe, so called ultra-luminous X-ray sources or ULXs. These objects are now known to consist of a neutron star or black hole pulling matter in from a companion star through what is called an accretion disk. At face value, it appears that these objects are shining brighter than should be allowed, exceeding what is called the Eddington limit. As part of my research, I conducted numerical (computer) simulations of black hole accretion disks where I purposefully tried to force the objects above this limit. What I discovered was that the accretion disk actually obeys the Eddington limit. These systems simply appear brighter than expected because most of the radiation escapes in one direction (perpendicular to the accretion disk). This work has implications for the growth of black holes over cosmic time.

289. How Does VII Behave During Storm Intensification?
Student Presenter: Donald (Trey) Rockey
Faculty Mentor(s): Lee Lindner
Additional Authors: Lauren Warner (NWS)

This experiment used MRMS (multi-radar multi-sensor) and radar data to examine VII(vertically integrated ice) during storm intensification. This will be compared to other more known variables such composite reflectivity and reflectivities at 0 and -20 degrees Celsius, vertically integrated liquid (VIL) and 60 dBz echo tops. Lastly this experiment will see how close each peak of each variable compares to how reported weather from April 20th, 2024.

290. Designing the Radiation Shielding and Control Hardware for a Modular, Lab-based Micro-CT System
Student Presenter: Dylan Simmons
Faculty Mentor(s): DJ Connor
Additional Authors: Adam Matyi-Szabo, Gabe Bowers, Stafford Yerger, Emma Williams

In this project, we have developed a modular, high-resolution Micro CT imaging system designed for teaching and research applications. It will provide undergraduate students with hands-on experience in biomedical image acquisition, analysis, and interpretation. The system was constructed using 3D modeling, fabrication, and 3D printing techniques. After passing a radiation safety inspection, the system is now operational. Further work remains, including implementing LabVIEW-based motor controls and validating the performance of the imaging system.

291. Developing Controls and Evaluating Imaging Metrics for Micro-CT System
Student Presenter: Stafford Yerger
Faculty Mentor(s): DJ Connor

We are constructing the controls for our Micro-CT system. This will be done by communicating with the detector through LabVIEW and NI-MAX. Afterwards, we will implement flat-field and dark-field corrections to ensure image quality and employ the Reconstruction Toolkit (RTK) to reconstruct the CT images into fully 3D models. Lastly, we plan to construct a phantom and use objects of known density to establish the imaging metrics of the micro-CT system, such as contrast-to-noise ratio (CNR) and spatial resolution.

Environmental and Sustainability Studies

292. The Student Sustainability Collaborative: Amplifying Student Voices ♻️
Student Presenter: Meghan Lord
Faculty Mentor(s): Kelsey Whiting-Jones
Additional Authors: Lexi Dowd

The Student Sustainability Collaborative (SSC) is a diverse and intersectional collective of student leaders, dedicated to providing consistent, efficient advocacy for holistic sustainability by connecting campus decision-makers and students. In the Spring of 2023, following the establishment of the SSC, the Student Sustainability Attitudes survey was debuted to gauge what issues matter most to students at The College. This data has since been used to guide the initiatives the SSC focuses on and serves as a vital leverage point for student advocacy. The Student Sustainability Collaborative is committed to distributing this survey biannually to keep our efforts relevant to current student needs. In 2023, students reported that (1) Justice, Equity, Diversity, and Inclusion, (2) Housing, and (3) Accessibility and Mobility were the most important sustainability issues to be addressed. The 2025 data serves to highlight the shifting concerns of the student body. The Student Sustainability Collaborative is actively

bringing students together and amplifying their voices, giving power to students to create meaningful change that every community on campus holds a stake in.

293. Comparison of USGS regional groundwater models to local scale models for decision making in Beaufort, South Carolina ♻
Student Presenter: Avery West*
Faculty Mentor(s): Norm Levine
Additional Authors: Matthew Swanson

Beaufort County Adapts brought together scientists, residents, and decision-makers to prepare for sea level rise impacts on local groundwater and infrastructure in Beaufort County, South Carolina. Focusing on septic systems, this project developed maps of present day and future depth to groundwater surfaces at a parcel scale. These high-resolution topographically constrained groundwater maps were found to match baseline groundwater elevations, established using shallow monitoring wells, to within 0.5 meters across the county. This study compares the ability of the data sets developed in the USGS's future coastal hazards along the U.S. North and South Carolina coasts projected water table depths data set with the Beaufort Adapts topographically constrained groundwater maps. The models were run with a local mean higher-high water (MHHW) marine boundary condition, and with groundwater reaching the land surface removed from the model, simulating loss via natural drainage. Modeled groundwater heads were then subtracted from high-resolution topographic digital elevation model (DEM) data to obtain the water table depths providing maps of groundwater heads / depths for both current and future sea-level rise (SLR) scenarios. This study focuses on two important outcomes: First, to determine if the USGS regional mapping can be used for helping to understand impacts of groundwater at a scale necessary for septic systems planning and failure potential monitoring. Second, to determine at what scale groundwater maps are necessary for these municipal level decisions.

Master of Science in Marine Biology

294. Diet of the Silver Perch, Bairdiella chrysoura (Sciaenidae), an Estuarine Species of the Southeastern United States.
Student Presenter: Mikayla Baird*
Faculty Mentor(s): Antony Harold
Additional Authors: Craig Plante, David Knott (Poseidon Taxonomic Services), and Bonnie Ertel (National Oceanic and Atmospheric Administration)

Bairdiella chrysoura (Silver Perch) is a secondary consumer in estuaries of the southeastern United States. Based on the literature, it preys on crustaceans, consuming calanoid copepods as larvae and early juveniles, and shifting to shrimp as they grow. Most studies on Silver Perch have small sample sizes and few focus on early life stages or its entire life history. The proposed research focuses on expanding the knowledge of larval Silver Perch diet and characterizing the diet throughout its life history; assessing ontogenetic shifts and feeding selectivity by comparing the gut contents to food resources available in the environment. Specimens will be collected through electrofishing, trammeling, and seining. Food resource samples will be collected using a fine-mesh kick-net in shallow-water. Organisms in the food resource samples and gut contents will be visually identified to the lowest practical level, and a subsample preserved in 95% ethanol will be used for DNA barcoding of selected specimens. Frequency of occurrence will be used to assess components of the diet. Comparisons of food items in the stomach to prey items in the environment will be assessed using electivity indices. Preliminary results are consistent with the literature in showing Silver Perch primarily consume calanoid copepods, particularly Pseudodiaptomus spp. as larvae and early juveniles (~7-30 mm SL) and mysid (Neomysis americana) and palaemonid shrimp as late juveniles and adults (~64-96 mm SL). The results of this study will provide greater insight into the role Silver Perch serves in estuarine food webs.

295. Proteomic analysis of plasma from rescued Kemp's ridley sea turtles (Lepidochelys kempii) exposed to light and heavy degrees of oiling from the Deepwater Horizon oil spill ♻
Student Presenter: Camille Berardone*
Faculty Mentor(s): Michael Janech
Additional Authors: Dave Owens, Ben Neely (National Institute of Standards and Technology, NIST), Nicole Stacy (University of Florida College of Veterinary Medicine)

The Deepwater Horizon oil spill, one of the largest oil spills recorded in the U.S., resulted in a loss of approximately 61,000-174,000 sea turtles. Kemp's ridley (Lepidochelys kempii) sea turtles experienced negative effects, including increased white blood cell counts, high blood glucose, and other physiological derangements. While studies assessed the impact of oiling on health variables, examination of the impact on the blood proteome remains unperformed. This study aims to compare the plasma proteome of two groups of Kemp's ridley sea turtles that were lightly [oiling category (OC) 2] or heavily (OC4) oiled, respectively, at time of admission and after successful rehabilitation. We hypothesize that there will be differences in the plasma proteome of sea turtles with light (OC2) or heavy (OC4) degrees of oiling (e.g., acute phase proteins will be higher in heavily oiled turtles) and at both sampling time points. Blood samples were obtained from sea turtles at the time of rescue (OC2: n = 9; OC4: n = 15) and after rehabilitation (OC2: n = 9; OC4: n = 15). Using protein concentrations, the plasma proteins were proteolytically digested into peptides and injected into a nano LC-MS/MS to collect spectra for analysis. Once identified, pairwise comparisons between OCs and blood collection times were conducted to classify the differences in the individual plasma proteins of lightly oiled and heavily oiled turtles. Information gathered from this study may be used to classify degrees of oiling in sea turtles or to direct future studies investigating biomarkers of oiled sea turtles.

296. Phthalate Metabolites in Urine and Blubber From Bottlenose Dolphins (Tursiops truncatus) Sampled in Sarasota Bay, FL ♻
Student Presenter: Maggie Knight*
Faculty Mentor(s): Leslie Hart
Additional Authors: Miranda Dziobak (University of South Carolina), Randall S. Wells (Brookfield Zoo Chicago's Sarasota Dolphin Research Program), Robyn Faulkner Allen (Brookfield Zoo Chicago's Sarasota Dolphin Research Program), Emily C. Pisarski (National Oceanic and Atmospheric Administration), Paul Sandifer, Christina Toms (Brookfield Zoo Chicago's Sarasota Dolphin Research Program), Edward F. Wirth (National Oceanic and Atmospheric Administration)

Phthalates are plasticizing chemicals that leach into the environment and can impact wildlife. While phthalate exposure in marine mammals has been assessed using various sample matrices (urine, blubber, liver), the comparative advantages of each remain uncertain. This study aimed to determine whether urine and blubber samples yield different exposure estimates, reveal distinct exposure patterns, or capture unique metabolite profiles. Phthalate metabolite concentrations, measured via liquid chromatography-tandem mass spectrometry, were analyzed in blubber samples from live (2016-2024, n=45) and stranded (2010-2023, n=44) dolphins and compared to studies using urine samples (2010-2019, n=51), all collected in Sarasota Bay, FL. Detection proportions were lower in blubber (live: 57.8%, stranded: 44%) than in urine (74.5%). Habitat utilization, estimated via kernel density analysis of photo-identification sighting histories, revealed that dolphins with detectable concentrations in urine and blubber exhibited larger home ranges extending into open waters, while dolphins with non-detectable concentrations were primarily found in enclosed embayments. Spatial patterns differed between sample types; dolphins utilizing the southern estuary exclusively had detectable concentrations in urine but not blubber. Metabolite profiles also varied. MEHP was the most common in both urine (54.9%) and blubber (73.3%), but MEP, the second most common urinary metabolite (29.4%), was only detected in 6.66% of live dolphin blubber samples. Among matched individuals (n=37), 32.4% had detectable MEHP in both matrices. These findings underscore the importance of multi-matrix studies, as relying solely on blubber or urine may underestimate exposure, impacting environmental risk assessments.

297. Assessing Habitat Usage and Fall Movement of Atlantic Blue Crab Callinectes sapidus in the Ashley River and Charleston Harbor, SC
Student Presenter: Adeline McCullough*
Faculty Mentor(s): Daniel Sasson

The Atlantic Blue Crab, Callinectes sapidus, is a key intermediate species in coastal ecosystems and supports an economically important fishery in South Carolina (SC), USA. Some long-term surveys conducted by the South Carolina Department of Natural Resources (SCDNR) have shown recent decreases in overall blue crab abundance, especially in fall seasons. This may be due to actual decreases in abundance or changes in when and/or where blue crabs are found, potentially resulting in surveys that do not accurately reflect the population. To combat this potential issue and better understand habitat usage of blue crab in the Charleston Harbor and Ashley River system, we used crab traps biweekly to catch and measure blue crabs in the summer and fall of 2024. Preliminary analyses show that mature females preferred higher salinity waters than mature males, juvenile males and juvenile females did not have preference for depth or salinity, and the size of mature crabs varied across a salinity gradient. These results may help us to create more accurate estimates of abundance and better manage the blue crab fishery in SC.

298. Assessing Trophic Interactions in Freshwater Communities Under the Effects of Salinization ♻
Student Presenter: Cole Miller*
Faculty Mentor(s): Allison Welch
Additional Authors: Alex Barron, Maya Mylott

With climatological, geological, and anthropogenic stressors on the rise, various freshwater ecosystems are at risk of changes in community and trophic structure. Salinization due to sea level rise, storm surge, and subsidence is a threat to coastal, freshwater wetlands. However, community and ecosystem level impacts of salinization are poorly understood. In this study, we investigated impacts of freshwater salinization at multiple, interacting trophic levels within experimental mesocosms. Algae, zooplankton, herbivorous amphibian tadpoles, and predatory odonate nymphs were used as a model coastal wetland trophic system to quantify impacts of salinization on biomass at each trophic level. We employed three salinity treatments as well as variation in tadpole density and nymph presence to isolate effects of salinization, competition, and predation. We will analyze the data using dynamic linear models to examine changes in biomass at each trophic level through time and structural equation modeling to infer interactions among trophic levels. The findings of this study will help provide a framework for understanding the impacts of salinization on trophic dynamics in vulnerable coastal systems.

299. Sponges Aren't so Boring After All - Investigating Prevalence and Infection Mechanisms of The Boring Sponge Cliona celata in Oyster Shells in Charleston, SC
Student Presenter: Piper Zola*
Faculty Mentor(s): Christopher Freeman

The bioeroding, or boring, sponge Cliona celata is highly destructive to oyster reefs in the Northwest Atlantic. With infection rates reaching 100% in some farmed and wild reefs, C. celata threatens the economic and ecological services of the Eastern oyster Crassostrea virginica in the Southeastern US. Despite this, little is known about its prevalence in Charleston, SC. Previous studies suggest C. celata spreads through shell-to-shell contact, larval dispersal, and fragmentation. However, the dominant infection mechanism in South Carolina remains unstudied. To address these unanswered questions, a survey was conducted across natural and restored reefs and data on sponge frequency among oyster shells were collected. To determine the dominant infection mechanism, an in situ experiment was deployed in the Charleston Harbor for 6 months starting in July. The percentage of shells infected due to shell-to-shell contact will be compared to those infected due to larval dispersal. Initial observations suggest direct shell-to-shell contact as the dominant infection mechanism by the boring sponge onto oyster shells during this timeframe. Results will provide critical insight into the distribution, infection patterns, and bioerosion impact of C. celata, informing management strategies to protect Charleston's oyster reefs.