
# PRESBYTERIAN COLLEGE

COLLEGE *of* ARTS & SCIENCES | SCHOOL *of* PHARMACY

# HONORS DAY SYMPOSIUM

2025

April 24, 2025

Dear PC Community,

I am tremendously excited to see the academic work and achievements of students take center stage during Honors Day. During this annual event, we recognize the exceptional work of students and we celebrate the collaborative efforts that take place between students and faculty.

PC is known for its academic rigor, and many students soar above and beyond classroom expectations. Involvement in Honors Day is a particularly strong testament to their dedication, focus, and talent.

Our students have put their hearts and souls into their research and creative work. They have pursued their passions and satisfied their curiosity in the wide variety of disciplines in the liberal arts. They have risen early and stayed up late, all in an effort to present their best work. We are proud of their many accomplishments.

Please join me in congratulating the students presenting during Honors Day and the students receiving awards today. I am grateful for the faculty who have mentored these diligent student researchers and artists.

Welcome to Honors Day!

Respectfully,

Anita Olson Gustafson

Anita Olson Gustafson, Ph.D.
President of Presbyterian College

April 24, 2025

Dear Members of the Presbyterian College Community:

It is a joyous occasion to be celebrating the scholarly and creative accomplishments of Presbyterian College students. Honors Day at PC represents the best of who we are and reflects the essence of what we do as a learning community. The academic work you will see today – whether in the form of presentations, poster sessions, or performances – demonstrate the impressive scholarly and creative activity that PC students pursue with faculty mentors in the College of Arts and Sciences, in the School of Pharmacy, and in our Physician Assistant and Occupational Therapy programs. Congratulations to all the students whose work is being highlighted today!

Students from all departments and programs on campus participate in research opportunities available throughout the year. Since a Senior Capstone or Signature Work is required for all undergraduate majors, Presbyterian College students actively explore scholarship in their chosen field. Collaborative student-faculty research is at the heart of PC Summer Fellows program, and some undergraduate students carry out Honors Research projects as part of their major. Our graduate programs are also actively engaging students in Capstone and other research projects. These scholarly experiences introduce students to the value of pursuing the life of the mind and launch them into further study and exploration for their post-PC careers.

I also want to recognize the outstanding dedication and effort of the faculty members who have served as research advisors, academic mentors, creative collaborators, moderators, and organizers for this event. Dr. Stefan Wiecki leads a talented group of faculty, staff, and students who produce this important celebration of academic work each year at Presbyterian College. Thank you for your dedication to making the magic of Honors Day happen.

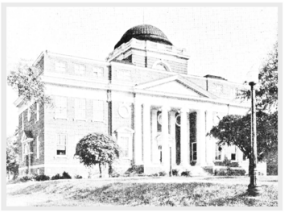
Please enjoy the 2025 Honors Day Symposium!

Sincerely,

Erin S. McAdams
Provost and Vice President of Academic Affairs
Professor of Political Science

# Honors Day Symposium

PRESENTER ABSTRACTS



Presbyterian College

April 24, 2025

## *Hangman* Theater Performance

Students from this semester's Introduction to Theater course will perform *Hangman,* their devised 10-minute play which they created as a part of their final project. Using Augusto Boal's Newspaper Theater techniques, participants developed this verbatim play using articles from a variety of media. The texts are combined to create a collage that tells the story of a high school lockdown, and they offer a compelling and devastating look at gun violence in schools. While no onstage violence occurs, this play effectively conveys the terror of experiencing a school lockdown during an active shooter drill. The performance will be followed by an question-and-answer session.

You are cordially invited to attend today's live theater performance of *Hangman*.

When: 1:00 – 1:30 p.m.
Where: Carol International House (CIH) classroom

Performers:
**Kristopher James Chickonoski**
**Cassandra Rose Gonzalez**
**Jade Hughes**
**C. Harlan Lyons**
**Annalise Morgan Maralit**
**Gracie Elizabeth Moulton**
**Joann Elizabeth Pamphilon**

## Effects of Lead Pollutant on Epimorphic Regeneration in Planaria

*Poster Presentation*

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**Sidney Margaret Adicks**
Jim Wetzel, Ph.D.
Department of Biology

The freshwater planarian, Dugesia tigrina, is widely used as a model organism in studies of tissue regeneration and in the biology of stem cell applications because of its ability to fully regenerate an entire organism from a single body segment. Planaria regenerate through a process known as epimorphosis, which leads to the formation of new tissue through blastema formation and active cell division. A blastema is a mass of undifferentiated tissue that develops into missing body parts and can be identified as an unpigmented area at the wound site. Epimorphosis also involves cell proliferation and differentiation, which rely on neoblasts, the stem cells of planaria. Lead nitrate ($Pb(NO_3)_2$) is a toxic heavy metal and a major environmental pollutant. My experiment was designed to show the effects of lead nitrate on planarian regeneration following a 24 hr. exposure to a 3 mM concentration of lead nitrate. Analysis of exposed planarian body sections revealed decreased mobility and a slower rate of blastema formation compared to a control. These findings suggest that even minimal levels of lead contamination can disrupt cellular regeneration. Given its significant impact on aquatic invertebrates, lead pollution may also contribute to larger environmental issues through biomagnification, and accordingly affect higher organisms throughout any aquatic ecosystem.

## HBot - A video game which teaches students basic programming and computer security concepts

**Cheikh Atamao**
Olivia Mambo Nche, Ph.D.
Department of Computer Science

For my project, I am developing an educational game using Unity to help players understand the basics of cybersecurity. The game revolves around the concept of cyberattacks, specifically ransomware and masquerade attacks. Players control two robots: one is a good robot and the other is a bad robot. The bad robot tries to breach the system, while the good robot attempts to defend it. For example, the good robot may pay a ransom to avoid a cyberattack. The game also includes a puzzle element, where players must choose between solving a puzzle to prevent paying the ransom or paying a high ransom fee if they fail. The main objective of the game is to offer an engaging way for players to learn about cyber threats and defensive strategies, all while making the learning process fun and interactive.

## Summer on the Greenway

**Hannah Noelle Austin**
Lynn Downie
Career and Professional Development

Over the summer of 2024, I was an operations intern at Leroy Springs and Co, specifically working at the Anne Springs Close Greenway in Fort Mill, SC. This internship introduced me to many of the opportunities available while working for a non-profit organization. During this internship I explored many facets of the organization including the children's farm, day camps for the community, events such as their summer concert series, and working with under privileged children in the community to provide them with a summer camp experience. My most notable project of the summer was creating a habitat for an African spurred tortoise at the children's farm.

## Appeasement of Hitler: Was This the Best Option or Did it Usher in World War II?

**Hannah Noelle Austin**
Stefan Wiecki, Ph.D.
Department of History

After the First World War and the decisions of the Versailles treaty, Europe was in a state of disarray. Once the hot-headed Hitler came to power and Germany started to gain back their influence, Britain and Neville Chamberlain believed that they needed to start with an appeasement policy for Hitler so they could deal with Italy, Japan, and the popular opinion of their citizens first. Once the time came, they would be able to give all their attention toward the rising issues in Germany. At that point in time, appeasement may have seemed like the best choice, and according to many historians, might have truly been Britain's only option. Through the analysis of many private conversations that included both Chamberlain and Hitler, several policy documents, letter conversations, and countless diary entries, this capstone paper will argue that this plan actually benefitted Hitler and gave him time to increase his power and influence, remilitarize Germany, and follow through with his four-year plan.

## Linguistic Synergy in Healthcare: Advancing Patient Care through Applied Spanish at the Greenville Memorial Hospital Emergency Room

*Poster Presentation*

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**Lydia Usama Awadalla**
Sharon E. Knight, Ph.D.
Department of Modern Foreign Languages

This presentation explores applied Spanish skills in healthcare during an internship with Prisma Health at Greenville Memorial Hospital. It focuses on bridging linguistic and cultural gaps, emphasizing the role of language services in improving care and equity for Spanish-speaking patients. The study reviews the hospital's Spanish services, collects data through interviews, and analyzes outcomes. Key insights include how language services enhance trust, compliance, and satisfaction. It also explores innovations like A.I. translation tools to complement interpreters. The internship showcases the importance of language accessibility in fostering inclusive care and improving patient outcomes.

## Transforming Healthcare Communication with A.I. Translation Technology-Applied Spanish in Health Care

**Lydia Usama Awadalla**
Sharon E. Knight, Ph.D.
Department of Modern Foreign Languages

This project explores the impact of A.I. translation software in healthcare settings, focusing on its potential to enhance communication and patient outcomes. Drawing from extensive experience in medical environments, including the ER, OR, retail pharmacy, and hospice care, this research addresses the need for effective translation tools. Methods include a literature review, interviews, surveys, and a case study at Greenville Memorial Hospital. Objectives include overcoming manual translation limitations, improving accuracy for dialects, and enabling seamless information exchange. The study highlights A.I. innovations like instant translation for emergencies and future technologies such as 3D holograms. Findings will be presented during Honors Day to showcase A.I.'s transformative role in healthcare communication.

What drives extremist behavior in the United States?

**Abigail Ivey Baggot**
Justin Lance, Ph.D.
Department of Political Science

Political extremism that has been on the rise for many years now. This is defined as someone who self-identifies as either extremely left or right on the political-ideological spectrum. It is hypothesized that this is because of the increase in social media that allows individuals to more readily access politically extremists viewpoints. This study examines political extremists on both sides of the political-ideological spectrum. Respondents were asked a series of questions about their social media usage while also asking questions about their political affiliation, age, gender, and education in the Pew American Trends Panel Wave 112.

## Targeted delivery of carbon monoxide: Enhancing therapeutic potential against ROS-mediated diseases

**Amanda Melissa Bailey**
Kimberly De La Cruz, Ph.D.
Department of Chemistry and Biochemistry

Direct inhalation of carbon monoxide (CO), an endogenously produced signaling molecule, is currently in various human clinical trials targeting diseases such as lung inflammation, migraines, acute respiratory distress syndrome (ARDS), and chronic obstructive pulmonary disease (COPD). For some indications such as ARDS or other respiratory diseases wherein the pulmonary capacity of patients are compromised, inhaled CO as a mode of delivery has various complications. Thus, CO prodrug/donor strategies wherein the development of stable, drug-like organic CO surrogates that will release CO in response to specific stimuli is a growing area of research. In this project, we designed and synthesized small molecules that respond to high levels of reactive oxygen species (ROS), such as hypochlorite and hydrogen peroxide. We have synthesized twelve potential CO donor molecules with an oxidizable pyrrole ring linked to an alkyne arm. In the presence of high levels of ROS, we hypothesize that the pyrrole ring is converted to a dienone which reacts with a strategically placed alkyne arm via a Diels Alder-reverse Diels Alder reaction cascade ultimately leading to release of CO. Using a reaction-based fluorescent probe for detection of CO, we found that one of the synthesized CO donors indeed releases CO in response to ROS such as hypochlorite. Structure-CO release activity relationship study is currently underway as a guide for us to design new CO prodrugs. Concurrently, cell culture studies are ongoing to evaluate the cytotoxicity of these prodrugs. Successful development of this targeted CO delivery system could have significant implications for future therapeutic strategies addressing diseases such as osteoarthritis, chronic inflammation, atherosclerosis, lung and gastric cancer.

## Deux mondes culinaires: une étude comparative entre la France et les Etats-Unis

**Chiara Barbiere**
Patrick Kiley, Ph.D.
Department of Modern Foreign Languages

La culture alimentaire contribue à définir l'identité et les valeurs d'une nation. Aux États-Unis et en France, les traditions alimentaires jouent un rôle important dans l'exposition des croyances et des habitudes communautaires. Les différences de culture alimentaire entre ces deux pays sont examinées dans ce document. Les taux d'obésité de chaque pays sont analysés en comparant les structures alimentaires, le rôle de l'Etat et les lois dans la production de l'alimentation. En comparant ces facteurs divers, l'étude analyse leurs corrélations à l'augmentation des taux d'obésité aux États-Unis et en France, découvrant comment les pratiques alimentaires et les attitudes culturelles envers la nourriture peuvent aider à maintenir des taux d'obésité plus faibles.

Food culture plays a key role in defining a nation's identity and values. In the United States and France, food traditions play a significant role in exhibiting community beliefs. The differences in food culture between these two countries are examined in this paper. Each nation's obesity rates are analyzed through the comparison of meal structures, food production, and government regulations. Through comparing these different factors, the study analyzes their correlations to the increase of obesity rates in the United States and France, discovering how dietary practices and cultural attitudes towards food can help sustain lower obesity rates.

## Ethical Hacking Virtual Lab

**Caden Joshua Barnett**
Olivia Mambo Nche, Ph.D.
Department of Computer Science

This capstone project will be a manually set up virtual lab, where one could work through ethical hacking. The lab has three main components: the virtual software, the attacking machine, and the vulnerable machine. I plan to create this virtual machine that will allow users to practice ethical hacking in a harm-free environment. In a previous class of mine, we used similar software to do the same, and in doing so we learned more about how the hacking works and how to defend better. For example, if a government organization like the FBI wants to catch a criminal, they have to get in the mind of a criminal. The same thought process goes towards cybersecurity personnel, they need to know how hackers and their softwares work. In this lab, I plan to create a lab that allows users to walk through a tutorial of how to use hacking software for ethical use.

## Creative Writing: Senior Portfolio

**Kaia Ashley Barringer**
Robert E. Stutts, MFA
Department of English

Students in Creative Writing: Senior Portfolio revise previously written pieces for a professional portfolio.

Blue Hose Field Day
*Poster Presentation*

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**Ella K. Beam**
Julie Meadows, Ph.D.
Department of Religion and Philosophy

What is community and why is there a lack at Presbyterian College? Students are involved in sports, clubs, Greek life, yet they seem to be disconnected from one another. Blue Hose Field day aims to connect students across the campus through games, food, and team challenges, building trust and friendship in one another.

## Why Mainstream Lutheran and Catholic Christians in Germany Failed to Stand Up to Hitler

**Ella K. Beam**
Stefan Wiecki, Ph.D.
Department of History

During World War Two, across Germany there was a reoccurring theme throughout Protestant and Catholic Christians—silence. Many Christians in Germany saw Nazism generally as less of a threat to their faith than communism. They regarded Jews with less sympathy than other Christians due to centuries of religious anti-Semitism prevalent in both the Protestant and Catholic Churches. Most Christians knew that their silence in the face of discrimination, deportation, and a likely death of Jews was wrong, but they were afraid to confront the Hitler regime's policies in fear of their own rights. This topic has been researched by historians but still is challenging to fully grasp the answer of why there was more silence than outcry. My main goal in this research is to understand why Christians across Germany were so silent through the injustice against Jews when faith calls for the complete opposite, which calls people of faith across the world to stand up to injustice.

## Placental Receptors Affecting Mammalian Parturition

*Poster Presentation*

**Robyn Louise Beeman**
Jim Wetzel, Ph.D.
Department of Biology

The regulation of parturition, or childbirth, is a complex physiological process heavily influenced by the endocrine system, particularly through the actions of hormones such as oxytocin and vasopressin. My study explored the roles of oxytocin and vasopressin receptors in the human myometrium, with a focus on their mechanisms of action, therapeutic potential in preventing preterm labor, and application in assisted reproductive technologies (ART), specifically in vitro fertilization (IVF).

Oxytocin, synthesized in the hypothalamus and released by the posterior pituitary, is a primary inducer of uterine contractions during labor. Vasopressin, though less prominent, also contributes to uterine contractility through its V1a receptor (V1aR). The binding affinities and inhibitory effects of oxytocin and vasopressin antagonists were studied in vitro and in vivo using animal models and human tissue samples. Results suggest that manipulating these hormonal pathways holds promise for improving labor outcomes, preventing preterm birth, and enhancing implantation success in IVF. This study underscores the importance of further investigations into the dual roles of oxytocin and vasopressin in reproductive health, with implications for developing novel therapeutic interventions.

## Taking an Analytical Approach to Solving March Madness

**Brady Andrew Bendig**
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

The men's NCAA basketball tournament, also known as March Madness, is a popular sporting event that is known for its unpredictability as there is approximately a 1 in 9.2 quintillion chance of someone predicting the tournament correctly. Even with these odds, us fans continue to trust our gut or use the eye test to determine our selections. I will be attempting to run regressions from historical data as well as individual team and player statistics to ultimately find trends and model an equation that can help determine tournament outcomes.

## Physiological Mechanism of Color Change in Chameleons

*Poster Presentation*

**Sarah Ashley Boteler**
Jim Wetzel, Ph.D.
Department of Biology

The ability to camouflage through color-change is a physiological mechanism present in multiple species of chameleon. The mechanism is known to be under neuroendocrine control, however much has been misunderstood in regards to the influence of pigmentary and structural elements on color-change. To further clarify this influence, histology, electron microscopy, and photometric videography techniques were combined. Emphasizing that change of color in reptile skin may be the result of pigmentary and structural element interactions. Specifically, the dispersion/aggregation of pigment-containing organelles within dermal chromatophores. Thermoregulation, lighting, and background color experiments were also conducted to determine typical color changes as well as rates of change. Overall, these findings provide evidence that the physiological mechanism of color-change in chameleons is physically and systematically unique in comparison to other reptiles. Suggesting evolutionary advantages of the mechanism against environmental factors and in behavioral disputes.

## Conscientious Objectors and Deserters on the Pacific Front

**David Micaiah Bouknight**
Stefan Wiecki, Ph.D.
Department of History

My proposed research project seeks to analyze and correlate the relationship between American and Japanese military deserters and/or conscientious objectors during World War II. The project will focus on the contrasting reactions of the two nations toward deserters and conscientious objectors during the time of war. Using first and secondhand accounts, journal entries, and historical film adaptations, this research project will examine how each nation responded to military deserters and conscientious objectors throughout and after World War II. The comparative analysis will explore how each nation's treatment of military deserters and conscientious objectors reflects their distinct cultural values and societal perspectives. This project will look at the untold stories of military deserters and conscientious objectors that remained buried beneath layers of institutional silence. Through suppression by both military and civilian organizations, these narratives of moral conflict stay hidden, maintaining a carefully arranged version of history that overlooks the ethical dilemmas faced by those who dared to question their role in the war. Lastly, we will look at cultural and individual perspectives of the war and how they played into the treatment of military deserters and conscientious objectors, and how this perspective shifted and changed over the course of history.

## The Identification of Bacteria for Mutagenesis Capability

*Poster Presentation*

**Reece Maclain Bradberry**
Stuart Gordon, Ph.D.
Department of Biology

Despite the ease and affordability of gene sequencing, there is still much unknown about the functions of many conserved genes (McFall-Ngai et al., 2015). One method of discovering linkages between bacterial genes and their functions is using forward genetics, such as transposon mutagenesis. Transposons are DNA sequences that have the ability to move to different locations within the genome (Babakhani et al., 2018). The specific purpose of this study is to identify strains of bacteria that are able to successfully mate with E. coli to generate gene mutations via transposon mutagenesis, a critical first step to linking genes to their function. We used TN5, a transposon on the pRL27 plasmid, which carries a gene for resistance to the antibiotic kanamycin. Different bacterial strains were mated with E. coli strain BW20767 which carries the pRL27 plasmid. Mutants were generated and first identified by their resistance to kanamycin and by Gram staining, then via 16s gene sequencing. These mutants will be further characterized via DNA sequencing to confirm the mutation and then phenotypic screens performed to determine effects of the mutations on function.

## Curating Exhibitions and Purpose at the South Pacific WWII Museum

*Poster Presentation*

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**Gabby Lucia Brinez-Pardo**
Lynne Downie
Office of Career and Professional Development

After having applied for an internship position at the South Pacific WII Museum through Presbyterian College, I had little insight into what my daily responsibilities include prior to my leaving for Vanuatu. Given that the opportunity to have been selected for this internship was an honor in and of itself, and that I had been told my main objectives would be research-related projects, I assumed I would be doing valuable yet minor assignments for the duration of my six weeks abroad. I was, however, entirely wrong. I not only had the assignment, but the privilege, to completely redesign the existing layout of the museum, create a storyline for the exhibits currently on display, create exhibits of my own, register hundreds of artifacts into the asset database, and much more. For six weeks, I had the pleasure of being trusted to be both a museum curator and archivist, though I had no prior experience doing either. This began what I can describe as nothing other than a life-changing experience. Though I did not know how this internship would go on to influence a major change in the trajectory of my life, I did have a strong suspicion that good things would come from it, and I have since learned I was right. My time at the South Pacific WWII Museum gave me much more than internship; it gave me purpose, direction, and motivation for pursuing a career in history.

# "May this testimony edify your life": Recognizing miracle work in Brazilian Pentecostal testimonies

**Patrick Alexander Buchanan**
Julie Meadows, Ph.D.
Department of Religion and Philosophy

Pentecostalism is Brazil's biggest Protestant faith and its second-largest religion in general. Pentecostal believers, or "crentes," and their churches can be found across the entire nation, from the large metropoles of São Paulo and Rio de Janeiro to the rural regions of Brazil. Crentes are also found in the "favelas," or impoverished neighborhoods on the outskirts of these metropolitan regions. In fact, a considerable portion of Pentecostals live in, or are from, the favelas. Many crentes turn to Pentecostalism when they experience various forms of suffering. Ex-criminals, ex-addicts, ex-abusers, or those simply trying to escape harsh realities convert to Pentecostalism because they find agency and meaning in the charismatic faith. This brief biography contrasts with a much more infamous biography that considers Pentecostalism to be a right-wing, intolerant, and even dangerous faith. While these troubling aspects are a reality in the Pentecostal movement, it is not integral to the life of the everyday crente or the theology they follow. Their conversion narratives, or testimonies ("testemunhos") predominantly focus on their personal or filial struggles and how the Pentecostal community or God himself changed their lives for the better. In this research I watched video testimonies from various sources and considered the various catalysts for conversion, pre-conversion narratives, and post-conversion lifestyles that crentes from across Brazil discuss. These narratives are at the core of Pentecostal self-identification and an attempt at "edifying" others' lives, whether they are a believer or non-believer. I argue that the core, and praxis, of Brazilian Pentecostalism is miracle work in its various forms. In essence, I offer an image of Pentecostalism that attempts to portray crentes in a fresh light.

## Flight, Feuds, and Tavernas: Intimacy between Slaveholder and Police Control in Pelotas, Brazil, 1880-1888

**Patrick Alexander Buchanan**
Jaclyn Ann Sumner, Ph.D.
Department of History

In response to national and international pressures, many slaveholders in Brazil freed the enslaved prior to national abolition in 1888. However, these slaveholders ensured that they did not lose control over their labor force. In Pelotas, slaveholders remained in control of the formerly enslaved through different means. One slaveholder freed his slaves but placed them under contract in order to maintain his labor force and prolong his authority. Another slaveholder freed his slaves but did not attach a contract. Legal and police authorities accepted this relationship so long as the ex-slaveholder was in control. No matter what, the formerly enslaved had to be supervised by an acceptable authority. Thus, when the population of Afro-Brazilians freed from birth grew in the last decades of slavery, the police supervised them. Criminal cases, newspapers, and government reports coupled with scholarship on Pelotas and large Brazilian cities like Rio de Janeiro, São Paulo, and Recife situate the nature of freedom and control in Pelotas during the 1880s. Evidently, the transition from slavery to freedom did not alter the authority of the slaveholder. The police found the authority of the ex-slaveholder to be not just acceptable but expected. The police intervened as a last resort.

## Comparing British Prisoner of War Experiences in Germany During World Wars I and II

**Jonathan Warner Bush**
Stefan Wiecki, Ph.D.
Department of History

My research project analyzes the experiences of British prisoners of war in Germany during World War I and World War II, comparing how they were treated by the Germans in each war. In the context of this comparison, I also consider whether or not the Germans' ideological shift towards Nazism led to a corresponding shift in their treatment of British captives. While there is existing research on British prisoners of war from World War I and World War II, no studies have sought to compare or contrast prisoners' experiences from the two wars or connect them in any way. As a result, my research makes this comparison a central focus: I analyze primary source accounts of British prisoner of war experiences from each war and compare them to determine any similarities or differences in the policies and treatment they faced in German camps. The early results of my research suggest that British soldiers actually did not experience harsher treatment in World War II than they did in World War I, and, therefore, the Nazi ideology did not appear to have motivated a shift towards harsher treatment of British prisoners of war.

## Faith, Advocacy, and Justice: Reflections from the United Nations' 69th Commission on the Status of Women

**Ella Kathryn Casto-Waters**
Emily Taylor, Ph.D.
Department of English

The United Nations Commission on the Status of Women (UNCSW) is the largest annual gathering for advancing gender equality and women's rights across the globe. As a delegate for the Presbyterian Church (USA), I participated in discussions and events addressing this year's theme: Beijing Declaration and Platform for Action. Since its publication in 1995, this document has served as a framework for dismantling structural barriers to gender equality. In March 2025, world leaders convened at UNCSW69 to review the Beijing Declaration and unveil a new action agenda. A wide range of non-governmental organizations were represented at the Commission, including the PCUSA. Working with Ecumenical Women, the PCUSA delegation advocated for policy and governmental practices that reflect our religious values of justice and peace. As progressive Christians, we are called to address human rights' issues, aiming to amplify the voices of marginalized communities. Participating in UNCSW69 is not a one-time-event, it's a commitment to education, understanding, and sharing our new knowledge with others. In this presentation, I will share my insights from my time as a delegate at UNCSW69. I will discuss the history of the UNCSW and the Beijing Declaration, explain the PCUSA's relationship with the UN, and reflect on my personal experience with faith-based advocacy work. I will share resources for learning more about gender equality and meaningful ways for individuals to help advance women's rights.

## Market Inefficiencies and the National Hockey League

**Brooke Elizabeth Chandler**
James Allen, Ph.D.
Department of Economics and Business Administration

Professional athlete performance can determine player compensation (Simmons, 2007). Market efficiency describes a market that fully reflects all of the available information (Jarrow, 2012). Reasons for the inaccuracy in prices can result from dynamics such as investor emotions, shifts in the economy, devaluing of currencies and misinformation about a company, among others. To this end, there exist inefficiencies in compensating professional athletes (Lyons & Allen, 2021). The purpose of the study was to determine the salary efficiencies in the National Hockey League's (NHL) offensive players. The results of this study showed the data to be statistically significant. There were statistically significant correlations between players salary and their offensive productivity statistics, both showing a positive relationship that greater compensation meant higher levels of offensive productivity.

## Anti-Semitism in the Weimar Republic

**Tyler Michael Chittum**
Stefan Wiecki, Ph.D.
Department of History

My paper is focused on antisemitism during the Weimar Republic which consists of the time period of 1919-1933. This was the name of Germany after World War I. The Weimar Republic helped pave the way for the rise of the Nazi regime, and while many people associate antisemitism with the Holocaust during World War II and the Nazi party, but many don't know about the start of these troubles. During the Weimar republic, Nazi influence spread throughout the whole country – in schools, churches, towns, anywhere you found people in the country you could see a shift of the country's political views. My questions are how it started, and why did it start. My goal is to shed light on the main reasons for how the Nazi regime started the Holocaust and what led up to these terrible moments in our history. I have used primary sources such as books from actual people that lived during this time period and websites that give historical details on the terrible moments in time. My findings will help better understand how antisemitism against the Jewish people started in this period of history.

## Analyzing Athlete Workload and Performance: Assessing the Impact on Performance and Injury Risk

**Lauren Elizabeth Clark**
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

Athlete workload management is essential for optimizing performance and preventing injuries. Overtraining can lead to fatigue and increased injury risk, while inadequate workload may hinder performance gains. This study aims to analyze how workload variations impact athletic performance and injury susceptibility, addressing the challenge of balancing training intensity and recovery. Employing exploratory data analysis, regression modeling, and visualization techniques in R Studio and Tableau, the study will identify optimal workload levels and predictive indicators for burnout. The findings will provide actionable insights for sports professionals, contributing to evidence-based workload strategies that enhance player longevity, reduce injuries, and improve overall team performance.

## Magnetically Induced Fluidization in Granular Materials

**Jacob K. Clerc and Donald R. Bailey**
Eli Thomas Owens, Ph.D.
Department of Physics

Granular materials are collections of athermal, macroscopic particles that can exhibit the properties of a solid or a liquid independent of temperature. The transition from a liquid-like state to a solid-like state or vice-versa is known as the jamming transition. Jamming is present in many industrial applications ranging from robotics to grain silos to pharmaceuticals. For our project, we seek to control the jamming transition of a ferromagnetic granular material (iron filings) through the application of a time varying, external magnetic field. This magnetic field is created either through the use of a permanent magnet that rotates under the granular material creating magnetic fields with sinusoidal waveforms or a system of four solenoids placed laterally around the reservoir which can create magnetic fields with arbitrary waveforms. Each setup is capable of causing the iron filings to vibrate, producing a liquid-like state for the granular material allowing us to control the jamming transition of the granular material.

# Intergenerational Trauma of the Holocaust in Jewish Survivors

**Kylee E. Crumpler**
Stefan Wiecki, Ph.D.
Department of History

The Holocaust is considered one of the darkest time periods in the history of mankind. It not only ravaged whole communities of Jews, but it left lifelong psychological impacts among survivors. This horrific event resulted in the murder of six million Jewish people by the Nazis and their allies between 1941 and 1945. Alongside the Jewish victims, millions of others, including Romanian people, people with disabilities, political prisoners, and other targeted groups, were also persecuted and killed. Driven by an ideology of hatred and racial superiority, the Holocaust destroyed families, communities, and cultures, leaving a permanent mark on the world. A mark that was and is truly irreversible. For survivors, the suffering did not end when the war was over. The trauma of losing loved ones, enduring inhumane conditions, and witnessing unimaginable amounts of deaths continued to affect them for the rest of their lives. Many survivors struggled with mental health challenges such as PTSD, depression, anxiety, and survivor's guilt. These effects didn't stop with the survivors themselves because also children and grandchildren often felt the weight of this trauma as well, carrying forward the pain, silence, and responsibility to remember. The psychological impact of the Holocaust is a reminder of the lasting consequences of such events and how deeply they shape individuals and future generations. Though the Holocaust can be looked back on as a single event in history, it also can be seen as a never ending experience and cycle for generations of Jews who have gone through such tragedy.

## The Most Valuable Offensive Player in PC's Division I Era

**Amman Elijah Dewberry**
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

In college baseball there is a lack of advanced statistics. This deficiency hinders the ability to find the most valuable players on the field. This project will be calculating advanced batting statistics to determine the most valuable offensive player in PC's D-I era. In college baseball, most fans look at batting average, on base percentage, or home run total to determine the best player on a team. While those statistics are important, they do not tell the whole story. At the major league level there is constant development and research to create and adjust advanced statistics to correctly determine a player's value. The most popular metric is Wins Above Replacement (WAR). This statistic estimates how much a player has contributed to his team in a given year, measured in terms of wins and compared to what a "replacement-level" player would contribute. WAR accounts for all facets of a player's game including not just batting, but baserunning and fielding as well. The calculation of WAR consists of many different advanced stats including runs created (RC) and weighted on base average (wOBA) which is what will be used in this project. In addition to determining the most valuable players in PC's history, there will also be analysis determining how these advanced statistics correlate to overall team success.

## The Business of Sustainability: Examining the Relationship Between Sustainability Ratings and Financial Performance in the Apparel Industry

**Sarah Elise Dieffenderfer**
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

This study investigates the relationship between sustainability ratings and financial performance in publicly traded apparel brands. Using Good On You and the Fashion Transparency Index, the research examines whether companies with stronger sustainability ratings demonstrate superior financial outcomes, measured through revenue, gross profit, and return on assets (ROA). By compiling and analyzing a dataset of well-known apparel brands, this study seeks to identify potential correlations between sustainability efforts and financial success. Findings will provide insights into whether corporate sustainability initiatives translate into tangible economic benefits, offering valuable implications for investors, brand managers, and policymakers in the fashion industry.

## The Evolution of African American Political Representation

**Braylen Jarrod Dixon**
Justin Lance, Ph.D.
Department of Political Science

This capstone project examines the evolving political affiliations of African Americans, focusing on the subset that aligns with the Republican Party. Historically, African American voters supported the Republican Party during Reconstruction but shifted to the Democratic Party in the mid-20th century due to civil rights advancements and policy changes. Despite this trend, some African Americans continue to identify as Republicans. This study seeks to answer the research question: "What drives African Americans to join the Republican Party?" By analyzing American National Election Studies (ANES) data, the project investigates the hypothesis that economic opportunities and conservative social values are primary motivators for this political alignment. The findings aim to provide a nuanced understanding of the factors influencing African American political affiliations, offering insights into the complexities of political identity within this community.

## A Tree to Remember

*Poster Presentation*

**D'Andrevius Jhabari Dorsey**
Julie Meadows, Ph.D.
Department of Religion and Philosophy

Sadly, Hurricane Helene destroyed many trees on campus. As a result, our campus has been left with many locations that appear more empty and less inviting than before. To address this issue, I propose a dedication ceremony to trees. Its purpose is to emphasize the importance of our plants on campus. Without the vibrant flowers and towering trees, what defines our campus identity beyond Neville Hall? I aim to connect student athletes, students in other social clubs, and regular students and faculty who feel left out of campus community events. My project will be ongoing, even after completing the assignment in class and graduating. It will persist through the process, despite the challenges of flower death and maintenance. The main focus is the tree, which will sustain the project. It will grow daily for the rest of my life and beyond, leaving a lasting legacy of all who participated.

## Ionic Liquid-Coated Gold Core Polymeric Nanoparticles for Targeted Photothermal Treatment of Endometriosis

**Lauren Taite Driggers**
Caleb Tatebe, Ph.D.
Department of Chemistry and Biochemistry

Endometriosis is a chronic inflammatory disease where the endometrium grows outside of the uterus, affecting approximately one in ten women worldwide. Current methods of treatment include hormonal therapy, surgery, and pain management, although there are currently no effective, long-term therapeutic methods. This study explores the use of ionic liquid (IL)-coated gold core polymeric nanoparticles (NPs) as a photothermal agents for targeted treatment of endometrial endothelial (12Z) cells. Neutrophils make up the majority of white blood cells, which act as the primary "first responders" to infection and inflammation in the body. Endometriosis patients tend to have higher than normal levels of neutrophils, due to the inflammatory endothelial tissue. Therefore, in this study, gold core NPs were synthesized and coated with neutrophil-selective ILs to selectively accumulate at the endometrial site. The synthesized NPs were characterized via Dynamic Light Scattering (DLS), zeta potential measurements, 1H NMR and absorption spectroscopy. The in-vitro photothermal efficacy of Au-PLGA-IL NPs was tested towards the 12Z endothelial cell line using an 808 nm NIR laser (1W/cm2 for 5 min). Live/Dead cell kit and Apoptosis/Necrosis assay were performed to study the cellular death mechanism post-photothermal treatment via confocal microscopy and quantified via fluorescence-activated cell sorting (FACS). Future studies include in-vivo models to determine NP trafficking throughout the system.

Hyperbaric Oxygen Treatment
*Poster Presentation*

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**Lorenzo Curtis Duren**
Jim Wetzel, Ph.D.
Department of Biology

Nuns Hyperbaric Oxygen Treatment (HBOT) can assist the healing of diabetic foot ulcers by promoting angiogenesis and fibroblast development. The purpose of my research was to clarify and understand the molecular mechanism of hyperbaric oxygen treatment that promote wound healing in diabetic patients. HBOT activates the mediators of several angiogenic genes: Hypoxia-Inducible Factor (HIF-1a), Stromal Derived Factor (SDF-1a), and Vascular Endothelial Growth Factor (VEGF) which collectively promote angiogenic endothelial cell division and fibroblast growth. HIF-1a signaling was shown to be activated by HBOT which then activated VEGF and SDF-1a in fibroblast division and expression of VEGFR/$CXCR_4$ in endothelial cells. The risk of amputations is lower in patients who have undergone HBOT. Research suggests that there is a new mechanism for targeting diabetic foot ulcers (DFU) by targeting HIF-1a which can spark new treatments for diabetic patients.

## Ligand displacement- and de novo-based approaches for fluorescent carbon monoxide detection and monitoring

*Poster Presentation*

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**Lasha Facey**
Kimberly De La Cruz, Ph.D.
Department of Chemistry and Biochemistry

Fluorescent CO probes are useful tools in the study of biologically relevant concentrations of CO. Various designs of these probes have been described in the literature, for example HFCO-1 and CODP-102. HFCO-1 is a palladacycle based turn on probe which relies on CO binding to Pd and subsequently releasing benzimidazole benzoic acid, a fluorescent molecule. CODP-102, another Pd-based probe, relies on a de novo construction of fluorophores. In this project, HFCO-1 and CODP-102 were synthesized, characterized, and compared. HFCO-1 was synthesized via two steps while CODP-102 was synthesized via five steps. Based on the fluorescence studies, both probes were turned on in the presence of CO. However, CODP-102 was more sensitive and exhibited lower background fluorescence. Furthermore, CODP-102 required a higher excitation wavelength and exhibited green fluorescence, indicating that CODP-102 will be more appropriate for biological purposes. With these findings, CODP-102 will be utilized for evaluating a small library of potential hypochlorite-activated CO prodrugs designed for CO targeted delivery.

## Exploring the Interplay between Mental Health and Addiction

**Mallory Ann Fletcher**
Carla Hall Alphonso, Ph.D.
Department of Sociology

Mental health disorders and addiction often go hand in hand, making treatment a complicated and challenging process. Many people struggling with one issue also face the other, which creates a condition known as "dual diagnosis." This combination typically leads to worse outcomes, such as more intense symptoms, higher relapse rates, and long-term challenges that are harder to overcome. With conditions like depression, anxiety, PTSD, and bipolar disorder becoming more common alongside addiction, there is an increasing need for treatment approaches that address both issues at the same time. This study aims to explore the most effective interventions for adults dealing with both mental health disorders and addiction. By reviewing existing research, examining real-world case studies, and assessing integrated treatment programs, the study will identify which approaches—whether they involve medication, therapy, or holistic methods—are most successful in treating both conditions together. The research is driven by the growing recognition of integrated treatments that take a more holistic approach to care. The findings will help inform more personalized recovery plans, focusing not just on clinical treatments but also on building emotional resilience, enhancing coping skills, and strengthening support networks through family therapy and peer groups. Given the rise in mental health and addiction rates, further complicated by events like the COVID-19 pandemic and social isolation, this study is both timely and crucial for advancing more effective treatment models.

## The Impact of Medical Advances During WWI and WWII on Mortality Rates: A Lasting Legacy in War and Civilian Healthcare

**Ashley L. Flynn**
Stefan Wiecki, Ph.D.
Department of History

This presentation explores how medical advancements during World War I and World War II shaped the future of both military and civilian healthcare. Innovations such as antiseptics, blood transfusion techniques, antibiotics, and advancements in surgical methods improved the survival rates of wounded soldiers and revolutionized emergency medicine, trauma care, and public health practices. The widespread use of antiseptics reduced infections, while the development of blood banks and transfusion techniques saved countless lives on and off the battlefield. Antibiotics like penicillin marked a turning point in treating bacterial infections, drastically reducing the complications that had previously led to high mortality rates. Additionally, advancements in triage, surgical techniques, and rehabilitation redefined the approach to trauma care, influencing modern medical practices worldwide. These breakthroughs demonstrated the ability of medical science to adapt rapidly under pressure, leaving a lasting legacy in healthcare that extends far beyond the scope of wartime.

## Manipulation of Blowfly Metamorphosis Using Ligation

*Poster Presentation*

**Aydon Kimbrell Franey**
Jim Wetzel, Ph.D.
Department of Biology

An obligatory feature of insect morphology, metamorphosis, is the final stage of insect development in which juvenile organisms reach somatic adulthood. This process exists in two forms: holometabolous and hemimetabolous. Holometabolous metamorphosis is a four-stage process that consists of a complete morphological change. To explore this complete process further, the metamorphosis of blowfly larvae (Calliphoridae) was manipulated by changing the levels of corresponding hormones using a ligation technique. Juvenile Growth Hormone (JH) and Ecdysone were the targeted hormones as they control the metamorphosis process. The Corpus Alata synthesizes JH and is responsible for the beginning of this morphological change when levels of JH decrease in the body. Ecdysone, responsible for the death of larval somatic tissue, is activated when JH levels decrease within the body cavity. Ligation of the larval body towards the anterior head restricts JH, resulting in early metamorphosis of the body and disproportionate head-to-body ratios. The ligation technique was applied to fifty larvae and was observed until metamorphosis was completed. Measurements of head-to-body ratios were recorded after pupation, and pictures were taken at the beginning and end of metamorphosis. Results were compared to untreated larvae and variations between adult morphological sizes were also compared. We found quantitative differences between the anterior and posterior regions of untreated and treated specimens in both pupate and adult forms. We found the relationship between JH, Ecdysone, and the metamorphological process to be in agreement with past studies.

## The Impact of Divorce on Foster Care Children

**Luke Gibson**
Carla Hall Alphonso, Ph.D.
Department of Sociology

The purpose of this study is to look into the relationship between foster parents' marital status and the chance that foster children would receive an emotional disorder diagnosis. Data will be gathered from two main sources, the Adoption and Foster Care Analysis and Reporting System (AFCARS) and the National Data Archive on Child Abuse and Neglect (NDACAN) #274, using quantitative approaches. In particular, AFCARS case study #22 – which focuses on emotionally disturbed cases – will be analyzed in conjunction with Dataset #133, which investigates the utilization of mental health services by young people aging out of foster care between 2001 and 2003. The sample comprises 406 youth in the Missouri foster care system, interviewed near their 17$^{th}$ birthday and subsequently every three months until their 19$^{th}$ birthday, with a shown 80% retention rate at age 19. Statistical analysis will be utilized through descriptive statistics and chi-square tests to explore relationships between variables. According to the study, foster children raised by married couples are expected to exhibit lower rates of emotional illnesses than foster children raised by divorced parents. The goal of this research is to further knowledge on how foster families' dynamics affect the mental health of their children, which could lead to the development of support networks and interventions for this vulnerable demographic.

## The Shift in Nazi Propaganda Following the Fall of Stalingrad

**Ethan Haskell Hall**
Stefan Wiecki, Ph.D.
Department of History

Under the leadership of Joseph Goebbels, the Nazi party was able to craft a narrative of an unbeatable German army. Following the surrender of The German Sixth Army at the battle of Stalingrad on February 2nd, 1943, the Ministry of Propaganda and Public Enlightenment altered the messaging of Nazi propaganda. The message changed from an invincible nation unifying itself to a message of protecting Europe and the need for total war. Many Germans felt disillusioned after the fall of Stalingrad, and the Ministry of Propaganda and Public Enlightenment saw the need to change their messaging. Many of the changes included women portrayed in fields being in factories, soldiers were now martyrs, and the main threat was that of the Jewish communists destroying Europe. The fall of Stalingrad was a critical turning point during WWII, and the battle would signal a significant change in the messaging of Nazi propaganda that would lead to the devastating result of total war.

## Improvement of Equine Assisted Therapy Sessions Incorporating Trauma-Informed Care in Pediatrics Who Have Traumatic Experiences

**Krissy Laura Harrelson**
Monica Keen, OTD, OTR/L
Occupational Therapy Doctoral Program

Research has shown that equine-assisted therapy is an effective multimodal intervention that integrates multiple contexts into a single therapy session. The age of 9-12 is an essential developmental stage in children. Post-traumatic stress disorder symptoms are specific for children within this age range. Research indicates that when considering the specific post-traumatic stress disorder criteria, trauma-informed care (TIC) has been found to be effective. However, there currently is no data supporting the combination of equine-assisted therapy and TFC as an effective treatment method for addressing the symptoms of post-traumatic stress disorder in pediatric patients. Therefore, the purpose of this project is to determine the effectiveness of Occupational Therapy intervention combined with TIC and equine-assisted therapy to improve overall impact of symptoms in children who have experienced a variety of complex trauma experiences.

## African American Soldier Experience in World War II

**Jaydn Harris-Ervin, Jr.**
Stefan Wiecki, Ph.D.
Department of History

In this presentation I will be discussing how African American soldiers were treated during and after World War II. I will argue that not only was it all bad for African American soldiers during the war, but there was also some things that were good for them and leading them in the right direction to better progress the world and military for blacks. I will use information found from African American soldiers who were a part of World War II, people who have already researched my topic, and information from classes. Some key findings that I have found on my topic is that these African American soldiers were treated bad in various ways in the military and even back home post war. After World War II new laws and groups who were fighting for the uplift of equality in society and the military were established that didn't help the black veterans, but helped the future black soldiers to come so they won't have to experience what the veterans did. The significance of my findings will help better understand what African American soldiers had to endure not only with slavery, and other key motives that shows how wrongfully the black community were treated, but also show what it was like in the military, during World War II, and also what it was like for them back home post war. African American soldiers were treated poorly throughout history and still is today, but not really as bad as back then, but my research will give an insight of all the wrong , and unnoticed recognition that the black community didn't get when all they wanted was a fair chance at life and opportunity just as the whites.

## Finding Your Future Internship with University of South Carolina's School of Medicine

*Poster Presentation*

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**Madeline Rose Hart**
Lynne Downie
Office of Career and Professional Development

The Finding Your Future internship is a competitive four week program sponsored by the University of South Carolina School of Medicine-Columbia and Prisma Health Midlands. I had the opportunity to spend each week shadowing different specialities, which included: family medicine, emergency medicine, obstetrics and gynecology, general neurology, and stroke neurology. In addition, Fridays at USC's medical school were transformative, from the anatomy lab to simulation labs, ultrasound training, and mock interviews with the faculty. Each experience deepened my understanding of what it takes to become an exemplary physician while also cementing my desire to pursue medicine.

## The Artificial Placenta and Womb: Application in High-Risk Pregnancies

*Poster Presentation*

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**Madeline Rose Hart**
Jim Wetzel, Ph.D.
Department of Biology

Despite ongoing technological advances in the medical field, pregnant women and preterm babies are disproportionately affected by the lack of resources available to them. Furthermore, there are significant sociological and genetic factors, such as being an African American woman or having high blood pressure, that make some mothers more likely to give birth early. This means that any pregnancy could become high-risk, leading to an increase in morbidities and mortalities. The development of an artificial placenta and womb has created a new option for preterm babies beyond critical intensive care. Previous studies suggest that there is potential for artificial technology to be used after preterm birth, but because of ethical limitations, research has been confined to non-human subjects. The methods used were an intense analysis of the most cutting-edge and recent publications regarding this topic. Results show that the ethical dilemma of bringing this research to a clinical setting would likely be more difficult than the creation of the technology itself. Overall, more research needs to be done to learn about the effects of sustaining the life of a fetus.

## Financial Struggles of College Students

*Poster Presentation*

**Jamahri Deshaun Harvey**
Carla Hall Alphonso, Ph.D.
Department of Sociology

College students' financial difficulties have a big influence on their general well-being, mental health, and academic achievement. Examining both the short-term and long-term impacts, this study investigates the connection between financial stress and a number of student outcomes. The study's independent variable is college students' financial hardship, which is gauged by things like living expenditures, tuition debt, and financial resource accessibility. Dependent variables are social well-being (measured by students' social engagement and relationships), mental health (measured by stress and anxiety levels), and academic success (measured by GPA). The purpose of this study is to ascertain how various degrees of financial hardship affect students' social interactions, mental stability, and academic performance. Understanding these dynamics will help the study provide insights into how student support programs, mental health services, and financial aid policies can be better adapted to lessen the difficulties faced by financially struggling students, ultimately enhancing their success and college experience.

## Creative Writing: Senior Portfolio

**Samantha Alexis Hauff**
Robert E. Stutts, MFA
Department of English

Students in Creative Writing: Senior Portfolio revise previously written pieces for a professional portfolio.

## Propaganda During Nazi Germany

**William Lawson James**
Stefan Wiecki, Ph.D.
Department of History

For my project, I looked at the effects that propaganda had on Nazi Germany. To find most of this research, I have used first-hand and second-hand sources, most being able to be found on calvin.edu in their German propaganda archives. I have also read and cited many parts of the book *State of Deception: The Power of Nazi Propaganda* by Steven Luckert and Susan Bachrach. The goal of my research is to focus on the techniques and strategies employed by the Nazi regime to manipulate public opinion. This study analyzes how propaganda shaped societal beliefs, reinforced totalitarian ideologies, and justified acts of aggression and horror. I will also be shining light on how this propaganda promoted antisemitism, nationalism, and militarism. Another important part of my capstone project will be to evaluate the psychological and social consequences of this propaganda on both individual citizens and the collective consciousness of Germany. The study wraps up by showing that Nazi propaganda wasn't just a political tool; it was a powerful force that deeply impacted the values and culture of German society. It played a key role in helping the regime stay in power and push its goals of territorial expansion and racial purity. By looking at the long-lasting effects of these propaganda efforts, this project emphasizes the dangers of government-controlled messaging and how it can change the way people think, believe, and behave.

## Legacy of World War I and its Influence on World War II, Comparing Germany and France

**Gavin Drake Johnson**
Stefan Wiecki, Ph.D.
Department of History

This presentation compares and explains strategies taken by France and Germany throughout World Wars I and II. Advances in technology and strategies going into World War II were highly advanced compared to World War I. Through this time, Germany and France were two different nations whose strategies and military advancements were very much different compared to each other based on their preparations. During this period, France and Germany approached war planning differently. France was prepared to repeat how World War I went, while Germany took its tactics to another level and prepared for a new way of how wars would be fought. These two different tactics on the spectrum will give the best comparison. Throughout the presentation, I will be going through different secondary and primary sources deciphering the authors' take on the event or source of what has happened and explaining my take on what happened based on the author's account and the primary source's accounts.

## Quantifying microbial activity and its implications on soil health and composition across a Carolina Bay Wetland

**Samuel Johnson**
Michael O. Rischbieter, Ph.D.
Department of Biology

The Janet Harrison High Pond Preserve (JHHPP) near Monetta, South Carolina is a tract of land established by the SCDNR to protect this unique Carolina Bay habitat. The Ogeechee soil that underlies the bay has characteristics that are substantially different from the Dothan series soils that surround the bay. In this study, seven soil samples were collected from the JHHPP and adjacent areas in order to determine the physical and biochemical characteristics of the soils. All soils were found to be slightly to moderately acidic, containing trace amounts of nitrogen and phosphorus. Higher levels of potassium were seen among soil samples collected within the bay and much lower outside of it. All soils were then classified using Fluorescein Diacetate Hydrolysis. Fluorescein amount was measured using a spectrophotometer and compared to a standard curve to determine microbial activity. The results indicate the presence of a unique soil ecology found within the JHHPP. This suggests that one of the endangered plants within the bay, Harperella nodosa, may have taken advantage of the microbial activity within the soils of this unique habitat as a part of its adapting to the poorly drained, moderately permeable soils in the bay.

## Effects of Lithium Chloride on Head Versus Tail Regeneration in Lumbriculus

*Poster Presentation*

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**Courtney Nicole Kirby**
Jim Wetzel, Ph.D.
Department of Biology

Lithium chloride (LiCl) is a chemical compound widely used in pharmaceuticals as mood stabilizers to treat bipolar disorder, acute brain injuries, and other neurodegenerative diseases, battery production, and other industrial operations such as the production of lithium metal and automobile parts. This pollutant has the potential to become a serious contaminant in freshwater ecosystems and can affect organisms at many trophic levels through the phenomenon of biomagnification As such, the increasing concentration of lithium raises an environmental concern about detrimental effects on aquatic organisms that contribute to the health and sustainability of ecosystems. My research investigated the impact of lithium chloride on the regenerative abilities of Lumbriculus, a freshwater oligochaete known for its ability to regrow lost body parts. I specifically studied how 24-hour exposure to a sub-lethal concentration of LiCl (5 mM) influenced the rate and success of head versus tail regeneration. Regeneration was analyzed over a designated period by observing and photographing new tissue formation and the restoration of normal body function. It was observed that in some cases, the exposure to LiCl caused malformation of the regrowing head in later stages of regeneration, while there seemed to be little to no observed effect on the reformation of the tail. Given the rising levels of lithium contamination from wastewater discharge and industrial runoff, these results highlight the need for further research and possible consideration for new environmental regulations. These findings provide insight into the sub-lethal effects of lithium on Lumbriculus, contributing to a broader understanding of its ecological risks for other freshwater invertebrates.

Langston Construction Outstanding Internship
*Poster Presentation*

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**Rebecca Marie Knight**
Lynne Downie
Office of Career and Professional Development

As a Human Resources Assistant Intern at Langston Construction Company in Piedmont, SC, I have gained hands-on experience in various HR functions under the mentorship of Mary-Allyson Chauvin. My role involved assisting with employee onboarding, maintaining personnel records, and learning the day-to-day operations of Human resources. Through this internship, I have developed a deeper understanding of HR best practices, workplace compliance, and employee relations within the construction industry. Working with a great mentor has helped me understand how HR influences and supports a strong, organized workforce.

## Artificial Intelligence in Financial Accounting

**Rebecca Marie Knight**
Karen Mattison, M. Acc., CPA
Department of Economics and Business Administration

This study investigates the impact artificial intelligence (AI) has in financial reporting by researching a type of artificial intelligence called generative artificial intelligence (GenAI). This study encompasses an exploration of artificial intelligence's advantages, risks, and an examination of its accuracy when applied to financial-related questions. We will research this by asking questions from a financial textbook to see if artificial intelligence answers correctly and efficiently. We will also survey accounting firms and industries to get some insight into their experience with the new practice of using artificial intelligence in their workplace.

## Understanding the Coordination Chemistry of Tellurium Supported by Redox-Active Ligands

**Rivers Buchanan Krask**
Caleb Tatebe, Ph.D.
Department of Chemistry and Biochemistry

Tellurium (Te) as a central atom was studied and observed because its bonding nature is not fully realized. Tellurium is classified as a metalloid because of how it has the properties of both metals and nonmetals. The use of redox-active ligands with Te(IV) ions has recently been proven to aid in the separation and isolation of Te from a mixture of other metals. Experiments and laboratory methodologies were undertaken, including the isolation and purification of both inorganic and organic substances, alongside the handling of air-sensitive materials. This research will bring a greater understanding of tellurium as the central atom in inorganic complexes. These were carried out by inorganic and organometallic techniques and characterized using nuclear magnetic resonance (NMR) and infrared (IR) spectroscopies. The research presented in this study has elucidated certain behaviors of tellurium when interacting with redox-active ligands, specifically 3,5-di-tert-butylcatechol. In most experiments, noticeable color changes was observed because of the movement of electrons within the complex, specifically the ligand. In the primary experiment, 3,5-di-tert-butylcatechol was used in toluene to synthesize an orange Te(dtbc)2 complex. This in total has led to more knowledge and ideas of how tellurium behaves as a central atom with redox ligand.

## Do Internships, GPA, and University Ranking Really Influence Job Offers? An In-Depth Analysis

**Eaint Kyal Syn Lynn**
Suzie Smith, Ph.D.
Department of Economics and Business Administration

This research examines various influencing factors to identify which aspects contribute most to career success and job satisfaction. The dataset "Education & Career Success" by Adil Shamin contains records of 5,000 students from seven fields of study: Computer Science, Medicine, Business, Engineering, Arts, Law, and Mathematics. Using Python, this study explores the relationships between variables through methods such as mean, mode, bar charts, line graphs, and proportions. The results show that university GPA significantly influenced the number of completed internships, with top-ranking students (1-400) completing the highest number of internships. On the other hand, students ranked 600-1000 tended to receive more job offers. Interestingly, university GPA, internship completion, certifications, and project experience did not have a significant effect on job offers overall, but were more beneficial for specific fields. The findings suggest that career success is not solely determined by internship completion, certifications, and project experience, as often assumed. Instead, factors such as university ranking, age, and field of study are more influential in determining the number of job offers.

## The Interplay of tra·2(mx) and fem·3(gf) Gene Mutations in Nematodes

**Isabel D. Manders-Lamcken**
Caleb Tatebe, Ph.D.
Department of Chemistry and Biochemistry

The objective of this study was to investigate the interplay between tra-2(mx) and fem-3(gf) gene mutations in Caenorhabditis briggsae and their role in sex determination and development. C. briggsae serves as an excellent model organism due to its well-characterized genetic background and rapid life cycle. The study aimed to understand how regulatory mutations influence TRA-1/Gli protein function and whether these mutations result in developmental defects. To explore these interactions, engineered mutations in C. briggsae were analyzed through genetic crosses, PCR reactions, and acrylamide gel analysis. The study examined phenotypic changes in double mutants carrying both tra-2(mx) and fem-3(gf) mutations, particularly focusing on developmental abnormalities, survival rates, and sex-specific defects such as intersexuality and vulval malformations. The working hypothesis was that the combined presence of these mutations would disrupt the regulatory mechanisms of TRA-1/Gli protein, leading to severe developmental defects and potential lethality in XX individuals. Results confirmed that double mutants exhibited high rates of lethality, somatic intersexuality, and vulval development anomalies, suggesting that precise regulation of TRA-1/Gli is critical. These findings have broader implications for understanding how mild genetic alterations in transcription factor regulators may contribute to human transcriptional regulation, particularly in developmental disorders and cancer progression.

## Enhancing Christian fellowship through the utilization of Wyatt Chapel

*Poster Presentation*

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**James Carlton Marler**
Julie Meadows, Ph.D.
Department of Religion and Philosophy

Presbyterian College is home to several on-campus Christian ministries. While the method of practice may vary between organizations, each Chirstian ministry shares the common goal of exploring faith and bringing glory to the kingdom of God. Unfortunately, a variety of practices can lead to a disconnect between Christian RSOs (Resgistered Student Organizations), with few opportunities to celebrate the diverse success each ministry has to offer. In light of this issue, I have designed an event that not only brings together students of all campus ministries, but also advertises an often-overlooked space of worship that can be shared between organizations. Through hosting a "Walk of Prayer to Wyatt Chapel," the Christian community on campus is strengthened with shared fellowship, prayer, and an encouraging invitation to Wyatt chapel.

## Fastball Expectancy Rate and Pitch Tendencies of Big South Opponents

**Mason Polk McDaniel**
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

In the game of baseball, hitters and pitchers are constantly trying to gain an advantage over one another. Many times as a baseball player, you will hear coaches say something like "sit on the fastball." That is because generally, the fastball is the easiest pitch to hit. MLB teams will have tendency charts that basically show in a specific situation (count, batting order, inning, etc.) what pitch is most likely to be thrown. At Presbyterian, we do not have in-depth data analysis charts on our opponents. I will analyze previous at-bats and create charts and models that show how often Big South opponents throw a fastball in certain situations and be able to predict if a hitter should "sell out" for a fastball. To perform this, I will use data from several Big South opponents from the 2024 season. Some of the variables that would be included in the data set are: pitch type, count, inning, batter number (1-9), score, team, opponent, and several others. The variables I will explore the most are count, inning, and batting order number to see how the fastball percentages change when these variables change. I will create several graphs that show percentages on how often certain pitches are thrown in given situations.

## Influence of Childhood Trauma in Developing and Maintaining Adult Relationships

**Damian McGregor-Wickam**
Carla Hall Alphonso, Ph.D.
Department of Sociology

An individual's capacity to establish and sustain adult relationships can be significantly and permanently impacted by childhood trauma. Emotional regulation, attachment styles, and interpersonal trust are shaped by early negative events like abuse, neglect, or dysfunction in the home. Unresolved childhood trauma may exacerbate communication, intimacy, and conflict resolution issues in adult relationships, according to research. Using attachment theory, trauma theory, and empirical research as a guide, this paper investigates the psychological and sociological processes by which childhood trauma influences adult relationship dynamics. This study emphasizes the value of trauma-informed practices and early intervention in promoting healthy adult relationships by recognizing these links.

## Predicting Orthologous Groups of Proteins/Domains With Graph Based Clustering Algorithm

*Poster Presentation*

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**Bethany Elaine McManus**
Marharyta Petukh, Ph.D.
Department of Biology

Comparative evaluation of amino acid sequences is a well-known method used for evolutionary analyses, functional annotation, phylogenetic reconstructions of proteins, and assistance in distinguishing between deleterious and benign mutations in proteins. This analysis relies heavily on detecting homologous proteins that share an evolutionary ancestry. Within the family of homologous proteins, one may distinguish orthologs and paralogs. While the function of orthologs is likely retained due to selective pressure, paralogs diverge faster and, as a result, might acquire new functions or become dysfunctional. We propose an automated pipeline that allows distinguishing "allowed" non-synonymous amino acid substitutions (benign mutations) from "non-allowed" substitutions (likely pathogenic mutations) in proteins by identifying orthologous sequences to the query protein sequence from a total set of homologs with graph-based clustering algorithm with a consequent residues conservation analysis within the orthologous group only. We hypothesize that by removing paralogs to the query sequence from the list of homologous sequences, we increase the prediction accuracy of the effect of single amino acid substitution on protein activity. Four codes were written to achieve this goal: 1) identifies homologous sequences through NCBI's BLAST Database using query sequence as the input; 2) performs Multiple Sequence Alignment (MSA) and assigns percent identity of homologous sequences to the query sequence; 3) performs cluster analysis to separate clusters of orthologous groups; 4) builds Maximum Likelihood phylogenetic tree of orthologous group/cluster containing query sequence. The performance of the proposed algorithm was tested on NPC1 protein proving its efficiency in distinguishing benign vs pathogenic mutations.

## Manufacturing Internship

*Poster Presentation*

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**Avery Ann Michowski**
Eli Thomas Owens, Ph.D.
Department of Physics

This highlights the manufacturing processes at Gentile Packaging Machinery in Michigan. The experience focused on operating manual and CNC machines in the production of parts for automated packaging machines. This internship provided hands-on experience in manufacturing techniques and industry-standard production.

## Helping the Community Garden

*Poster Presentation*

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**Ashley Ellen Miller**
Julie Meadows, Ph.D.
Department of Religion and Philosophy

This project highlights the importance of community and what things it may take to build that concept. Discovering the Community Garden was very exciting for me, and I felt drawn to the task of helping out. I volunteered right away and strived to help Dr. Brent and Dr. Moore push the garden to be where they would like it to be. It started as volunteering a few Saturdays, to organizing a day where my team and I went to help. We painted primer to prep the side wall for painting and cleaning the garden beds. The conclusion of my project landed on supporting the tasks completed and continuing my appearances in the garden.

## HBot: Mastering Coding and Cybersecurity Through Interactive Learning

**Max Nicklaus Monroe**
Olivia Mambo Nche, Ph.D.
Department of Computer Science

HBot is a project that uses AI-driven speech and video game mechanics to teach users about computer security, focusing on ransomware and Trojan horse attacks. The game guides players through a fun, interactive experience where they learn key security practices like updating software and spotting threats. It includes four main scenes: an introduction to basic security, a decision-making challenge about skipping software updates, a scenario with Trojan horse attacks, and a final scene to review what was learned. Built with Unity 3D, HBot makes learning about cybersecurity engaging and easy to understand. This project shows how AI and games can help users better understand complex security concepts while promoting safer computing habits in a fun and memorable way.

## From Capitol to Catch: How state politics and regulations are shaping the future of aquaculture and seafood

**Barrett Jennings Moody**
Justin Lance, Ph.D.
Department of Political Science

Today, the average American consumes around 20 lbs of seafood annually, though a ⅓ of the annual beef consumption, a notably high factor continuously growing as more agencies promote the health benefits and pricing of seafood over other protein sources. This shift to more coastal consumption economically is a missed opportunity for the U.S. as it currently imports over 90% of its seafood, half of that being produced by aquaculture. This study aims to isolate the impact of state policies on the expansion of the U.S. aquaculture industry. Social acceptance and technology are relevant and notable topics, however policy is regarded as the framework for incoming industries. This study enhances practical data on production in regard to policy, and inquires if state policies, including environmental regulations and management structures, significantly shape each region′s industry. By analyzing certain policies and their impact, my independent variable should yield exploratory results. Neutral in nature there is no assumption a certain policy is better than another but focused on what states have, don't have and how that correlates with production volume. By examining the intersection of policy, economics, and regional characteristics, a comprehensive overview of state-level political influence is formed.

## The Impact of Single-Parent Households and Parental Involvement on Child Well-Being: A Comparison with Two-Parent Families

**Jy Minnie Nunley**
Carla Hall Alphonso, Ph.D.
Department of Sociology

This study asks how growing up in a single-parent household, along with different levels of parental involvement, impacst a child's overall well-being compared to those raised in two-parent households. To answer this question, the study uses data from The Future of Families and Child Wellbeing Study and the Fragile Families Challenge. These datasets track about 5,000 children born in major U.S. cities between 1998 and 2000, with a focus on children born to unmarried parents. The data include important details about family structure, parental involvement, academic performance, mental health, and social behavior, making them useful for understanding these relationships. This study will use statistical methods such as multiple regression analysis and logistic regression, Additional analyses will look at how factors like income, education access, and community support might affect these relationships. The hypothesis is that children from single-parent households, especially those with lower parental involvement, will have lower academic achievement, higher rates of mental health struggles, and weaker social skills compared to children from two-parent households with strong parental involvement. The goal of this study is to provide useful insights for educators, policymakers, and social service organizations to help support children from different family backgrounds and improve their overall well-being.

## Within Our Lenses

*Poster Presentation*

**Tsogt-Ochir Otgonpurev**
Julie Meadows, Ph.D.
Department of Religion and Philosophy

In this contemporary society, our lives are closely interlinked with photos. After we are born, we are photographed by our parents, our face, features, the past recorded in a materialized object. When we are young, we capture what captivates our attention, whether it's a cool looking car, pics of our mom, our favorite toys, which can show what kind of a child we are, the bases of our personalities, and lives. Throughout time we grow up becoming more and more different from one other, specializing in our interests, expressing these differences through our photos. Images most often interact with individuals' existing understandings of the world to shape information processing and judgments (Domke. Et al. 2002) With the power of images and photos through this project, the student's life course, deep intuitions within themselves can be shared, or say interacted between. Creative placemaking builds on local human, physical, and cultural assets to enhance the social and civic fabric. It builds on distinctive local character and story. It is a long-term, partnership based strategy that results from a commitment to social equity and a meaningful life for its residents as well as an interesting experience for visitors and a stronger economic base for the area. With creative placemaking through photo exhibitions, communities can dig into who they are, where they belong, and the stories that bind them together. Photo exhibitions aren't just walls filled with pictures. They're like mirrors reflecting the messy, beautiful, human stories, family cookouts, the street festivals, the quiet moments on a front porch. When you line up snapshots of someone's grandma laughing, a kid's first bike ride, or the faded sign of a neighborhood diner, it stitches together this raw, unfiltered collage of what a place means. These photos don't just hang there—they scream, whisper, and nudge you to ask, "Hey, what's your story?"

## Lack of Action

**Ryan Nicholas Ouzts**
Stefan Wiecki, Ph.D.
Department of History

The Holocaust was one of the darkest times in history, not just because of what Nazi Germany did but also because so many other countries failed to step in and help. This research looks at why nations didn't act, arguing that they either didn't fully understand what was happening or they knew but chose not to intervene. By examining government records, news reports, and diplomatic messages, this study explores how much world leaders really knew and what factors influenced their decisions. Some of the key reasons include wartime priorities, immigration policies, antisemitism, and political concerns. Understanding these factors helps us learn from the past and think about how the world responds to similar crises today. This research sheds light on the dangers of ignoring injustice and the impact of global inaction.

## Sports Injury and Identity

**Michaela Masucol Paredes**
Philip D. Perdue, Ph.D.
Department of English

This research paper is an in-depth rhetorical analysis of how athletes utilize their mental and physical health as expressions of communication in the media, in order to shape their identities. The case study looks at three professional female athletes, Simone Biles, Naomi Osaka, and Suni Lee, and their public experience with mental and physical health. While there seems to be a lack of mental health awareness and women representation in the media, these specific cases tell stories that pave the way for athletes to feel safer and more supported throughout high-intensity competition and high-pressure social interaction. Mental health and physical injury can be defining frameworks of an athlete's identity especially with the rise of social media and the pre-existing expectations created by society. Utilizing a narrative criticism, framing, and identification theories, the study investigates the linguistic discourse of mental and physical health, created by these female athletes. The study will provide an understanding of how mental and physical health can act as a form of communication and begins to examine the avenue that exists for female athletes to speak out about their struggles.

## Utilization of Magnetically Induced Jamming in a Universal Gripper

**MacKenzie L. Partsch**
Eli Thomas Owens, Ph.D.
Department of Physics

There is a worldwide need for low cost, highly functional, upper limb prosthesis. Currently, an upper limb prosthesis can cost upwards of $30,000, and replacement is common for individuals such as athletes who put heavy usage on their prosthesis and children who quickly outgrow fitted limbs. The cost after all of these considerations can get extremely high, creating a large need for a more accessible and affordable option. To address this need, we created a high functioning, low cost, prosthetic gripper. We designed and built a gripper that utilizes a rigid three prong mechanism to grasp an object, analogous to an arcade claw machine. However, similar to the claw machine, the grippers' rigid edges alone will not be able to grasp all types of objects. This basic rigid gripper design was enhanced using granular pads attached to the end of each arm. The addition of these pads will allow the gripper to increase hold strength on the object being gripped. The pads used for our prototype consist of iron filings encapsulated by rubber membranes; the iron filings can be jammed and unjammed with the utilization of an external magnetic field. The operation of this gripper is as follows: when the object comes into the grasp of the gripper it will indent into the soft cushion of the unjammed pads, which will then be jammed into a rigid state via an external magnetic field produced by a semi-permenant magnet, and secures the object into the prosthesis' grasp. This design will allow for a strong and secure grasp on the object being gripped allowing for complete movements such as picking up and putting down objects of various sizes and shapes, as well as the ability to complete tasks such as turning open a doorknob. Through this project we will increase the accessibility of a low cost and accessible gripper with high functionality.

# El Tabú en "La Sociedad de la Nieve"

**Cecilia Pérez Santiago**
Sharon E. Knight, Ph.D.
Department of Modern Foreign Languages

Esta investigación examina la representación de los tabús y los derechos humanos en la cara de extrema adversidad en la película "La Sociedad de la Nieve," con un enfoque en la fe católica. La película narra la extraordinaria historia real del accidente aéreo que ocurrió en los Andes en 1972 y la lucha de los supervivientes por sobrevivir. Analizando el papel de los tabúes - específicamente los que rodean al canibalismo- la investigación explora cómo estos tabúes se redefinen o se mantienen cuando la supervivencia se convierte en la principal preocupación. El estudio explora críticamente la tensión entre los derechos humanos y los instintos de supervivencia, y cómo las creencias religiosas complican e informan las decisiones en situaciones de extremidad. A través de esta exploración, la investigación pretende iluminar la intersección complicada entre la fe, los derechos humanos y los tabús.

This research project examines the representation of taboos, human rights, and the Catholic faith in the film "Society of the Snow" (2023). The film relates the extraordinary true story of the plane crash that occurred in the Andes in 1972 and the struggle of the survivors in its aftermath. "Society of the Snow" is a narrative about human resilience and moral dilemmas in life and death situations. Analyzing the role of taboos, specifically those surrounding cannibalism, this research explores how these taboos are redefined or maintained when survival becomes the primary concern. This study critically explores the tension between human rights and survival instincts, and how religious beliefs complicate and inform decisions in situations of extreme distress. Through this exploration, this research treats the complicated intersection between faith, human rights, and taboos.

IGNITE: The Art of Ceramics
*Harper Gallery*

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**Cecilia Pérez Santiago**
Ralph H. Páquin, MFA
Department of Visual and Performing Arts

This exhibition showcases the work Cecilia Perez who has spent the last few semesters learning the art of ceramics. The pieces reflect skills she has developed over the years, drawing inspiration from her cultural heritage and the world around her. Each artwork portrays the blending of tradition with personal experience in the arts. Cecilia will be available in the gallery to answer any questions about the exhibit and her vision as a developing ceramicist. She will also have a powerpoint that will show other ceramic works and descriptors of her artistic process.

## Factors that Influence Violent Crime

*Poster Presentation*

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**Jonah Pierce**
Carla Hall Alphonso, Ph.D.
Department of Sociology

There are many different socioeconomic factors that influence violent crimes. This study focuses on the connection between unemployment, income levels, and highest education completed with violent crime rates. Also, it shows how socioeconomic problems and crime rates are related through these factors. Income inequality can cause an increase in crime as well as low unemployment because they are financial struggles which leads to people committing violent crimes. Higher crime rates and fewer employment opportunities are also related to lower levels of education. Policymakers and police departments need to recognize these connections in order to develop effective crime prevention plans. The purpose of this research is to empirically understand how economic and educational inequalities affect violent crime and offer alternative solutions to help prevent violent crime.

# Exploring α-ketothioesters as a Carbon Monoxide Donor for Therapeutic Applications

**Kayla Rose Ponchamni**
Kimberly De La Cruz, Ph.D.
Department of Chemistry and Biochemistry

Over the past few decades, CO has been studied as an alternative therapy to traditional cancer treatments with several recent clinical trials administering CO through inhalation. Despite promising results, a significant obstacle facing this therapy is the precise measurement of dosage, as there is a clear risk for excessive inhalation of CO. Thus the concept of "CO-in-a-pill" emerged, wherein small organic molecules with well-defined CO-release chemistry and kinetics are being used as surrogates to CO gas inhalation. While well-known decarbonylation chemistries have been extensively studied to this end, new chemical strategies need to be developed to address critical limitations of current CO donors. Based on the molecular logic of an unprecedented chain editing reaction of $\alpha$-keto thioesters in the ketosynthase domain of a protein in the assembly line of barbamide, a novel chemical scaffold was designed and synthesized to release CO by imposing cyclization constraints that will lead to a decarbonylation reaction. Various synthetic strategies such as EDC-based and oxalyl chloride-based coupling strategies were explored to install ketothioester and ketoester functionality on ortho-positioned nucleophilic groups. While all of the reactions were conducted under inert gas atmosphere, the instability of some of the substrates such as 1,2-benzenedithiol caused conversion and purification issues. Preliminary analysis of crude products using CO-sensing fluorescent probe revealed that ketoesters did not lead to a decarbonylation reaction. Other synthetic strategies such as Mitsunobu thioesterification and other coupling reagents will be explored in the future. These initial synthetic studies are important in building lead compounds that can be modified for biological applications, eventually paving the way for advancements in drug delivery systems for CO-release in therapeutic applications.

## Gun Violence in America

**Robert James Porter II**
Carla Hall Alphonso, Ph.D.
Department of Sociology

This project explores gun violence and its impact on America and all 50 states. For years guns have had a huge impact on society and have affected people in many different ways for example school shootings, gang shootings, mass shootings, and accidental shootings. This presentation will cover the statistics in the number of shootings that have happened throughout the 50 states; spending per capita on mental health since 2009, and state firearm death rates since 2009. I will also cover how mental health issues are some of the root causes of some of these shootings and the number of years that have cases involving mental health in these shootings. Lastly, I will discuss potential solutions and preventive measures that will be focusing on policy changes, mental health support, and community efforts to reduce gun violence shootings. With this presentation I aim to better understand the root of gun violence and explore actionable steps to create a safer future for all Americans.

## Faith, Politics, and Polarization: Understanding Catholic Voting Patterns in Post-Roe America

**Dakota Ray Price**
Justin Lance, Ph.D.
Department of Political Science

This research explores the political division among Catholics in the United States, emphasizing the increasing polarization and near-even split along party lines. Current polls show a 48% Republican identification and 47% Democratic identification. This research aims to find a key link between parishioners views on abortion and their political party identification. Using quantitative analysis of the Pew Religious Landscape Study and existing literature, the study investigates how views on abortion shape political alignment among U.S. Catholics. By controlling for demographic factors such as race, gender, and age, the research provides a deeper understanding of Catholic voting patterns in post-Roe America.

## Combatting Loneliness and Fostering Connection Among Today's College Students

**Caroline Grace Rairigh**
Drew Brandel, Ph.D.
Department of Psychology

Among today's college students, loneliness is negatively correlated with persistence in continuation of college, academic achievement, and overall mental health (Gopalan & Brady, 2019). Further, loneliness in this population is exacerbated by the constant influence of social media, which has contributed to higher levels of loneliness and depression under experimental conditions (Hunt et al., 2018). In Fall 2024, we examined loneliness, social belonging, and social media habits as they exist on the campus of Presbyterian College, as well as the feasibility and utility of simple, self-led reflections as an intervention to loneliness. Using the UCLA Loneliness Scale, the Social Belonging Survey, and a researcher-created social media questionnaire, baseline data were collected at Weeks 1-2 (Russell, 1996; Walton & Cohen, 2007). The preliminary results matched that of the previous literature on loneliness among Gen Z college students. For Weeks 3-5, participants completed weekly exercises in which they reflected on their most meaningful relationship, a group to which they have strong belonging, and their social media habits. Finally, participants completed the initial assessments again as well as a researcher-created utility and feasibility survey regarding the self-reflection intervention. Results suggested possible refinements for future interventions, such as implementing a behavioral component.

## Low-level carbon monoxide gas enhances antibiotic effects

**Yasmeen Maher Rasasi**
Stuart Gordon, Ph.D.
Department of Biology

Antimicrobial resistance presents a growing challenge in treating bacterial infections, necessitating alternative strategies to enhance antibiotic efficacy. Studies have shown that carbon monoxide (CO) releasing molecules (CORMs) can disrupt bacterial cell metabolism making bacteria more susceptible to the action of antibiotics. However, since CORMs are also heavy metal-containing compounds, separation of the effects of CO gas from its heavy metal core is challenging. Although high concentrations of CO have proven antimicrobial effects, studies on the effects of low-level, physiologically relevant concentrations of CO in combination with an antibiotic are still limited. This study investigated the use of safe, lower, and controlled concentrations of CO to enhance the action of antibiotics, without causing toxicity/adverse effects to host cells. CO gas at 50 and 100 ppm were administered with various antibiotics - novobiocin 30 µg and 5 µg (NB30 and NB5), oxacillin 1 µg (OX1), neomycin 30 µg (N30), vancomycin 30 µg and 5 µg (VA30 and VA5) against Gram-positive (S. aureus) and Gram-negative (E. coli) bacteria using the Kirby-Bauer disk diffusion method. Bacterial strains were cultured on LB agar plates, and antibiotics were applied using an antibiotic disk dispenser. To ensure controlled exposure, a CO chamber was constructed by generating CO gas through the reaction of sodium hydroxide and oxalyl chloride. In E. coli, results indicated that CO gas at 50 and 100 ppm increased the zone of inhibition of NB30, demonstrating a statistically significant increase in bacterial inhibition compared to antibiotic treatment alone. This result was not observed in S. aureus. However, co-treatment of VA5 with CO (50 ppm) led to a statistically significant increase in bacterial inhibition. These findings suggest that CO gas may serve as a potential adjuvant to conventional antibiotics, offering a novel approach to combat antimicrobial resistance.

## Creative Writing: Senior Portfolio

**Kaila Michelle Reid**
Robert E. Stutts, MFA
Department of English

Students in Creative Writing: Senior Portfolio revise previously written pieces for a professional portfolio.

## Influence of American Eugenics on the German Nazi Movement

**Anna Nance Reynolds**
Stefan Wiecki, Ph.D.
Department of History

Starting in 1921, Hitler rose to power within the Nazi party and promoted many racist ideologies against anyone who did not portray the ideal German image. This was the start of the Holocaust in Germany where 6 million Jews and other groups were murdered by the Nazis. However, this was not the first time the idea of creating a pure race surfaced. Eugenics was a popular topic prior to WWII in the United Kingdom and France but especially in the United States of America. Many American Eugenicists, like Madison Grant, believed that the human race could be improved through selective breeding by sterilizing anyone with genetic defects that were thought to be hereditary. Many American racial laws existed that relate to the German Nuremberg laws made in 1935. Ultimately, the Nazi movement, led by Hitler, had certain beliefs and tactics that American Eugenics may have inspired.

## DNA Analysis of Harperella

**Hanna Grace Rikabi**
Michael O. Rischbieter, Ph.D.
Department of Biology

Harperella nodosa (Ptilimnium nodosum) is a rare, endemic plant found in South Carolina's Carolina Bays, unique pond environments located in the midlands and lowcountry. Its capacity to colonize these uncommon habitats, such as the restored Janet Harrison High Pond Preserve (JHHPP) in Monetta, SC, has been a focal point of research, particularly as many bays have been converted for agriculture. Population sizes at JHHPP fluctuate significantly, ranging from over 10,000 to as few as 10 individuals, influenced by variable environmental factors. This study aimed to assess genomic variability among three distinct H. nodosa subpopulations at JHHPP. DNA was extracted from these subpopulations and from related Apiaceae species—Petroselinum crispum, Daucus carota, and Lilaeopsis brasiliensis. To enhance phylogenetic resolution, both a universal primer targeting the ITS2 (Internal Transcribed Spacer 2) region of nuclear ribosomal DNA and species-specific primers were developed and tested. Seventeen DNA samples were amplified with both primer types, generating 34 sequences for comparative analysis. The findings provide insights into the genetic structure of H. nodosa and the efficacy of primer sets for phylogenetic reconstruction. This research contributes to understanding genetic diversity within endangered plant populations and supports strategies for restoration and conservation in habitats affected by anthropogenic and natural disturbances.

## Physiological Mechanisms of Rapid Color Change in Cephalopods

*Poster Presentation*

**Kinsley Carole Roark**
Jim Wetzel, Ph.D.
Department of Biology

Octopuses, squids, and cuttlefish are examples of cephalopods that have a sophisticated and dynamic color-changing system that helps them communicate, conceal, and evade predators. The physiological mechanism needed to produce pigmentation, control iridescence, and regulate brightness depends on the interactions of chromatophores, iridophores, and leucophores. High-resolution microscopy and proteomic studies show that Reflectin and Ω-crystallin are two important structural proteins that control these quick adjustments. While Ω-crystallin stabilizes pigment granules during chromatophore expansion and contraction, Reflectin proteins use thin-film interference to produce iridescent, angle-dependent color variations. Together, these components enable cephalopods to undergo quick yet steady color changes, which enables them to react to environmental cues efficiently. The integration of pigmentary and structural elements in cephalopod coloration is highlighted in this work, underlining its vital function in social signaling and survival.

## Evaluating bacterial resistant surfaces modeled after shark-skin morphology: A study of biomimicry

**Mattison Elizabeth Rumfelt**
Jim Wetzel, Ph.D.
Department of Biology

Maintaining sterile and clean healthcare environments is crucial in sustaining wellbeing an preventing infections. Schools, public transport, restrooms, tourist attractions, hospitals, and doctor's offices are all known to harbor colonies of pathogenic bacteria. Bacterial formations on surfaces in any health care setting may increase the risk of a variety of infections in patients and employees. With the population occupying those environments being already vulnerable, maintaining a clean, sterile surface is essential. In nature, a shark's dermal denticle skin pattern is known to reduce frictional drag of the shark's body while swimming. However, this raised surface pattern of the skin is also theorized to inhibit bacterial colonization – without which, marine biofilms are not deposited. Marine biofilms are required for planktonic organisms such as Barnacle larva to settle and complete metamorphosis. Accordingly, this pattern applied to boat hulls could reduce marine fouling and eliminate the need for periodic hull cleaning, or the use of toxic lead-based hull paints that are currently applied to reduce colonization. To potentially decrease bacterial growth on surfaces, Sharklet Technology has constructed a synthetic material which mimics the raised pattern of shark dermal denticles. My study used correlative microscopy (scanning electron microscopy and photomicrography) to measurebacterial growth on a smooth vs shark-like rough surface pattern.

## Changes in Individual Attitudes Toward Immigration within the Republican Party

**Sophie Grace Small**
Justin Lance, Ph.D.
Department of Political Science

Immigration has become arguably one of the most divisive political topics. Attitudes towards immigration in both parties have evolved over time, but the Republican Party has had the most significant changes in their stance on immigration. Republican attitudes are becoming increasingly more negative and restrictive. But what has been the cause of their change in attitude? This study aims to determine just how individual attitudes towards immigration have changed within the Republican Party and what the cause(s) of these changes are.

## Women in Leadership in the Presbyterian Church (USA)

**Sarah Grace Stanley**
Bob Bryant, Ph.D.
Department of Religion and Philosophy

Since the founding of Christianity, there has been an on going debate on the place of women within the Church. More notably, there has been a debate on whether women are fit for positions of leadership. Both sides of this debate have used Biblical texts to either support or deny the claim that women are fit for positions of power. Some of the most important texts are the early writings in Genesis and the writings and letters of Paul. These texts have been used both with and without context and their meanings have been thought to have changed many times. Throughout this paper and presentation, the way that these texts have been used and their true arguments will be analyzed. Furthermore, a brief history of places of women in the Church will be discussed. Finally, the paper will look at how the Presbyterian Church (USA) have come to ordain and support women in ministry, and how and why other denominations have not.

## Breaking Down the Blitz: Statistical Insights from a Collegiate Football Defense

**Zebulon John Stroup**
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

Blitzing is a high-risk, high-reward defensive strategy in football that aims to pressure the quarterback by sending extra pass rushers. This study examines the effectiveness of blitzing using play-by-play data from a complete defensive season. The analysis evaluates how blitzing impacts key defensive outcomes, including sack rates, down win/loss rate, forced incompletions, turnovers, and opponent yardage gains. By comparing blitzed plays to non-blitzed plays across different down-and-distance situations, coverage schemes, and field positions, this study seeks to identify patterns in blitz success. Additionally, the study investigates whether certain blitz calls are more effective than others and how opposing offenses adjust to defensive pressure. The findings aim to provide actionable insights into optimal blitzing strategies, helping defensive coordinators make data-driven decisions to maximize defensive efficiency.

## Implementing Mental Health Resources within the PCUSA

**Riley Elizabeth Taylor**
Craig Vondergeest, Ph.D.
Department of Religion and Philosophy

Mental health awareness has increased magnificently in the last five years. Thankfully, different denominations of faith have also focused on this epidemic that we face, including the Presbyterian Church (USA). This paper explores the mental health resources available within the denomination, examining initiatives, policies, and pastoral care programs that support individuals facing mental health challenges. The PCUSA has already made significant progress in addressing these issues, with different types of ministries and resources made to help with the stigma surrounding mental health. Specifically, this study will observe the combination of both mental health professionals and church leaders to better the programs and awareness of mental health in the church. These resources reveal the importance of faith communities in the support of mental health.

# Evaluating the Physiological Benefits of Swimming

**Christopher Layne Tennyson**
Jim Wetzel, Ph.D.
Department of Biology

Swimming is a favored recreational activity for many and has, in recent years, gained traction as a popular means of improving one's health. Swimming requires muscle strength, endurance, and coordination and has proven beneficial to overall health and well-being. It is a complex mode of cardiovascular training that employs strength, reflexes, coordination, and cardiovascular ability. When compared to a sedentary lifestyle, it is known that swimming can significantly reduce the risk for cardiovascular diseases like myocardial infarction and ischemia. Moreover, swimming does not accompany the joint stress that is associated with other cardiovascular exercises such as running or cycling. Because of this, swimming is favored by many elderly people or those with arthritic conditions. However, individuals of any socio-economic or health background can reap the physical benefits of swimming. Additionally, swimming differs from other modes of cardiovascular exercise in body orientation, muscle groups used, breathing pattern, and the medium in which it is performed. All these factors provided a good model for the study of the physiological benefits gained through swimming. My research was designed to measure several parameters of fitness over an 8-week period of swimming. Using the Biopac Physiology system, the initial through week 8 of the following were measured: Heart rate, ECG, blood pressure, electromyography, and respiratory capacity. Using data collected on day 1 of the experimental period, a baseline level of fitness was established for each of the individuals in the study using this set of parameters. This established my hypothesis that there should be a marked, measurable, and progressive improvement in these parameters after two, four, six, and eight weeks of swim training.

## Artificial Insemination and Embryo Transfer in Bovine

*Poster Presentation*

**Eric Rodrekas Terry**
Jim Wetzel, Ph.D.
Department of Biology

Over the years the agricultural practice of allowing cattle to breed naturally has been on an annual decrease. Since 2020 the cattle reproduction by natural means has decreased 40%. This has benefited the farmers who raise cattle and had a positive effect on the agricultural environment. By using embryo transfer methods and artificial insemination procedures, the US has been able to stabilize the decline in beef production. Embryo transfers have improved the genetics of the farmers herd, which not only helps the farmers but benefits the population of beef consumers. The artificial insemination procedure is very important because it allows selection of sperm from the bull carrying the desired traits. A bull that is chosen by the farmer is a superior bull that would increase the genetic fitness of his entire herd. Furthermore, collecting sperm from the bull is much cheaper than having a present bull in the pasture. Although there are benefits with these procedures. There are also problems that can occur with embryo transfers and artificial insemination. These factors include of the physical size of the bull; whether the heifer support the calf, and whether her body remove the cysts that are formed on her uterine horns. Collectively these procedures will continue to play a prominent role in the cattle production industry, and potentially stop the decrease or the plateau that is currently occurring in commercial beef production. Accordingly, artificial insemination and embryo transfers give American farmers hope of an increase in profits in a globally competitive market.

## The Effects of Child Abuse and Neglect

*Poster Presentation*

**Alejandro J. Tovar**
Carla Hall Alphonso, Ph.D.
Department of Sociology

Child abuse and neglect are issues that affect countless children worldwide, yet they often do not receive the attention they deserve. These problems take many forms such as physical, emotional, sexual, or even neglecting a child's basic needs or medical care all of which can leave lasting scars. When left unaddressed, the effects of abuse and neglect can extend far beyond childhood, creating a ripple effect of trauma that impacts future generations. With this capstone project I aim to shed light on the critical issue of child abuse and neglect by exploring its presence in the school system, the importance of recognizing and addressing it, the various forms it can take, and practical strategies for prevention. By understanding the scope and impact of this issue, we can work toward creating a safer and more supportive environment for all children. While doing this study I will be using data that I have obtained from National Data Archive on Child Abuse and Neglect. The data provides longitudinal data collected from five different research sites with a goal of following over 1,300 children and their families from early childhood until the child enters young adulthood and it is all taken by child protective services.

## Social Mobility within Youth Sports Targeting Lower Income Communities

**Dillon Carl Towles-Kendle**
Carla Hall Alphonso, Ph.D.
Department of Sociology

This project explores the relationship between participation in youth sports programs and social mobility in low-income communities. While there are multiple ways to achieve social mobility, involvement in organized youth sports can play a vital role for achieving higher mobility by maintaining social networks, seeking quality education, and obtaining necessary life skills. Youth who participate in organized sports are more likely to experience upward social mobility compared to their peers who do not participate. To test this hypothesis, there are many methods to be used to obtain all my data to make my hypothesis valid, but also finding any qualitative and quantitative data to support my hypothesis. In conclusion, by doing this research, it can help me get a better understanding of how youth sports can play a vital role in shaping social mobility and a sense of social equity within low income communities.

## Extraction of Metals Using Deep Eutectic Solvents

**Alan Lowell Turner**
Craig Powell, Ph.D.
Department of Chemistry and Biochemistry

Metals on our planet are a nonrenewable resource. Thus, we will eventually run out unless an efficient way to recycle or reuse metals can be created. Currently, the most time efficient method in our capacity is pyrometallurgy. However, this method comes at great cost to our environment as it produces large volumes of toxic fumes and waste like slag. Deep eutectic solvents (DES) have become a much more environmentally friendly alternate way of extracting metals. Not only are DESs greener but they have the potential to extract more metals from industrial waste; notable lithium-ion batteries which are infamously difficult to recycle. In this study, a method of synthesis of the solvent was used and the extraction of cobalt from cobalt (II) oxide was attempted. The end goal of this study was to set up a process for future studies to follow.

## Biomechanics of Foot Posture: Impact of Foot Posture on Axial Alignment

*Poster Presentation*

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**Rhogue Hart Wallace**
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Department of Biology

Posture of the feet or ankles is suspected to affect the overall posture of the body. Accordingly, the biomechanics in foot posture could alter the axial alignment. The ankle joint is the stabilizing factor for the body, connecting the forces of the body with the forces of the ground and gravity. Weight bearing delivers stress on the bones, muscles, and ligaments. Analyzing the biomechanics of the tarsals will provide a better understanding of the stresses that are exerted upon the joint and muscles. Gait and posture performances affect the position of the lower extremities. Poor foot posture and biomechanical imbalances can cause uneven alignment of the hips, reduce postural stability, and lead to pain or discomfort in the lower extremities. Determining foot posture and function is measured during both static and dynamic exercises by analyzing the custom software (MATLAB) results (Cobb et al., 2014) calculating Arch Index and Centre Pressure Excursion Index. Postural stability is calculated using a motion analysis system (Khamis et al., 2015) to evaluate hyper-pronation and its effects on pelvic alignment. Lower back pain is evaluated using Framingham foot study (Menz et al., 2013). There is no significant effect on anteroposterior stability from foot positioning and ankle strength, though, high arch posture and strong ankle-inversion muscles create instability. Hyper-pronation of the foot impacts the rotational alignment of lower extremities in a segmental chain up to the pelvis. Women with pronated foot function while walking experience significant relation with lower back pain.

# The BET bromodomain inhibitor JQ1 differentially induces cell death by suppressing the adaptive hypoxic response in triple negative breast cancer cells

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Triple-negative breast cancer (TNBC) cells are enriched with unique characteristics that contribute to their chemoresistance and metastatic potential. One notable characteristic is their ability to adapt to hypoxia, which shapes the aggressiveness of TNBCs. However, the ability to inhibit molecular priming that allows TNBC cells to adapt well to hypoxia is not well understood. To provide further insight concerning TNBC and its intrinsic metastatic mechanisms, we used the BET bromodomain inhibitor JQ1 to determine its effect when TNBC cells are challenged with the hypoxia chemical mimetic cobalt chloride ($CoCl_2$). From our results using both a rezuarin-based (e.g. Presto Blue) assay and crystal violet staining, we determined that JQ1 was able to differentially increase cytotoxicity in our TNBC cell line SUM159PT when treated with sublethal doses of $CoCl_2$. Morphological comparison of SUM159PT cells using LADD staining with our different treatments of $CoCl_2$ and JQ1 showed that while single JQ1 and $CoCl_2$ treatments were morphologically flatter from our control cells, dual JQ1/$CoCl_2$ treated cells were were undergoing intracellular cell stress induction. Based on these phenotypic results, we performed RNAseq differential expression analysis on our different $CoCl_2$/JQ1 treated SUM159PT cells and determined a specific hypoxia gene expression signature induced by $CoCl_2$ that was able to be repressed by JQ1. From our results, we demonstrate a preclinical model where BET bromodomain inhibition can induce intracellular cell death by suppressing an adequate response to hypoxia in TNBC cells.

## Autism: Abstract Conceptions and Influences on Literacy

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In personal belief the Autism Spectrum encompasses a unique and broad array of diagnoses, with variations in severity, strengths, and challenges. Individuals with Autism have weaker reasoning abilities in comparison to individuals with standard development and reasoning abilities. When working with children with Autism, the overall general goal is to help them improve their function and skills to be as independent as possible. The abstract concept of Autism and the influence it has on comprehension, literacy, and reading within elementary aged students has increased within the state of South Carolina. However, there is insufficient research on how to help students with ASD improve in their overall literacy skills. The mission of this research is to bring to light different approaches to increase literacy rates among students with ASD in the state of South Carolina, while mainly focusing on Title 1 schools. The method to approach this topic is to conduct a series of mixed method approaches through qualitative and quantitative data.

## Effects of Financial Metrics on Predicting Profit Margins

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This capstone examines the relationship between financial metrics and financial stability, with a particular focus on profit margin predictability. Using financial data from Fortune 500 companies, the research explores whether financial metrics, such as net profit margin, debt-to-equity ratio, and total asset turnover, can effectively forecast profitability. Descriptive and correlation analyses will be applied to categorize companies based on profit margins and sector classifications to identify industry-specific trends. Additionally, Tableau visualizations will be utilized to illustrate financial patterns, and regression modeling will assess the predictive power of key financial ratios. By identifying the most reliable financial indicators of profitability, this research aims to provide valuable insights for investors, analysts, and corporate decision-makers. The findings will contribute to improved risk management strategies and a deeper understanding of financial sustainability using these predictors.

## Effects of Racial Diversification on Community Safety

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Racial diversity in the United States has always been a relevant topic of discussion as the country has such a unique variety of different cultures. This study explores the effects of racial diversity on community safety, and this is a significant topic in this age due to the brewing racial tensions in the United States. The study has analyzed data obtained from the UCR program detailing crime rates and U.S. Census data that will focus on demographic information. The multi-faceted relationship between crime, race, and socioeconomic status will be reviewed in depth to create a deeper understanding of how racial diversity in communities produces a positive effect on community safety. Within this study, the aspects of economic inequality are evaluated in relation to race and crime rates. Racial diversification in neighborhoods can aid in reducing community crime rates and promote community safety. The community must work together to respect others' cultural beliefs and be willing to separate themselves from any racial bias or negative perceptions of other ethnic groups to foster a sense of security and peace among their fellow residents.


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