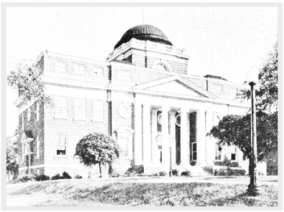
Honors Day Symposium

PRESENTER ABSTRACTS



Presbyterian College

April 20, 2023

April 20, 2023

To All the 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 comes in the form of presentations, poster sessions, and performances. These culminating experiences demonstrate the impressive academic work that 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 program. Congratulations to all the students whose work is being highlighted today!

Students from all departments and programs on campus participate in research opportunities, available during both semesters and in the summer. Since a capstone is required for all majors, PC students are able to explore scholarship in their chosen field. Collaborative student-faculty research is at the heart of PC Summer Fellows program, and some students carry out honors projects as part of their major. 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 2023 Honors Day Symposium!

Sincerely yours,

Kerry E. Pannell, Ph.D.
Provost

April 20, 2023

Dear PC Community,

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

PC is certainly known for its academic rigor, but many students soar above and beyond classroom expectations, even despite the numerous hurdles the faced during another challenging year. Involvement in this year's 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've pursued their passions and satisfied their curiousity in the disciplines of the liberal arts. They've gotten up early and stayed up late, all in an effort to present the work you'll see. We couldn't be prouder of them.

Please join me in congratulating the students presenting during Honors Day. Congratulations, also, to the students receiving awards today and to the faculty who have mentored these diligent student researchers, writers, and artists.

Welcome to Honors Day!

Respectfully,

Matthew vandenBerg, Ed.D.

Artist Statement

Matthew Duncan

I've always had a fascination with digital art. Starting with 2016, I would create pixel art during my class time in high school, and I continue doing pixel art up to this day. Although pixel art isn't an aspect of this show, I mention it as that led me toward other digital media outlets such as photo manipulations. Photo manipulation is a major aspect of my art life today, where I collage images from different sources to create a completely unique scenario, different from that of the intended images. While digital art is my primary medium, I still create works such as paintings and sculptures, which reflect an approach similar to the concept of surrealism. I find creating realistic works like landscapes and portraits too boring for my tastes, and, while I still have a little more fondness or more abstract works over realism, they don't strike me much as they don't seem to have much meaning. Surrealism is the mix of abstract realism that has meaning, which is what I like about art.

My aim when creating these works is to give each a sense of mystery and wonder, while still having an element of symbolism or some sort of association or meaning. I want the viewer when they're looking at my pieces to feel curious about what's going on. After they take it all in, they can wonder about what it means, either finding deep conceptual messages

or other metaphorical aspects depending on the work presented. I prefer creating these surrealist "puzzle" pieces over making pictures of things in a more straight forward manner, such as a landscape painting or a portrait. Most of my digital images sources come through using stock photos, or "free for use" photos found on certain websites like "Pexels" or "Unsplash." I sometimes use my camera to get photos I can use, but there's only so much I can access to by pictures myself. Although the process can be limiting, I can make do with what I have through the photo manipulation techniques I have acquired over my time as a digital artist.

The contemporary art of today often features the abstract, surreal, and impressionist approaches. I would not say I am following a particular trend, but more that I happen to enjoy a style that's surging within the worldwide artistic community.

Artist Statement

Taylor Cunningham

The shortage of black subject matter illustrated throughout art history has inspired me to represent black stories and experiences in my work through a series of portraiture and narrative paintings. Black figurative artists like Kehinde Wiley, Jacob Lawrence, Amy Sherald, and Betye Saar influence me to center black subjects and culture in my paintings. I mainly work in oil and acrylic, incorporating various mixed media materials like fabric, paper, and cardboard. My paintings combine expressive and realistic art forms to analyze the relationship between the human condition and expression, and evoke an emotional reaction from the viewer. Color plays an integral role in my paintings, as I use it to provide symbolism, establish a mood within the subjects and the environments in which they are placed, and advance the viewer's eye.

Like that of many other contemporary African American portrait artists, I seek to represent the history of issues like race, gender, and politics in a modern context and highlight how the evolution of these themes has impacted conventional ways of thinking related to the cultural identity of the black community today.. These themes evolve and impact conventional ways of thinking about cultural identity in the current black community. My recent work displays how traditional beauty standards negatively affect

society's perception of black hair while combating harmful stereotypes. The paintings highlight the cultural significance and intricacies that make black hair beautiful. This portrait series uses the subject's gaze as a realm of importance to include the complexities of the physical form and the hair. Inspired by scenes from my personal life and commonalities within the black experience, my paintings offer onlookers an intimate view into the mind and soul of the rendered subjects. I strive to continue to create artwork that brings awareness to issues surrounding black identity, including the various factors that impact the development of one's psychological and social well-being.

I hope to highlight the adversities black men and women face due to misinformation while also illustrating the diversity of the black identity and celebrating the various aspects of black culture. My work intends to spark conversations about race and identity and encourage viewers to reflect on any internalized biases or misconceptions they hold towards people and ideas that differ from theirs.

Artist Statement

Cydni Lewmaya Miller

I am an artist that enjoys painting the human figure in an expressive and impressionistic way. Growing up, I've been something of a romantic when it comes to films, books and TV shows. From the noble sensibilities of chivalry in stories and fantasies, to the friendship dynamic in the hit TV show *Friends* by David Crane and Marta Kauffman, to the "love can defeat all" motif taking form in animes like Sword Art Online, I come to admire and strive to embody that outlook and and mentality. As a result, my art is a representation of the various feelings, some positive, some negative, and others somewhere in between or unseen, that surface when experiencing life with this type of "romantic" mindset.

Over my college career, I have developed a fond appreciation for Vincent van Gogh not only as an artist, but as a person. He was a man who felt strongly and saw a lot, but wasn't really recognized and understood until he was gone. The letters he wrote to his brother, Theo, touch me in many different ways and his work has inspired me to pour myself into making art. I have, like Vincent, set out to create visual stories exploring avenues of significant experiences with profound emotional consequences, again, some positive, negative, and many filling the space in between.

I know, more or less, what this means to me, how the pictures make me feel, but I am curious as to what they provoke and evoke in others. As with most art, these images will mean different things to different viewers. Please feel free to communicate your thoughts in reaction to the work.

Thank you and enjoy the show!

Student Observations and Analysis of Medication Errors in Community Pharmacy Settings

Martine Abouchabki
Mary Douglass Smith, Pharm.D.
Pharmacy School

The primary objective of this study is to describe student-reported medication errors in the community pharmacy setting, and secondarily determine plausible strategies to improve medication errors. Currently, pharmacists are not required to report medication errors in community pharmacies in South Carolina, unless stated in company policy. By bringing light to common medication errors, pharmacists may be more willing to report errors in hopes of identifying reasons for their occurrence and ways to avoid them. Over the course of 12 weeks, all P1 students enrolled in the Introductory Pharmacy Practice Experiential (IPPE) course at Presbyterian College School of Pharmacy evaluated at least 40 prescriptions at their assigned practice sites for any medication errors. Students used a standardized form to report any errors found. The medication errors were then analyzed to determine their potential level of patient harm. The methods of this study were adapted from a similar Purdue University's article, "Student observations of medication error reporting practices in community pharmacy settings." Any errors found were de-identified of specific community pharmacy practice site information.

This study frames a new mindset of the voluntary reporting of medication errors in community pharmacy practice. The term "mistake" or "error" is often followed with a bad connotation and never used as a learning tool. With this stereotypical mindset, humans find it easier to hide a mistake and not bring light to the situation due to the feeling of shame or guilt. Without courage to bring forth a new improved mindset of reporting mistakes, humans will never evolve. Pharmacists seek perfection in their daily work to ensure patients are not exposed to harm, however, human error is inevitable. It is crucial to the field, as new pharmacists emerge daily, that error is not condoned as punishment. By promoting an anonymous system,

a pharmacy culture can be developed to promote patient safety, accountability within the workplace, and provide guidance in prevention of medication errors within pharmacy practice.

Sustainability and Survivability: Are Local Newspapers in South Carolina Endangered?

Lauren Elisabeth Andrews
Kendra Yvette Hamilton, Ph.D.
Department of English

Local newspapers across the world are continuing to face an ongoing crisis—a revenue crisis. The traditional business model was centered around advertising revenue, with local businesses turning to their community newspapers to advertise their goods and services. With the rise of new developments, including the internet and Amazon, local newspapers, and small communities as a whole, are suffering. The internet offers cheaper advertising opportunities to local businesses, completely derailing local newspapers' traditional business model by taking away their advertising revenue. Many residents don't understand what they lose when their local newspaper disappears—their sense of a close community, protection from local government corruption, as well as factual, relevant news—and falsely believe that the corporate chains who buy their local newspapers will uphold the journalistic mission, a commitment to offering local communities information and protection. When local newspapers disappear, small, underserved communities are left in the dark and vulnerable. These concerns do not go unnoticed: the (Charleston) *Post and Courier*, aware of the severity of this crisis, funded the Oasis Project, a summer research initiative that was also funded by the Presbyterian College Summer Fellows program and the Russell Fund for Media and Society. Survey research and interviews conducted by our team with news leaders from across South Carolina allowed a closeup view of a national issue from the perspective of a group committed to the business even in times of financial, and emotional, turmoil. With their seasoned perspectives, as well as an in-depth literature review, a plan for survivability and sustainability became more clear, with the steps consisting of finding new streams of revenue, producing unique news for their communities, and implementing cross-platform publication. This proposal could serve as the foundation for a prosperous future for local newspapers in a new age of news consumption.

Optimization of Sputter Deposition System to Promote Sn Whisker Propagation

James Wilson Armstrong
Eli Thomas Owens, Ph.D.
Department of Physics

With constant technological advancements, the need to mitigate Sn whisker growth has become imperative. With guidelines prohibiting the usage of Pb in electronic components, the threat of device failure due to spontaneous Sn whisker propagation is significantly increased. Previous work on this project saw the development of a manipulable sputter deposition system capable of producing plasma at pressures necessary to induce intrinsic stress within thin Sn films essential for Whisker propagation. With these adjustments, it is necessary to continue the characterization of the sputter coater and continue device optimization. Adjustments have been made to the existing system to compensate for the stress provided by the increased voltage, and a method of maintaining plasma at low pressures is being developed. Through the continuous improvement of our methods and our system, controlled Sn whisker propagation is within reach. The study of these whiskers under varying background Ar pressure will give insight into how to mitigate spontaneous whisker propagation in an attempt to limit whisker-related device failure.

Is Football Heading in a Safer Direction for Players and Their Safety?

Jalen Rashaad Banks
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

American Football has quickly become the most popular sport in America and one of the most popular sports worldwide. Despite the popularity of American football, there are dangers within the game that have been discussed since its inception. One of the major dangers with the game of football are concussions. The most influential American football league in the world is the NFL, which holds the responsibility of setting the bar in terms of player safety for all other levels of football to follow. In an effort to reduce concussions in the NFL, they began studying the causes of concussions and the factors that can lead to them such as helmet choice, helmet safety rating, position, etc. With this in mind, they developed a helmet-safety rating system which conducts studies each season to determine which helmets provide the most safety for players from concussions. However, after doing extensive research, helmet type isn't the only major factor that goes into causing concussions for football players. Knowing that there are many other factors that play a role in concussions, after each season study, the NFL makes adjustments to its safety policies so that player safety is always upheld. Furthermore, with the constant evolution of helmet technology, safety-wear, and other things that help ensure player safety, there is plenty of evidence to research about the overall direction of the game of American football. My intended goal is to conduct extensive research with data from the NFL and other sources to examine different factors that cause concussions to answer my question: Is football heading in a safer direction for players and their safety?

The Sights and Sounds of My Study Abroad Experience in France

Jalen Rashaad Banks
Olivia Mambo Nche, Ph.D.
Department of Computer Science

This project/3D simulation is aimed to replicate and show some of my study abroad experience that I experienced and some of the sights I saw during the summer of 2022. The goal of this project/presentation was to add on to a previous website that I created to help showcase my experience and even convince someone to pursue an abroad opportunity for themselves. My main goal was to place an emphasis on and show the places I experienced unique culture shocks while abroad and to explain how to merge these with my own culture to help show that it is okay to step out of your comfort zone. I'm also aiming to show key details within the life in Europe with a precise emphasis on architecture, transportation, and city layouts; simply because these were the three biggest differences from America to Europe in my honest opinion. To sum it all up, the purpose of this project is to bring my study abroad journey to life to educate others on the experience and to convince them to pursue one of their own, simply because this is a once-in-a-lifetime opportunity.

Osteogenesis in the Avian Limb: A Study in Correlative Microscopy

Blake Bouknight & Ciera Carter
Jim Wetzel, Ph.D.
Department of Biology

Osteogenesis is the complex formation of bone and cartilage of the vertebrate skeleton. We studied this process using the chick embryo as a model system throughout the 21 day development period. Osteogenesis was studied using the combined techniques of photomicrography, histology, electron microscopy, and differential staining throughout limb bud development. This avian wing study can be translated to understand the osteogenesis of human bone due to the same developmental stage of gene-regulated proximal-to-distal outgrowth. Photomicrography was employed initially to examine the complexity of avian wing development. Histology slides were then created to evaluate the differentiation between bone and cartilage tissue while documenting the stage of development in which that differentiation occurs. Similarly, scanning electron microscopy utilized backscattered secondary electrons to show both the composition and topography of the limb at various stages. Finally, differential staining of the developing limbs allowed visualization of both cartilage formation and bone replacement. Through the combination of these different laboratory methods, we generated visual data to document the osteogenesis process. After the 72 hour mark (day 3), the avian limb bud develops a cartilage lattice. From hour 156 (day 6.5), progressive bone deposition will occur within the cartilage matrix and osteogenesis will proceed through hatching at hour 504 (21 days).

Gender Pay Gap in the Medical Field

Bryanna Marie Brady
Carla Hall Alphonso, Ph.D.
Department of Sociology

My research question is how societal gender norms in medical professions impact the size of the gender pay gap in that field. Within my research of the gender pay gap within different medical professions, I hypothesize that medical professions that are predominantly female will have a smaller, gender pay gap in salary compared to those that are male dominant. My null hypothesis is that the gender dominance in each medical profession does not ultimately affect the gender pay gap's size in salary. My overall method of data collection uses aggregate data sets with a sample size of 50 medical occupations. My two independent variables are the specific medical profession, and whether it is male or female, dominated. My dependent variable is the actual size of the gender pay gap in each profession. I will also have a control variable of the average salary within each profession. I present descriptive statistics for the variables in my analysis and conduct hypothesis testing techniques, which are presented and discussed.

The Reactionary Legacy of Southern Lesbian Literature

Emma Kate Bradley
Emily Taylor, Ph.D.
Department of English

Examining the American South as a place where heteronormative standards are expected and enforced, this research is interested in understanding how queer female authors responded to pervasive gendered attitudes. The characteristics of novels in this genre from the 1970s and 1980s, when women's liberation movements were growing, can be traced to contemporary novels written since the national passage of same-sex marriage in 2015.

Ancient Egypt

Malik Zyheir Jalil Busby
Olivia Mambo Nche, Ph.D.
Department of Computer Science

History is a beautiful story of where we as a human race have come from. Beneath our feet are ancient stories of the past, the ones that we know, and the ones we don't. Hearing stories of the past you can only imagine and picture how things looked back then. Now imagine if you could actually travel back in time and actually get to go back and experience one of the seven great wonders of the ancient world, which is Ancient Egypt. I have read plenty of research papers written by accredited historians that have also been reviewed by other qualified historians as well. This is to make sure I respect the great empire of Ancient Egypt and do it justice in how I depict it.

Evaluating the Metastatic Tendencies of Breast Cancer Cells Through the Lens of the Chorioallantoic Membrane (CAM)

Paige Cecilia Cairns
Austin Young Shull, Ph.D.
Department of Biology

An ongoing issue in the cancer research field has been furthering the knowledge and prevention of cancer metastasis through an ethically sound model organism that is relatively reproducible, easily manipulated, and performed with technical ease. The chicken chorioallantoic membrane (CAM) xenograft model is a unique and growing method to investigate cancer invasion and address the previously listed concerns. The CAM is highly vascularized, directly inferior to the eggshell, and made of tightly woven collagen; thus, simulating the basement membrane of human cells. Fertilized chicken eggs were incubated at 37 degrees Celsius for seven days. Following incubation and embryo development, SUM159 cells, an aggressive breast cancer cell line, were inoculated onto the chorioallantoic membrane of the developing chick egg. The hole was then sealed and the egg was incubated for an additional seven days, allowing for ample cancer and embryonic growth. Spherical tumor growth was visualized on the CAM while significant vascularization and angiogenesis proliferated around the tumor. Various histology techniques and SEM imaging were used to demonstrate tumor development, metastasis, and vascularization. Aggressive SUM159 cells deteriorate the CAM and invade distal tissues and blood vessels, allowing for metastasis and cellular growth commonly seen in patients with breast cancer. The chorioallantoic membrane model allows for a model organism that is quickly reproduced, easily altered, and requires minimal technical involvement. When inoculated with SUM159 cells, it proves to be a strong model that allows for the visualization of the development, angiogenesis, and metastasis of breast cancer cells. This model is a low-cost, energy-efficient way to demonstrate the abundant, aggressive nature of metastatic breast cancer.

The Study of Cognition Growth In Education Using Virtual Reality

Taylor Cole Cochran
Olivia Mambo Nche, Ph.D.
Department of Computer Science

Virtual reality (VR) is a technology that combines different senses to be used to interact with a virtual world. Such a technology has the potential to provide benefits in many fields such as entertainment, education, and simulation. In this study, the objective is to determine if using virtual reality will let the mind explore creative paths for art pieces. In order to make a set conclusion, an application will be used where the user can place blocks in a three-dimensional environment to create pixel art. An even number of people will be selected to participate in these tests. What is needed is for all the people participating to be on a similar skill level with pixel art. The placebo side of the experiment will be assigned a prompt while the others will freely use the application to create anything they want. Being able to measure the results of the test will have the art compared between the placebo and virtual reality users. The virtual reality users will be handed a random prompt from the pool of placebo tests to make the comparison. The final results of the test should show an increase in the quality and detail of the artwork between the experiment group and the placebo group.

Benthic Foraminifera as Indicators of Sea Level Change Between the Donoho and Peedee Formations in Florence, South Carolina

Kenedie Taylor Conaway
Michael O. Rischbieter, Ph.D.
Department of Biology

Microfossils, the fossilized calcareous remains of small or partial marine organisms, are useful for reconstructing past environmental and stratigraphic relationships. Previous studies have used macrofossils, microfossils, and nannofossils to support the likely paleoenvironmental and biostratigraphic layout of specific localities on the Eastern coast of both North and South America. However, little research has been done that focuses on the diversity of benthic foraminifera of the Peedee Formation, an important sedimentary layer that contains fossils (belemnites) that have been used in isotopic studies worldwide.

This study seeks to qualitatively analyze the shape and ornamentation and to identify the genus of benthic forams between the older Donoho Formation and the younger Peedee Formation for the purpose of confirming a rise in sea level between the Campanian and Maastrichtian ages of the Cretaceous Period. To confirm this change in the paleoenvironment, sediments were first collected from the Donoho and Peedee formations at the Burches Ferry locality in Florence, SC. Samples were then sent to Global GeoLabs for microfossil and palynology processing. The returned samples were photographed using light microscopy to obtain images showing rough morphological features. Sediment from each layer was then prepared for SEM imaging for more detailed qualitative morphological analysis and identification. Morphological analysis revealed morpho-types in the Donoho layer that suggested a nearshore to outer shelf environment, whereas the morpho-types from the Peedee layer were suggestive of outer shelf to the abyssal range. Simultaneously, a small sample was taken from each processed Donoho and Peedee layer to remove all benthic forams for a quantitative analysis of genera, revealing that genera Globulina and Pseudovigerina appeared in higher layers of the Peedee formation, well into the

Maastrichtian age. Taken together, this study provided a more precise biostratigraphic analysis of the Peedee and Donoho formations in Florence, SC, tracking a rise in sea level using the often-neglected diversity of benthic foraminifera.

Reexamination of the Relationship Between Institutional Expenditures and Student Graduation and Retention

Seth Ayden Cooper
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

I am replicating the work of Dahlvig et al. which is titled, Institutional Expenditures and Student Graduation and Retention. This paper seeks to explain the relationship between different institutional expenditures and the rate at which 1) students return to the same institution after their first year of study and 2) students graduate. I examine the relationships of interest using regression techniques like those utilized in the papers. It is important that institutions understand this relationship, because if retention and graduation rates are impacted by specific spending types, then knowing what to prioritize while budgeting will be simpler, assuming that their goal is to maximize positive student outcomes. Additionally, the study discusses how awarded aid affects student outcomes, which if the relationship is positive would support additional funds being directed towards financially supporting students. This study uses data collected from the IPEDS, and the institutions included are those listed as members of the Council of Christian Colleges & Universities (CCCU).

Examination of the Effects of Faculty Compensation and Level of Experience on Student Outcomes at 4-Year Southern Colleges and Universities

Seth Ayden Cooper
Suzie Smith, Ph.D.
Department of Economics and Business Administration

Literature has shown that compensation and work experience are linked to improved employee performance. Four-year institution faculty are essential determinants of student outcomes; thus, their performance is essential to the institution's success. Retention, graduation rates, and graduate earnings are outcome metrics used by institutions to benchmark effectiveness. Due to the COVID-19 pandemic, institutions are falling short in these areas. Through regression techniques, this research determines that instructional staff experience and compensation significantly impacts each of these metrics. Therefore, through optimized human resources policies, institutions could indirectly influence student outcomes thus improving their ability to meet desired benchmark figures.

The Role of Saccharomyces Cerevisiae as a Model for Niemann-Pick Type C Disease and Its Potential Treatment

Itzel Martinez Coria
Margo Petukh, Ph.D.
Department of Biology

Niemann-Pick type C1 (NPC1), a large multidomain transmembrane protein, coupled with much smaller soluble protein NPC2, and its function involves low-density lipoprotein derived cholesterol (CLR) delivery from late endosomes and lysosomes to the endoplasmic reticulum and other cellular compartments. Mutation in either NPC1 or NPC2 causes Niemann-Pick type C disease, a lysosomal storage disease in which there is an intracellular accumulation of LDL-derived cholesterol, sphingomyelin, and other lipids in endosomes and lysosomes and delayed induction of CLR homeostatic reactions. In order to study this mutation Saccharomyces cerevisiae was used to study the gene NCR1, which is a homolog of the human NPC1 protein. This study attempts to characterize N178D point mutant in NCR1 protein in yeast and identify the phenotypes in the point mutant, wildtypes, and deletion strains to then be able to propose small FDA approved molecules to restore wildtype functioning. In the evaluation of NCR1, we used site-directed mutagenesis to attempt to create the N178D point mutant, and ROS and mitochondrial morphology studies to classify phenotypes within wildtype and deletion strains. We hypothesize that there may be a defect in mitochondrial morphology as well as a greater sensitivity to oxidative stress within deletion strains. The results of this study may be useful indicating S. cerevisiae's role as a model for the mechanism of Niemann-Pick disease in humans and delineating FDA approved drugs as potential treatment of NPC1.

A New World of Virtual Reality

Trey Matthew Davis
Olivia Mambo Nche, Ph.D.
Department of Computer Science

The project that I am creating is composed of many ideas that also serve an educational purpose through learning new ideas with code and design qualities. This project also serves the goal of using Virtual Reality for game development, which is a new concept for most of the world today. Virtual Reality is defined as a simulated experience that gives a user a close 3D display that gives an immersive feel of a virtual world. The main goal of the project was to create an endless runner game, similar to games such as temple run, subway surfers, etc. Creating an endless runner videogame in VR would be hard, but it's a simple concept that includes running, jumping, and sliding to dodge many different obstacles. This application is useful in the sense of entertainment, but it can also be edited in a way that will allow students to learn and be entertained while playing the game. Given the recent popularity of VR, creating an application for this service will shine a light on the capabilities of VR and the development skills of the students.

Effects of Calcium Free Seawater on Development of *Lytechinus variegatus*

Jessica Ferqueron and Kyle Decker
Jim Wetzel, Ph.D.
Department of Biology

In our Physiology research we studied the effects of calcium-free seawater on the development of the short-spined sea urchin, *Lytechinus variegatus.* By injecting mature *Lytechinus* with a 0.5M solution of potassium chloride, we extracted viable eggs and mature sperm. A dilute sperm solution was then made in natural seawater and mixed with the eggs to induce fertilization. Following cleavage of the embryo, andcalcium prior to gastrulation, developing embryos were transferred to artificial seawater that we prepared with the same chemical content as natural seawater except lacking calcium.

It is known that the calcium ion is essential for the maintenance of cell-to-cell junctions and cellular metabolism during subsequent development. The embryos that were cultured in the natural seawater matured normally while those that were transferred to the calcium free seawater arrested in late cleavage. As the mesenchyme rearranged, the cell-to-cell junctions were unable to form and accordingly the tissues eventually broke down into individual cells.

A Few "Good" Men

Elizabeth Lath Freeman
Stefan Wiecki, Ph.D.
Department of History

Oskar Schindler, Raoul Wallenberg, and Carl Lutz were three of a very small list of names who risked their lives in order to save those who were helpless during the Holocaust. Each of these three men have different but wonderful stories of how they found themselves in a situation to help Jews, and what they risked to do so. None of these men came from extraordinary backgrounds or were deemed heroic before the Holocaust. However, they saw the injustices that were happening to these poor people and decided to make a stand, even though they knew they could face the same fate as the people they were helping. When looking at Oskar Schindler, Raoul Wallenberg, and Carl Lutz, and their impact on the Holocaust, it is hard not to think that if there were more people who used their opportunities and positions in life, the Holocaust might not have been as bad, or maybe it would not have even happened at all.them to act on behalf of Jones, no matter what his instructions were.

Classifying Mutations with Unknown Clinical Significance in the Human NPC2 Protein

Laken E. Fulmer
Margo Petukh, Ph.D.
Department of Biology

The NPC2 protein plays an essential role in cholesterol transport within an organism. Certain mutations in this protein lead to Niemann-Pick disease type C2, which results in the accumulation of cholesterol in lysosomes leading to decreased motor coordination, reduced muscle tone, and other symptoms. This study aims to evaluate 21 novel mutations with unknown clinical significance with bioinformatics tools and predict the plausible pathogenicity (i.e., benign or pathogenic). With data mining, we evaluated demographic information, frequency, onset, and the gender-specificity of each mutation in question. We performed evolutionary analysis using a newly developed in-house algorithm written in Python to study the conservation of residues within orthologous sequences. Residues involved in NPC2 stability, "hot-spots", were deciphered with the alanine-scanning technique. We predict that 9 mutations of highly conserved residues that are crucial for protein's stability (A19D, E20K, S24W, V30M, V57I, K71R, D91N, N98H, T107I) are pathogenic and can cause Niemann-Pick disease type C2. Those mutations are commonly detected at advanced life stages. Our findings will be further evaluated to find a phenotypic difference, to study the effect of mutation on protein's structure/function, and for further drug discovery to find a small molecule that, upon binding to the protein, can restore its wild-type activity.

Injuries During Return to Sport After the COVID-19 Lockdown

Ignacio Gallego
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

My topic talks about how Italian Serie A professional players return to the sport after the covid-19 blockade. The article I am going to expose talks about how athletes were injured more frequently after covid-19 blockade compared to injuries recorded before covid-19. This article is a study conducted on how covid-19 affected professional soccer players and divides its study into three different study phases; in which it compares the injuries sustained both in training and in match play from the three study phases mentioned above. Each study phase represents a different time period in which a different number of injuries are recorded. Each injury is influenced by numerous variables such as age, weight, games played, player position, etc. that can affect the type of player injury. The main question raised by this article is that COVID caused professional players to be injured more frequently and more easily after COVID blocking compared to the pre-COVID period. In conclusion, my goal is to analyze the data in order to prove this theory and answer my questions about what reasons cause players to get injured so quickly.

Camp Wide Celebration Worship Experience

Jimmy Lee Gary, Jr.
Julie Meadows, Ph.D.
Department of Religion and Philosophy

This is a presentation that will highlight the Camp Wide Celebration Worship Experience that is scheduled to take place on Thursday March 30th, 2023.

Experiences of Female Pastors in the Baptist Denomination

Jenna Grace Greene
Julie Meadows, Ph.D.
Department of Religion and Philosophy

Many female ministers are faced with a lack of acceptance from the Baptist denomination because, "according to Scripture," the pastoral position belongs only to men. Through research and conducting my own interviews, I have found that because of their gender, a great number of women in ministry face significant challenges from Baptist churches, associations, and church members. This presentation will discuss a number of female pastor's call to ministry, their personal accounts of challenges they have faced in the Baptist denomination, and positive impacts they have had on their church and community. Furthermore, we will discuss why churches can benefit from having female pastors and how the Baptist denomination is doing an injustice to the Christian faith by keeping women out of the pulpit.

The Cuban Missile Crisis: Putting The Focus Back on Cuba

Rafael Blas Guerra
William J. Harris, Ph.D.
Department of History

The 1960s American history covered many historical events that created a pivot and direction of the relations between Cuba and the United States. Depending on the tactics employed, the ideals of communism, also known as Marxist ideology, can sound appealing. This movement has gained ground in Europe and Latin America, aiming to eradicate inequality, injustice, and class exploitation. Still, these political ideologies led to corrupt governments and the end of democracy. Communism is an issue in the United States because our government's standards stand on democratic elections and capitalism. However, how did Cuba slip through the United States' radar, making them the first Communist country in the Western hemisphere? How did the Cuban Missile Crisis's events play a role in the relationship between Cuba and the United States, leading toward a close nuclear war? Furthermore, how did it create a greater fear of communism in the 1960s? To better understand these questions, we must realize the Crisis, on how Cuba played a significant factor in this historical event against the United States, and they are the leading actor.

Conveying Abstract Concepts in a Fun Way

Isaiah Lugene Hawkins, Jr.
Olivia Mambo Nche, Ph.D.
Department of Computer Science

There have been studies showing that most students that decide to take computer science studies in college the dropout after their first few classes. Research has shown that due to a coding language syntax, and abstract concepts a lot of students find it overwhelming to be able to learn something that deals with concepts that are abstract and worrying about the specific syntax of a computer language. This study is investigating the effectiveness of introducing video games as a medium that can teach abstract concepts using an interactive style of play, along with visual learning to see how the program is being carried out. Based on the statistics given by reports, tests were conducted where coding games were introduced to K-9, while there were more educational games being given to high school students to see if this could help them learn simple concepts. Analysis shows that when doing this, the children had a more positive look at programming and increased their interest in computer science studies along with being more engaging. By using educational video games, this could help children interested in computer science studies to feel less overwhelmed and more confident in their ability to understand and grasp the more abstract concepts that come in computer programming. Using the holographic features, this gives the student a look at the information that is being presented to them, because the hologram will act as the computer registry and will be able to effectively create a more engaging environment for learning.

Gender Inequality in Sports

David DeJuan Herring, Jr.
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

My research proposal is based on gender equality in sports or the lack of. It is based on the history and how that history connects to the current stake of sports today and the opportunities presented by gender. My research question is: how does the history of gender equality in sports effect the current position of gender opportunities? The main idea surrounded around my research is how much opportunities have changed for women on each level of sports, starting for the high school, to college, professional and Olympic levels. This information in the research paper was supported by a graph that provided the percentage of athletes and the number that were female from two separate time periods and compared them to the number and percentage of male athletes. The research paper also provides a historical understanding of how far the female gender has came, from having to play the role of working just to support their husbands in the 18th Century to being able to compete with similar opportunities to men.

Game Shows as Teaching Tools

Obed John Hessou
Olivia Mambo Nche, Ph.D.
Department of Computer Science

This paper explores the potential benefits of using popular game shows as a teaching tool to enhance student engagement and learning outcomes. Game shows have a long history of entertaining audiences while providing education and knowledge. The incorporation of game show elements in the classroom has the potential to create a more interactive and engaging learning environment. By leveraging the appeal of game shows, educators can motivate students to actively participate in the learning process and increase their understanding of complex concepts.

This paper reviews existing research on the use of game shows in education and provides examples of how game show elements can be incorporated into the curriculum across various subject areas. Additionally, this paper discusses the challenges and considerations associated with using game shows as a teaching tool, including ethical concerns and potential negative impacts on students′ self-esteem. Ultimately, the use of popular game shows can offer a unique and effective approach to teaching that can benefit both students and educators.

The Men Behind the Wannsee Conference of 1942

Payton J. Hibler
Stefan Wiecki, Ph.D.
Department of History

The Holocaust was never a plan made in one day, by one man. It was a plan made in one day by 15 men. Labeled as the Wannsee Conference of 1942, these men met in secret to determine the lives of millions of innocents. What happened during this meeting, and what happened to these men, is all covered within my research. And whether these men deserved their punishments, is my argument.

Chronic Progressive External Ophthalmoplegia: A Chiropractic Case Study

Eva Marie Hinkleman and Blake Bouknight
Jim Wetzel, Ph.D.
Department of Biology

As a research topic in Physiology, we selected an alternative and non-surgical treatment to alleviate chronic pain associated with Progressive External Ophthalmoplegia, a neuromuscular dysfunction disorder. Our research is an analysis of clinical journals specific to a career in Chiropractic health care. A 66-year-old patient was diagnosed with Progressive External Ophthalmoplegia (PEO) and Bilateral Vestibular Hypofunction (BVH). PEO is a disease that causes excessive mitochondria within the muscles. In patients with PEO, a biopsy of muscle shows a ragged and dysfunctional muscle. This dysfunction can largely affect the eye muscles, specifically the Levator Palpebrae and Orbicularis Oris, causing ptosis. BVH is a vestibular apparatus condition that causes postural instability, visual blurring during head movement, and dizziness. The mechanisms of how it works and what causes it are largely unknown and no pharmaceutical treatments are available. The patient underwent chiropractic treatment and was monitored before and after care with tests. These tests measured the patients balance, eye movement and gait. Overall, the treatment was successful in increasing the patient's confidence in his movements while improving the state of ptosis and vestibular function; this increased his quality of life. This research is pressing because these diseases are often only treated through surgery. In this study, chiropractic manipulation was less expensive and less invasive than surgery would have been.

Impact of 2017's Tax Cuts and Jobs Act on Individual Taxpayers in Five U.S. States

Colleen Alyce Hirt
Karen Mattison, M. Acc., CPA
Department of Economics and Business Administration

Individuals in the United States have been paying taxes on their income since the ratification of the 16th amendment in 1913. In fiscal year, 2021, thirty percent of the federal income was from individual income taxes. At the end of 2017, Congress passed the first major tax act since the Tax Reform Act of 1986. This tax change is referred to as the Tax Cuts and Jobs Act (TCJA) and became effective at the beginning of the 2018 tax year. The major goals of the tax act related to individual taxpayers were to lower marginal tax rates on income and simplify the tax forms and code to allow individuals to understand how to complete their return. The context of this research is to study the effects of the TCJA of 2017 on individual taxpayers from South Carolina and four other states with similar populations from each United States region. Other states in the research are Minnesota, Colorado, Oklahoma, and Maryland. The central question this study addresses is to examine the impact of the TCJA on individual taxpayers in the five states listed above. The methods used to determine the findings include using Excel, Tableau, and other analytic programs to analyze the Statistics of Income published by the Internal Revenue Service for tax years 2017 to 2019.

The Impacts of Gender Stereotypes on Female Accountants

Colleen Alyce Hirt
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

Women in the workforce face a considerable setback due to gender stereotypes and a pay gap regardless of the Equal Pay Act being passed in 1963. Over time, people tend to see women as stay-at-home workers by keeping up the house and taking care of the children, yet over time we have seen an increase in women going into the workforce and excelling in jobs that men typically would do. However, there is a large percentage gap in women partners in an accounting firm, only 23% are female. As a woman going into the accounting field, I want to investigate the gender gap in the workforce, what could be contributing factors to the gap, and what we, as a society, can do to narrow it. In this research, I examine the relationship between male and female salaries in the accounting workforce using data from each college and university in the eastern region of the United States. I examine this by using the College Scorecard data set which lists the average earnings per graduate with an accounting degree from institutions in the US. My hypothesis is that there will still be a clear difference in pay between women and men who are in the accounting workforce.

The Utilization of Nazi Propaganda Before and During World War II to Create an Antisemitic Environment

Thomas Barker Hollingsworth III
Stefan Wiecki, Ph.D.
Department of History

During WWII, Nazis used propaganda to create an antisemitic environment and this was done from the inside in a meticulous way. Nazis had a certain way of presenting the propaganda to the public to create such opinions and to sway the audience. This paper examines how propaganda was created and the details the process in which it was created. I will be researching how the propaganda was presented to the audience and the process of which it was created from inside the Nazi regime. This paper suggests that Nazis had the creation and utilization of propaganda down to a science.

A Reinvestigation of the Introduction of Video Assistant Referee and its Effect on Home Advantage in the German Bundesliga

Connor Hudson
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

Soccer fans and pundits had long been calling for a way to make the sport more fair, specifically when it came to referee bias and home field advantage. The implementation of Video Assistant Referee (VAR) in the German Bundesliga in the 2017/18 season was the German Football Association's first attempt at solving this issue. With the use of game data across eight seasons and 2448 matches from Germany's most prestigious soccer league, I analyze variables such as goals, points, fouls, yellow cards, second yellow cards, red cards, and penalties to find how impactful the introduction of VAR was on the fairness of the game. Through one-sample t-tests and other various data analysis techniques, I test the hypothesis that VAR has improved the overall fairness of soccer, limiting home advantage, primarily through the variables that are directly related to refereeing decisions in soccer games—i.e., fouls, yellow and red cards, and penalties.

The Bluehose Brew: A Café Community

Liliana I. Jaraczewski
Julie Meadows, Ph.D.
Department of Religion and Philosophy

As the culminating project of this year's Building Community course through the department of Religion and Philosophy, I designed and instituted a campus "coffee shop" on the weekends. At "The Bluehose Brew," students were welcome to study, enjoy a warm beverage or snack, and relax in the café environment. The goal of my project was to offer a focused, yet welcoming environment for students to find community through their common academic pursuits. This project was formulated especially for students who find social fulfillment within quieter settings.

The Effects of Gold and Silver Nanoparticles on the Curing and Antimicrobial Properties of Commercial Clear Coats

Liliana I. Jaraczewski
Latha A. Gearheart, Ph.D.
Department of Chemistry and Biochemistry

Commercial clear coats, as well as surface coatings as a whole, have applicability in the industrial, home, and medical fields. Their cure rate, as well as their microbial-resistant properties, are of interest to improve efficiency and efficacy in these settings. In this study, gold and silver nanoparticles (Au NPs and Ag NPs, respectively), were added to polyurethane (oil-based) and polycrylic (water-based) commercial clear coats to determine their effect on the cure rate and resistance to biofilm growth. The drying and/or cure rate of the clear coats were expected to accelerate with the addition of Au NPs or Ag NPs due to the localized energy provided by the surface plasmon resonance on the surface of each metallic NP. These NPs, synthesized by a wet chemical reduction of a gold or silver salt, were added to polycrylic clear coat. Viscosity measurements and optical density determination over time were used to measure curing and drying. The experiment was repeated in both dark and light conditions with different concentrations of NPs. Preliminary data suggests some differences between Au NPs and Ag NPs at varying concentrations, compared to control groups. Furthermore, Au NPs were functionalized using cetyltrimethylammonium bromide (CTAB) and were successfully added to polyurethane clear coat. Functionalized NP-clear coat solution was measured for viscosity, optical density, as well as IR spectra changes over time. IR data demonstrate a change in the O-H bond region that may indicate a chemical shift within the clear coat during the curing process. Additionally, the antimicrobial properties of polycrylic solutions with either Au NPs or Ag NPs were analyzed for biofilm growth using a strain of Acidovorax avenae bacteria. Preliminary data from surface adherence assays suggest that polycrylic-Ag NP solutions may prohibit bacterial adherence on a plastic surface. However, further study is needed to derive detailed conclusions.

Toastmasters International

Yusuf Ubaidulloevich Jomiev
Julie Meadows, Ph.D.
Department of Religion and Philosophy

My project this semester in the Building Community class is to start a chapter of Toastmasters International at PC. This organization helps people overcome their fear of public speaking, gain leadership skills, and make new friends. I think it will be a valuable contribution to the PC community.

Total Rehab

Jalen Kristopher Jones
Olivia Mambo Nche, Ph.D.
Department of Computer Science

This virtual reality program will seek to improve people's mental and physical health all in one reality. It will allow people to help themselves without having to leave the house. It is more convenient for people who can't physically go out or people who mentally aren't in the mood or for people who need an alternate method to relieve stress. This reality is for people who seek to get stronger physically and/or mentally. It is multipurpose for people who have different goals. It can be used for exercise, physical therapy, stress relief, relaxation, and improving mental health through exercise. The main objective is to make the mind and body stronger together in unison. There have been numerous studies done on how physical activity improves the mental health of individuals. There also have been numerous studies on how colors can affect our mental state as well. The virtual reality created puts both of these studies into effect at every turn. What the person sees and their movements are the two biggest factors within the virtual reality that will help the person achieve their personal goals. The virtual reality created gives options so that a person can focus on their mental health or their physical health or they also have the option to combine the two with different activities. This allows a person to put in the work themselves and feel no pressure from external forces. This virtual reality gives a person a certain confidence because they are doing what's best for them at that time and they are choosing to do it on their own. The person is choosing to experience better physical and mental health. When a person chooses a healthier life for themselves and puts in the work for themselves it makes all the difference.

Minorities in America

David Alexandre Kinard, Jr.
Carla Hall Alphonso, Ph.D.
Department of Sociology

This research analyzes negative interactions between the public and the police force. The research question follows: Are racial minorities significantly more likely to have negative interactions with police? My hypothesis is that racial minorities will have significantly more negative interactions with police, compared with whites. My data comes from the BJS 2018 Public-Police Contact Survey. The IV is whether or not someone is a racial minority and DV the amount of negative interactions they have with police, as documented in this survey. The control variable that operates will be the respondent's age and sex. My results show descriptive statistics for all variables and findings using techniques of hypothesis testing in SPSS. Findings are presented, and their implications are further explored.

Using Yeast as a Model for Niemann - Pick Type C -1 Disease

Evelyn Christina Kitchko
Evelyn Swain, Ph.D.
Department of Chemistry and Biochemistry

Niemann - Pick type C1 (NPC1) is a protein that is important for transporting cholesterol in the body. The NPC1 and NPC2 genes in humans regulate movement of cholesterol and sphingolipids in the body. NCR1 and NPC2 are the equivalent yeast homologs. Mutations in these genes can lead to an accumulation of cholesterol in the liver, spleen, or lungs. These mutations lead to Niemann- Pick Disease which causes neurodegeneration and early onset death. There are currently no effective treatments for NPC1, but experimentations with Miglustat are found to help treat mild to moderate cases. It has been discovered that a point mutation that changes from an amide to an acid causes issues. But, with further experimentation and drug screening using yeast, specific drugs that are sensitive to the NCR1 gene, in yeast, can be used to fix the phenotype, which allows for further treatment to be available. Using yeast as a model to study Niemann - Pick disease, studies aim to elucidate the phenotype of the novel point mutation in the yeast (NCR1) homologe of mammalian NPC 1. The FDA approved drugs may/ will reverse the negative impact of the point mutation.

The Future of the MPJE

Gabe Rhyne Knight
Mary Douglass Smith, Pharm.D.
Pharmacy School

Two separate houses of delegates discussed the future of the pharmacy multistate jurisprudence exam (MPJE) at the Association of American Colleges of Pharmacy (AACP) and National Association of Boards of Pharmacy (NABP) meetings in 2022. Each organization supported different resolutions (1, 2) regarding the future of the MPJE. The MPJE is owned and developed by NABP and must be passed for each state and jurisdiction prior to licensure. (3) To be better prepared for future discussions of the use of state-specific and stand-alone law exams for professional licensure, this study examined the licensure requirements of 42 professions and 74 licenses available in the state of South Carolina.

The authors reviewed and recorded the information provided on the South Carolina Labor, Licensing and Regulation website, a regulatory state agency that oversees the licensing of 42 profession and occupation boards and commissions. (4) Of the 74 licenses available in South Carolina, 65 require at least one examination, 33 have law content on the examination, and 16 have a standalone law exam, including pharmacy.

SS Officers' Escape to Argentina Post WWII

Kelli Jayne Kragh
Stefan Wiecki, Ph.D.
Department of History

Many people and organizations made it possible for thousands of SS officers to escape to Argentina and other South American countries following the liberation of the concentration camps. I will discuss who these people who were responsible for assisting this hidden operation, as well as analyzing notable SS officers' escapes and how they each received aid in escaping, how long they hid, and if they were persecuted for the crimes they committed.

How Do Customers Change Their Purchasing Behaviors During the COVID-19 Pandemic?

Elizabeth Faye Lane
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

The COVID-19 pandemic had and continues to have an impact on our daily lives. The spread of COVID-19 as well as enhanced safety measures had some effects on consumers' normal shopping behaviors. This study is centered around how customers' shopping behaviors have changed during the pandemic. This analysis is done by examining the three primary modes of shopping for customers: online purchases, curbside pickup, and in-store shopping. For this research two groups of independent variables were identified, fears for health and fears for financial conditions due to COVID-19. Demographic variables such as age, gender, race, and income were also used as independent variables to see if they impacted the change in shopping behaviors. The data used is from the Census Bureau's Household Pulse Survey that was collected during the pandemic and logistic regression was used to analyze the data to test the effects of the independent variables on the changes of customers shopping behaviors in the three modes of shopping. The results suggest that both fears for health and fears for financial conditions have an effect on the shopping behavior changes, where customers adjust their behaviors to deal with or avoid the risks. The demographic variables also had an impact in their shopping decisions. Understanding the changes in shopping behaviors can help us predict the future of our economy and figuring out how to best serve customers' needs.

P-gp Substrate of Reflux Medication Induces Drug Resistance and Promotes Cancer Growth in Esophageal Tumor Cells

Mayah Codyn Lee
Christopher Farrell, Ph.D.
Pharmacy School

The understanding of pharmacogenomics as a way to analyze the expression of genes correlated to a specific drug response can significantly benefit the method of treatment for cancer patients. The American Cancer Society estimates esophageal cancer as having "(about) 21,560 new…cases diagnosed," and "(about) 16,120 deaths from esophageal cancer" in 2023. In 2020, around 544,076 people died from esophageal cancer worldwide. There have been extensive genomic studies on genes that over-express or under-express in cells, which could correlate to a chemo-resistant effect in chemo-naive cells. Genes such as DDIT3 and CST1 were reported to be underexpressed and overexpressed, respectively, in esophageal cell lines (OE19 and OE33) when treated with anti-acid reflux medication, omeprazole, and resulted in a poorer response to chemotherapies. Gene expression analysis was done by performing a polymerase chain reaction (PCR) on a colorectal cell line (Caco2) targeting the genes DDIT3 and CST1. This could have implementation for early screenings of cells exhibiting chemo-resistant behavior before treatment with chemotherapy, hopefully leading to a better prognosis if a patient is to develop esophageal cancer.

Induction of Cancer Resistance in A549 Cells

Patrick Ronald Leonard
Amy Messersmith-Love, Ph.D.
Pharmacy School

Individuals with mental illnesses have increased mortality to various types of cancers, including lung carcinoma. While this cancer already has one of the highest mortality rates of all cancers, the rate is further increased when combined with mental illness. In studying this disease, our target demographic was schizophrenia patients. This group is at a higher risk for lung carcinoma, as one of the most important factors in lung cancer is smoking, and the smoking rate in patients with schizophrenia is ~15% higher than the general population according to the CDC (~40% compared to ~25%). Patients who undergo general chemotherapy have a risk of developing multi-drug resistance (MDR) through overactivity of efflux pumps, which have a non-specific affinity for many mental health drugs. One such pump is p-glycoprotein (PgP), encoded by the ABCB1 gene, whose overproduction results in an MDR phenotype. In this study, we looked for the expression of the ABCB1 gene product in culture dishes treated with different drugs. We used the A549 cell culture, a non-small cell cancer line from a 58-year-old patient with lung carcinoma and treated the cells with three antipsychotics used to treat schizophrenia: aripiprazole, olanzapine, and quetiapine. RNA was extracted from these samples, converted into cDNA, and amplified using rtPCR. This is an in-progress study. While we have analyzed the data from the ABCB1 gene product at the three- and six-month time periods compared to an actin housekeeping gene, we expect to see a potential for greater resistance around the nine month and one year mark (around May and Late July/August).

Investigating the mechanism of co-suppression between Rvs161 growth defect and Hxt4 overexpression in Saccharomyces Cerevisiae

James Crawford McCollum
Evelyn Swain, Ph.D.
Department of Chemistry and Biochemistry

In the budding yeast Saccharomyces cerevisiae, Rvs161p is a protein that plays a crucial role in endocytosis and its deletion mutant displays numerous defects, namely the inability to grow on low glucose. However, this defect is suppressed by overexpression of HXT_4 glucose transporter (HXT_4OE). Our research specifically focused on identifying the structural and physical requirements for proper yeast glucose transporter function, in order to determine and better understand the mechanism behind the co-suppression seen between the rvs161 delete and HXT_4OE. By studying and understanding these interactions, the obtained knowledge can be applied to humans in the context of type 2 diabetes and the relevant mechanisms of insulin signaling and sugar uptake.

We hypothesized that the mechanism of co-suppression is related to the maintenance of proper sugar transporter ratios at the plasma membrane. Under starvation conditions aberrant transporter ratios could lead to a low glucose defect while restoration of these ratios could suppress the defect. We hypothesized that endocytic defects could cause a low glucose defect and that reestablishment of proper endocytosis could suppress the defect. We hypothesized that respiratory defects could explain the low glucose defect while recovery of proper respiration could suppress the defect.

Using fluorescent microscopy in conjunction with a fluorescent glucose analog, 2-NBDG, and a fluorescent endocytic marker, FM 4-64, we were able to observe glucose uptake and endocytic pathways directly. Additionally, we used propidium iodide staining to understand membrane permeability under various conditions. The research's significance lies in providing a better understanding of interactions between glucose transporters in yeast. FM_4-64 results showed unusual staining in mutant

cells. 2-NBDG results showed somewhat reduced uptake in some conditions for some mutants, and zero uptake for other mutants. Hxt2p-GFP showed expected localization in wild type cells, while the transformation failed for the other mutants. Propidium iodide staining showed that strains overexpressing Hxt4 were impermeable while some other strains were slightly permeable.

FM4-64 analysis shows that in some mutants this endocytic marker accumulated in multi-vesicular bodies within each cell. This suggests a trafficking defect. 2-NBDG uptake met expectations in some strains and did not uptake at all in others despite numerous experimental repeats. We believe this matter should be investigated further. Propidium iodide staining provides basis for further exploration of the role of membrane dynamics in the co-suppression.

The Relationship Between Participation in Sports and Academic Achievement

Owen Cooper McCormack
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

There has always been a stigma around the relationship between sports and academia. Scholars argue athletics takes away from schoolwork and affects the achievement of the individual in the classroom. From my personal experience, I believe this to not be true. To answer this question, I will be using adolescent data from the Longitudinal Study conducted by the National Center for Education Statistics in the early 2000s. Using two logistic models and an ordinary least squares model, there will be both positive and negative correlations between the several variables being analyzed. Not only do athletics affect achievement but race, capital, and educational effects are some of the other variables included that will be explored. Athletic participation with the combination of race, educational effects, and cultural effects will have a positive effect on academic success.

Chicago, Cronkite, and Consequences: Media Coverage and the 1968 Democratic National Convention

Avery Lee Milhorn
William J. Harris, Ph.D.
Department of History

Amidst a year of assassinations, anti-Vietnam protests, violence, and political unrest in the streets of America, the Democratic National Convention convened in Chicago to select the party's new delegate for the 1968 presidential election following President Lyndon B. Johnson's decision not to seek a following term in office. This three day meeting period in late August is often remembered by the violence that occurred both inside and outside the convention hall between delegates and party leaders and protesters and the police as all of it was captured by the media for the average American citizen to view at home. In November, Richard Nixon and the Republican Party won the election under the infamous "law and order" campaign while several protestors from the convention were put on trial under what became known as the Chicago 7. In the aftermath of its convention, the Democratic Party reformed its process of selecting presidential delegates in an attempt to better reflect the country's democratic principles. This paper seeks to examine the impact of media coverage in the political and societal consequences in the wake of the 1968 Democratic National Convention.

A House Tour in Unity 3D

Logan Sarratt Nichols
Olivia Mambo Nche, Ph.D.
Department of Computer Science

I am working on a 3D project that is meant for those who are looking into making a little exploration type of simulation. It would be beneficial for those who like to experience something that isn't within their reach or not capable of viewing things from their own point of view. It will even display how much effort that was put in while making this project using Unity in my Computer Science Capstone class. This project is small, but it is something that I thought I could work up in a matter of a semester and the idea was fresh on my mind. The expected goals I want to accomplish from this is for it to work as it should, inspire those that are looking into making virtual tours like this, and even entertain the users as they test the project themselves.

How EU Countries Recovered Since the Covid-19 Pandemic

Jose Omosigho Lado Okoro
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

This presentation is about measuring the impact of the Covid-19 pandemic in the economy of the countries of the European Union, based on previous and current economic metrics and using them to predict the potential future results we can determine how the EU countries dealt with the global pandemic in economic terms.

Effects of Nitrogen Starvation on Sphingolipid Metabolism in Saccharomyces cerevisiae

Mykayla S. Overton
Evelyn Swain, Ph.D.
Department of Chemistry and Biochemistry

The biosynthesis of sphingolipids begins with the condensation of serine and palmitoyl-CoA to form 3-ketosphinganine, which is subsequently reduced to sphinganine. Sphinganine is then acylated to form dihydroceramide, which is further modified by the addition of various head groups containing nitrogen to form different classes of sphingolipids, including ceramides, sphingomyelins, and glycosphingolipids. The precise composition and distribution of sphingolipids within cells are tightly regulated and play critical roles in maintaining cellular homeostasis. Sphingolipids can also be metabolized by the sphingolipid degradation pathway, which involves a series of enzymatic reactions that break sphingolipids down into smaller molecules for recycling or excretion. Defects in sphingolipid metabolism have been implicated in a range of human diseases, including neurodegenerative disorders, metabolic disorders, and cancer. However, there are still many components of these metabolic pathways that remain to be understood. The goal of this study is to elucidate the inner workings of sphingolipid metabolism with respect to mitochondrial and vacuolar structure in conjunction with the reproductive response of nitrogen starvation in Saccharomyces cerevisiae. By use of fluorescence microscopy coupled with viability assays of different mutant strains of S. cerevisiae, we find a direct correlation between the sphingolipid accumulation and the sphingolipid species being accumulated. This discovery paves a path for the development of treatments of human diseases using yeast as a model organism.

Battle of the Bands Fundraiser for the Hope From Haley Hughes Foundation

---

Christopher Lawson Page
Julie Meadows, Ph.D.
Department of Religion and Philosophy

I am organizing a school event where students can use their musical abilities and compete in a battle of the bands. All ticket sales will be donated to the Hope From Haley Hughes foundation.

Defining and Contextualizing American Law Enforcement's Antagonism Directed Towards Queer Communities in the 1960s

Natalia Marie Papotto
William J. Harris, Ph.D.
Department of History

By the 1960s, negative social perceptions about queer people were motivated primarily by public fear and the threat of a moral panic. Because of this, American law enforcement agencies were publicly sanctioned in their administration of a campaign of antagonism. When the Civil Rights Movement gained momentum, queer communities were excluded because of the unique characterization of queer identification as an issue of immortality rather than a human right. The contextualization of the Stonewall Riots of 1969 as one of the many examples of unprovoked police violence directed towards queer communities helps to establish a pattern of intentionally anti-gay policies and procedures by US law enforcement agencies.

The Generational Effects of the Holocaust on German Society

Brianna Nichole Parnell
Stefan Wiecki, Ph.D.
Department of History

The aftermath of the Holocaust had many different aspects that affected German society. Specifically in West Germany that political changes focused on the prevention of a political party like the Nazi Party from taking over again. From 1945-1968 there were public programs to rebuild the lives of German citizens, however, the issue of the Holocaust was a matter that was not readily discussed. In West Germany, there was very little focus and accountability for the Holocaust and its effects on research in that area. It wasn't until 1968-1972 that acceptance and discussion of the Holocaust began. There was a further complication of reconciliation in Germany with the division of Germany between the Federal Republic of Germany in the West and the German Democratic Republic in East Germany in 1945. The influences of Western democracies in the West and Soviet Union ideals in the East greatly changed the progress of both sides. The Western Part of Germany after the Holocaust will be the main focus because of notable policies and discussions of the Holocaust. The reconciliation of the Holocaust was not a linear issue. It was a progression of denial, deflection, and finally accepting what occurred. Over time it appears that new generations have different views of the events and are more likely to come forward and talk about the issue. The issues of the Holocaust were not completely solved by 1972, there are still those in German media who associate themselves with Nazis and deniers of the Holocaust. The progression, however, with positive changes that address the damage done through reparations and memorialization outweighs the negative progress of those who don't accept the severity of the Holocaust.

#WEAREPC Music Festival: Clinton Community UNITY

Kennedy Elise Perry
Julie Meadows, Ph.D.
Department of Religion and Philosophy

Presbyterian College NAACP is the local collegiate chapter of the National Association for the Advancement of Colored People. The Chapter was founded in 2020 by Trinity Williams, and since then, PC NAACP has been dedicated to uplifting the PC and Clinton community through integrity, honor, respect, inclusivity, and service. Hence our motto, "While We Live, We Unite!" PC NAACP along with several other student organizations such as the Multicultural Student Union, Student Government Association, Student Activities Board, 112 Musgrove Student Center, Panhellenic Council, and Interfraternity Council will be hosting a community service initiative on April 28th, 2023, from 6:00 – 11:00 p.m. called the #WEAREPC Music Festival.

The community music festival highlights students, local businesses, groups, organizations, and musical and artistic talent in the PC and Clinton communities. It aims to bridge the gap between PC students and the Clinton community. Our organizations are dedicated to building community, fellowship, advocacy, and awareness amongst the PC community and beyond. The mission of the Presbyterian College NAACP, as a non-profit, student-led organization, is to develop leaders to take action within their communities and to build on the values of integrity, respect, and service. The goal is to unify students and the Clinton community by celebrating students and local community leaders and members through advocacy and awareness. Together we can ensure that our actions meet our aspirations as a community and beyond.

The Effects of Big Data on the Real Estate Market

Willie James Pontoon III
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

If there are real estate entities that have already started using big data, then that information is not publicly available. This is because almost all businesses in real estate already use data analytics to the extent of projecting demand and prices for property. Since this current data serves them so well they see no need to make further investments in big data solutions. However, there is a problem in the real estate industry when it comes to the accuracy of property estimate values. My project will explore the applications of big data in the real estate market. The research questions are: (1) What are the benefits and advantages of utilizing big data in the real estate market, include how the industry applies ML and AI? (2) What are the trends in the application of big data in the real estate market? (3) What are the challenges in applying big data in the real estate market? (4) What are the methods and processes of applying big data in appraisal of assets in the real estate market? This study will use quantitative and qualitative methodology.

Subjective Well-Being and Existential Themes Among Adults 65+

Elaine Isabella Powers
Drew Brandel, Ph.D.
Department of Psychology

The present study investigates subjective well-being and existential experiences (e.g., reflections of meaning and purpose) among older adults above the age of 65 within the local community. Previous research related to life satisfaction indicates that rates of well-being among older adults are relatively higher compared to other age groups. However, older adults above the age of 65 experience steeper declines in well-being due to the unique challenges related to aging, such as a higher chance of experiencing widowhood, a decline in physical health, and drastic life changes such as retirement. In this research, we qualitatively assess existential experiences that may relate to perception of well-being for older adults through an in-person, semi-structured interview with each participant. The questions for the interviews have been developed through the framework of Yalom's (2002) Givens of Existence and are inspired by previously validated scales. The aim of our research is to investigate the potential relationship between existential experiences and subjective well-being among older adults above the age of 65 through a strengths-based, positive psychology approach.

Black Women in the Civil Rights Movement

Maya Nicole Reyes
William J. Harris, Ph.D.
Department of History

My research of this topic will ask the question: given their importance, why are black women not central to our understanding of the Civil Rights Movement? In addition, we must ask what impact the absence of Black women from the narratives of the Civil Rights Movement has had on our understanding of the Movement. It will emphasize the point that it was not an accident of history, but their absence from the historical record and the telling of history is a consequence of the structure of society. The outcome of the research will also demonstrate the impact of their absence.

The 1960s Hippie Movement and its Effects on Counterculture

Hallie M. Ridings
William J. Harris, Ph.D.
Department of History

My research focuses on the infamous Hippie Movement of the 1960s, and how it played a role in counterculture during this time. It defines what the Hippie Movement was, and how it affected society during this time. In the height of war and chaos, America looked to the pleasures of free love, drug use, and music to soothe their angst, as well as anger, towards the government and the ever-changing decade that was the 1960s. How did the Hippie Movement start, and why would it become such a huge component of 1960s counterculture?

Teachers' Perceptions of the Importance of Creating a Positive Classroom Environment

Gracen Elizabeth Sharp
Tammy J. Graham, Ed.D.
Department of Education

The purpose of this study was to investigate teachers' perceptions regarding the importance of creating a positive classroom environment and how it aids students' motivation within the classroom. A survey that provided elementary teachers the opportunity to indicate how strongly they agreed or disagreed with the importance of multiple factors related to classroom management and student-teacher relationships was posted on a variety of social media platforms. By ranking the factors, current elementary teachers highlighted the importance of creating a positive classroom climate and what one should do in creating such a climate. The data was disaggregated by year of experience and analyzed for themes that addressed the barriers and benefits to connecting with students in a positive manner, examples and advice in creating a positive classroom environment, and the importance of teacher-student relationships. Based on the findings of the research, a list of strategies is provided to assist current and future teachers with creating a positive classroom climate.

The Angles of the Event: How the Unconventional Texts of *Extremely Loud and Incredibly Close* and *In the Shadow of No Towers* Shift the Meaning and Understanding of the Events of 9/11

Sarah Elizabeth Smathers
Terry Barr, Ph.D.
Department of English

This essay explores the subjectivity of 9/11 through the fictional work *Extremely Loud and Incredibly Close* by Jonathon Safran Foer, and the personal graphic memoir *In the Shadow of No Towers* from author Art Spiegelman, particularly emphasizing the individual and collective trauma that stems from the nature of loss. Through these works, we can better understand how the love and hate binary that normally guides understanding in both reporting and historical accounts of an epic, traumatic event is suspended, and better see how our understanding is then shifted to recognize a new understanding of that event – the arguably more accurate binary of love and loss. This research incorporates ideas from deconstructive, psychoanalytic, and trauma theories in addition to a review of literary criticism to argue the value of a fictional narrative approach to the events of 9/11. Thus, this research seeks to answer the central question of how the unconventional texts of *Extremely Loud and Incredibly Close* and *In the Shadow of No Towers* shift the meaning and understanding of 9/11 from the notion of love and hate to that of love and loss. Moreover, the function of loss is understood to be a driving force of both art forms and is thematically central and relevant to understanding these works.

Investigating the Narcissism Subtypes and their Parasocial Relationships with Fictional TV Characters

Sarah Elizabeth Smathers
Stephanie D. Fries, Ph.D.
Department of Psychology

This exploratory study aimed to better understand links between the narcissism subtypes and parasocial relationships. Parasocial relationships (PSRs) are repeated interactions between a viewer and media persona whom the viewer will never meet. PSRs may compensate for social relationships; people are motivated to form PSRs for reasons such as belonging, attraction, guidance, and more (Greenwood, 2018; Derrick et al., 2008). Since narcissists are notorious for being absorbed in their self-importance and callous in their real-life relationships, how and why they form PSRs is unclear, especially across the different narcissistic subtypes. Individuals high in agentic grandiose narcissism (AGN) are extroverted, entitled, and self-enhance in intelligence, dominance, and attractiveness. AGN and PSRs have been limitedly studied, but PSR research in communal grandiose narcissism (CGN) and vulnerable narcissism (VN) is largely absent. CGN are also extroverted and entitled but self-enhance in team membership and helpfulness. VN are entitled but neurotic and characterized by negative feelings of inadequacy. Using insights from narcissism literature on consumer culture as well as celebrity interest (e.g., Ashe et al., 2005; Lee et al., 2013), we focused on studying narcissists' PSRs with fictional television series characters.

We administered a survey via the Prolific platform to investigate how and why the narcissistic subtypes may hold a PSR. Participants (n = 303) named their favorite fictional character and rated their perceptions of the character and motivations for their PSR. Existing scales measured narcissistic subtypes (i.e., NPI, CNS, HSNS).

We found no significant differences in the type of fictional character chosen by the narcissistic subtypes; however, motivations for having a PSR differed. Specifically, we found that those high in AGN felt their self-views

aligned with their favorite character, which gave them a sense of belonging. They watched their favorite character to gain guidance in their own life and were motivated to maintain a PSR for the attention/admiration it would bring to themselves (all r's≥.12, all p's<.05). Those high in CGN viewed their favorite character as popular and unique; like AGN, they also felt similar to their character with regard to their life experiences, which gave a sense of belonging. They also watched their favorite character to gain guidance in their own life and gain attention/admiration of others (all r's≥.12, all p's<.05). Finally, those high in VN did not identify with their favorite character; instead, their character helped them escape their own reality and engage in grandiose fantasies. This provided a sense of belonging but invoked prevention focused emotions of anxiety and rumination about potential loss of character (all r's≥.12, all p's<.05).

This study clarifies the motivations behind narcissists' parasocial relationships. Participants high in AGN and CGN seemed to use PSRs to boost their ego while those high in VN sought fantasy and an ideal self. These results provide more information on how individuals higher in narcissism may be fulfilling their needs and what function PSRs have in narcissists' lives. Future research can investigate if getting one's needs met through PSRs impacts how narcissists behave in real-world relationships.

Cost Analysis of Vancomycin as Compared to Dalbavancin for the Treatment of Severe Skin and Soft Tissue Infection or Osteomyelitis in High-Risk Patients

Thomas Southerland
Ryan Sangiovanni, Pharm.D.
Pharmacy School

Vancomycin has been the mainstay therapy for treating some resistant osteomyelitis and skin and soft tissue infections (SSTI). Although vancomycin is relatively cheap and effective, it is not without issue. Patients receiving vancomycin may need to have a prolonged hospital stay to receive intravenous (IV) therapy and are subjected to a longer duration of treatment which may translate to adverse events or poor outcomes associated with an extended hospital stay. This is more of a concern with our patients we do not want to discharge with an IV line, such as IV drug users (IVDU) and homeless patients. These patients are considered high risk for the fear of them not returning to the facility to continue and finish their therapy and the safety concerns with sending an IVDU or homeless patient out with an open port. These high-risk patients may benefit from the pharmacokinetic profile of a medication like dalbavancin. Dalbavancin is a lipoglycopeptide antibiotic, with a much longer half-life than vancomycin. Dalbavancin can stay at therapeutic levels for around 1 to 2 weeks' time and greatly shorten hospitalization length. Dalbavancin has an expensive upfront cost and evidence analyzing the upfront cost as compared to overall hospitalization or rehospitalization has not been well established. The objective of this retrospective cohort study is to examine dalbavancin as compared to vancomycin in IVDU or homeless patients in regard to cost and rehospitalization.

How Basic Programming Concepts are Crucial in K-12 Learning

Abigail Ann Sparkman
Olivia Mambo Nche, Ph.D.
Department of Computer Science

Every middle school student needs a computer science course, and in high school most need at least two or more classes. Should we require all middle and high school students to take a computer science course? This could be debatable however, this paper argues that such courses need to be at hand for all students. These courses will allow a strong focus on arithmetical thinking and programming which is believed to create a stronger learning within students to better prepare them for future educational courses. By adding in classes like these, we hope to see an impact on student's reasoning skills, analytical skills, and self-efficacy within mathematics.

A Comparison of Pre-Service Educators and Practicing Certified Teachers' Opinions on the Importance of Professional Dispositions

Stephanie Elizabeth Squires
Tammy J. Graham, Ed.D.
Department of Education

The purpose of this study was to investigate the difference between pre-service educators and practicing certified teachers' opinions on the importance of professional dispositions in the career. A survey was conducted via email to three higher educational institutions and the largest elementary school in close proximity to those institutions. The survey provided participants an opportunity to indicate how strongly they agreed or disagreed with specific dispositions being displayed consistently in their profession. The data was disaggregated by classification in school (pre-service) and years of experience (in-service) and analyzed for common themes. Based on the study's results, a list of recommendations for enhancing how professional dispositions are addressed in college education programs will be provided.

Graph Theory and Natural Language

Hayley Alice Steves
Kara L. Shavo, Ph.D.
Department of Mathematics

Natural language is a complex system that is difficult to model. Scale-free networks (including hub-and-spoke models) have been used to model semantic networks of natural language. While this model has mainly been used while exploring individuals' acquisition and navigation of language, this model should also hold true within a larger society that uses the same language. This idea can be used to analyze how internet trolls use social media to reach the largest audience possible. Social media is a huge part of how stories both truthful and fictional spread around the world, and trolls take advantage of that. In a previous study, internet troll tweets were analyzed using mainly statistics, and it was discovered that troll tweets, in comparison to genuine tweets from political leaders, repeated fewer words, but repeated those words more often. Looking at this phenomenon through the lens of graph theory, it can be said that trolls used these repeated words as hubs, while placing these words in many different contexts (among many different 'spokes') to attract more readers. By taking advantage of this scale-free model of language, trolls are able to reach the largest readership possible and thus able to spread the ideas and opinions that they would like to perpetuate.

The Effect of Cell Phone Notifications at Different Levels of Processing on Memory

Brandon John Stiff
Sarah Burns, Ph.D.
Department of Psychology

Memory is a process that involves the acquiring, encoding, storing, and retrieving of information obtained from the environment. According to the levels of processing theory, proposed by Craik and Lockhart, the perception of stimuli requires analysis at various cognitive levels (1972). Processing things at greater "depth" involves more cognitive analysis and making connections with already known material. This deeper analysis is associated with longer retention and better performance on memory recall tasks (Craik & Lockhart, 1972).

To process the presence of a stimulus, you must first attend to it. According to Mulligan, divided attention results in worse performance on semantic memory recall tasks (1998). This is likely due to the load theory of attention; this theory states that processing capacity, how much information input a person can handle at one time, is limited (Lavie, 2004). The perceptual load, the difficulty of a given task, varies between different actions; high-load tasks, such as reading, use up more cognitive resources than low-load tasks, thereby they use more processing capacity (Lavie, 2004; Stothart et al., 2015). Overall, dividing attention between multiple stimuli prevents individuals from fully focusing on and processing the "to-be-remembered" information, which can be especially harmful in an academic setting.

Unfortunately, distractions in the academic environment are nearly impossible to avoid on college campuses with the accessibility of cell phones. A study by Dietz and Henrich concluded that texting during class resulted in significantly worse performance on semantic memory recall and recognition tasks (2014). What many students fail to realize is that these notifications cause distractions far after the *bing* noise stops; cell phone notifications promote task-irrelevant thoughts and prevent students from

focusing on the material. Even when students ignored the notification, their performance on semantic memory recall tasks decreased (Stothart et al., 2015).

This experiment will test the effect of cell phone notifications at different levels of cognitive processing (deep vs. shallow) on semantic memory recall and recognition. After the level of processing task is complete, a memory recall and recognition task will be given to assess how much the presence (or lack thereof) of a cell phone notification disrupted processing. It is hypothesized that the presence of notifications in both shallow and deep processing will decrease memory performance. However, the presence of notifications during deep processing should have a greater decrease due to the high perceptual load this task requires, which will be interrupted by the cell phone notification.

MLB Payroll Efficiency

Benjamin Loftis Stone
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

Major League Baseball (MLB) has differentiated itself from the other two major American sports league (National Basketball Association and the National Football League) by designing the player salary system so that there is no official salary cap that a team can't go past to spend on players. However, not all 30 Major League teams are built equally and the payrolls vary widely among the teams. The MLB allows the big market teams to remain dominant through investing as much money as they want into talent while many small market teams are allowed to consistently spend significantly less while they bring in enough money to easily clear their bottom line due to their low investment in talent. Data gathered through Baseball Reference and Spotrac are combined to perform statistical analyses and examine the trends throughout the MLB teams. Through data visualizations in Tableau and explanations of the way in which MLB operates, this paper examines how and why money is invested in talent and what this typically results in in regards to attendance, wins, and playoff success.

Following Fantasy: How has the Genre Evolved from British Plays to Contemporary Novels?

Sophie Catherine Sullinger
Lynne M. Simpson, Ph.D.
Department of English

The purpose of this research is to study the evolution of the fantasy genre by comparing common elements of supernatural groups in both Renaissance English plays and contemporary novels. The two supernatural groups that I am studying are magicians and witches, both of which are magic-wielding figures who are well-known by contemporary society. The Renaissance plays *Doctor Faustus* by Christopher Marlowe and *The Tempest* by William Shakespeare as well as Erin Morgenstern's contemporary novel *The Night Circu*s provide excellent examples of magi characters. These magicians' clothing and tools, particularly their books, their use of training to hone their skills, and their abilities– which consist of control over both inanimate and animate objects and the power of invisibility– remain a stable core element of their identity throughout the centuries. Next, Shakespeare's *Macbeth*, Leigh Bardugo's *Six of Crows*, and Sabaa Tahir's *An Ember in the Ashes* all contain witch-like figures, though the novels identify these characters with other names. While appearances of these witch-figures vary from normal features to alien or ghost-like, their vanishing abilities, powers of prophecy, and healing skills identify the three groups as witches. Throughout the research, I explore the evolution and relevance of these magic and witches both in the literature itself and in society's views and opinions of them and reconsider the definition of fantasy as a genre.

Formation and Function of Parasocial Relationships Among Narcissistic Individuals

Sophie Catherine Sullinger
Stephanie D. Fries, Ph.D.
Department of Psychology

People can form connections with characters they have never met and will never meet, which are called parasocial relationships (PSR). Little research investigates people high in narcissism and their parasocial relationships to fictional characters. Narcissism is an entitled need for distinctiveness with goals and attributes viewed as more important than others (Gerstorf et al., 2010). The narcissistic subtypes, including agentic grandiose narcissism (AGN), communal grandiose narcissism (CGN), and vulnerable narcissism (VN), differentially seek a sense of specialness through their individual traits, status in a group, or perceptions of unfair disadvantage. This study hopes to find out more about the motivations narcissists have when forming PSRs, such as whether they have PSRs with characters they identify with or wish to emulate. We also want to study how PSRs function in narcissists' lives, specifically whether or not a public or private PSR interaction (versus control condition) can satiate narcissists' needs compared to individuals low in narcissism (e.g., need for attention, belonging, grandiose fantasy).

Based on Smathers & Freis (2022), we predict individuals high in AGN and CGN will identify with their favorite fictional character. A public interaction will satiate AGN and CGN's needs for attention but may increase their state narcissism levels. The private versus control conditions will likely not differ for either AGN or CGN. We predict individuals high in VN will not identify with their favorite fictional character but wish to emulate them. A private interaction will satiate VN's need for grandiose fantasy but may also increase their state narcissism levels. We will explore how the public and control condition will affect VN.

We administered a 15-30 minute online survey to college students who received course credit for their participation. We recruited about 272 participants.

Participants stated their favorite fictional character and then rated their identification with the character and perceptions of the character's personality traits. They then were randomly assigned to one of three conditions: to publicly write about their PSR, privately write about their PSR, or write about an unrelated topic (control condition). After manipulation checks, participants completed self-report questionnaires that measured their state narcissism levels and state PSR motivations. Lastly, existing scales (i.e., NPI, CNS, HSNS) measured trait narcissism for the different subtypes.

We will first run correlations to test if the narcissistic subtypes differentially identify with their character or choose characters with specific personality traits. We will then run multiple-regression analyses to test whether condition and narcissism level interact to predict changes to state narcissism levels or state PSR motivations.

We expect to find differences between the narcissistic subtypes (AGN, CGN, and VN) and those low in narcissism with respect to the formation and function of their PSR. If supported, the results from this study can better inform theory behind the narcissistic subtypes' motivations as well as suggest potential interventions to satiate narcissists' needs.

The Effects of DNA Coating on the Cytotoxicity of CdS Nanoparticles

Lily Rachael Taylor
Latha A. Gearheart, Ph.D.
Department of Chemistry and Biochemistry

In recent years, there have been many advances in the study of nanoparticles, which are materials with a size no larger than 100 nm. Nanoparticles have several unique physical and chemical properties that allow them to have a wide range of capabilities, including use in biomedical settings such as targeted chemotherapy. A subset of nanoparticles called quantum dots are specifically useful for their emission capabilities. These quantum dots are often, however, cytotoxic, including cadmium sulfide (CdS) quantum dots. The goal of this study is to test the hypothesis that the binding of kinked DNA to the surface of the CdS quantum dots will decrease their cytotoxicity. To do this, CdS nanoparticles were synthesized by methods of standard precipitation. The nanoparticles were then characterized using fluorescence spectroscopy and Ultraviolet-visible spectroscopy. Kinked DNA was then bound to the surface of the quantum dots. Lastly, life and death assays were conducted using yeast to determine the cytotoxicity of CdS quantum dots when they were both coated and not coated in kinked DNA.

Global Effects of COVID-19 on the Stock Market

David Isaiah Thompson
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

I am looking into the effects of COVID-19 on markets around the world. The pandemic has had negative effects on many aspects of our world. Stock markets are a major part of the modern world and often get affected by outside factors. I will be focusing on COVID-19 as a factor to see if it had a negative effect on stock markets globally. I have data from 63 stock markets globally around the time of the pandemic. I will study the before, during, and after effects of COVID using an event study approach. Seeing if the pandemic did in fact have an effect on the market would show to us why it is important to contain such outbreaks more efficiently in the future. Based on the results from the data gathered, I expect to confirm my suspicions that COVID-19 does have a negative effect on stock markets.

Using Unity to Design a 3D Game

Trent Chance Thompson
Olivia Mambo Nche, Ph.D.
Department of Computer Science

Unity is one of many game engines that are used to create video games. I have decided to use Unity to make is a 3D platform game with two sections: a hub world and one level. The hub world serves as an area where the player can freely move around in and select which level they wish to play, while the level will play similar to an obstacle course. To beat the level, the player will have to reach the end while navigating through various obstacles, such as fallen pillars and bottomless pits. If the player falls into a pit, then they will lose some of their health and falling into a pit too many times will cause them to fail the level. This game is meant to challenge the player and test them to see if they can reach the end. I will also explain my thoughts and perspective on designing a game for the first time.

Soft Robotic Prosthetics Utilizing Granular Materials

Marigordon R. Varner
Eli Thomas Owens, Ph.D.
Department of Physics

As technological advancements continue to be incorporated into prosthetics, there is a gap that is created by the quality/cost ratio associated with using technologically advanced prosthetics. Many open-sourced prosthetics are relatively inexpensive prosthetics but sacrifice the ability to grip unique shapes. Prior work in the field has successfully used compressed air and a small granular material to build a gripper that can hold various objects. The use of compressed air makes these devices relatively slow and limits the applicability of this design. Our goal is to explore the use of magnetic granular materials and an external magnetic field to induce the jamming of the material. The granular material is inside flexible membranes wherein it can go from a more relaxed state to the more rigid state depending on the state of the magnetic field. The flexible membrane also allows the object to be held while the solenoid is on, and then released when the solenoid is off. Iron filings work well as our granular material as they use the solenoid to conform to the unique shape. This when combined with the myoelectric effect, the electrical signals sent through the muscles, allows the magnetic field to be turned off and on. This design furthers our pursuit of creating of a low-cost but high functioning upper prosthetic.

Reexamination of Too Tired to Think: Within and Between-Person Relations Among Impulsive Traits, Sleep Duration, and Mental Health Outcomes

Mickey Charles Walker III
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

Mental health is a major crisis facing the world today, and things that are considered to be a large influence on this are inherent impulsive traits in a person as well as their quality of sleep. The study I aim to replicate asked the question: Does a lack of sleep and inherent compulsive traits play a role in heightening the risk of depression and heavy drinking? To answer this, they derived data from a small subset of questions from a series of surveys given to the same individuals, starting in middle school and highschool, and continued with a similar survey every 5 years, over the course of roughly 30 years. The analytical methods I plan to replicate include within and between person theoretical models that indicate the risk level associated with impulsivity is heightened whenever a lack of sleep is present. If this is the case, targeting and focusing on intervention based on impulsive traits as well as evident lack of sleep could help many people.

Acute Effects of Video-game Playing Versus Television Viewing on Stress Markers and Food Intake in Overweight and Obese Young Men

Jordyn Perry Wall
Rachel G. Childers, Ph.D.
Department of Economics and Business Administration

The purpose of this research is to explore whether behavioral stresses alter sensations of appetite and eating behavior. Examination of television watching and video game playing was used to explore different eating patterns, associated with differential levels of stress responses. In a randomized controlled trial, 72 overweight/obese adult males were assigned to three different groups: non-violent television, non-violent game, and violent game. After an hour, drinks and snacks will be provided along with a 25 minute break. Stress markers were measured throughout the trial. Studies show that playing video games in overweight/obese adult males is associated with an acute stress response relative to watching non-violent television, associated with greater subsequent food intake. These findings highlight the need to focus on the metabolic effects, as well as the energy costs, of activities involving sitting in relation to obesity risk.

Reconciling Faith and Reproductive Rights

Ava Louise Ward
Julie Meadows, Ph.D.
Department of Religion and Philosophy

With the recent court's decision to overturn *Roe v. Wade*, I have found myself in somewhat of a personal, moral dilemma. I am a feminist who believes that every woman deserves the right of autonomy over their own body, and that having access to safe abortions has allowed women to have the control to which women are entitled. However, the overturning of the court decision that protected this right is an assault against women. My religion has supported this decision which has led me to question my faith. How could I be a part of a community that does not see my rights as a woman as valid? My presentation of my research is an argument to my religion as to why they should support women under all circumstances. My method of research was to find women who are in the same dilemma and hear how they are living their lives and reconciling their faith. I was fortunate enough to find so many women struggling with the same issues as me and have read their stories which allowed me to feel more confident in my faith and my beliefs as a woman.

Caribbean Women Writing the Law: Representations of Double-Colonization in *Wide Sargasso Sea* and *Prospero's Daughter*

Madison Ann Watkins
Emily Taylor, Ph.D.
Department of English

Postcolonial literature is essential to understanding the experiences of oppressed groups under colonization. These texts often include representations of the legal systems enacted by colonial powers, and analyzing the connections between literature and its portrayal of the law offers a more complete view of the effects of colonization. This technique can be used to see how colonial law specifically impacts women in English colonies in the Caribbean and is applied to two novels: *Wide Sargasso Sea* and *Prospero's Daughter*, both of which are written by Caribbean women. The major characters in these texts are each representative of different places on a hierarchy, allowing for a microscopic view of the power structures enacted by colonizers. Focusing on the legal aspects of these dynamics reveals how colonial law acts as a catalyst for double-colonization: a phenomenon in which colonized women undergo oppression from both the colonial power and patriarchal society.

Effects of Dietary Iron on Taxonomic Composition and Function of the Zebrafish Gut Microbiome with Spectroscopical Metabolomic and Lipidomic Analysis

Megan Danielle Whisonant
Stuart Gordon, Ph.D.
Department of Biology

A healthy gut microbiota is essential to promote host health and well-being; therefore, effects of dietary components on the gut microbiome are important to investigate as the gastrointestinal tract can be a major route of infection. Iron – an essential component of heme and iron-sulfur proteins – plays a central role in many biological activities, including oxygen transport and cellular respiration. In particular, the iron homeostasis system is one of the best characterized due to iron′s causative relationship with iron-deficiency anemia. Dietary iron supplementation is a commonly used treatment for iron deficiency anemia; however, the known direct impacts of iron on the gut microbiome functional potential remain limited. In the present study, using Zebrafish (Danio rerio) as a model organism, we sought to determine if increases in dietary iron would cause changes in taxonomic composition and gut microbiome function. Based on our analysis, an increase in dietary iron significantly altered the zebrafish microbiome taxonomic composition with specific increases in Firmicutes and Proteobacteria. Analysis of taxa for functional potential suggested that iron enriches physiological functions such as aerobic respiration. These results will be further explored through a metabolomic and lipidomic analysis.

IL32 expression contributes to a cell stress response and ECM-remodeling expression signature in breast cancer stem cells

Megan A. Wilson
Austin Young Shull, Ph.D.
Department of Biology

Basal-like breast cancers typically correspond with increased enrichment of cancer stem cells (CSC) and propensity toward metastasis and migration. However, the molecular mechanisms underlying these general characteristics is not well understood. A prior 450k DNA methylation profile comparing CSC-poor cell lines to that of CSC-enriched breast cell lines alluded to hypomethylation in the IL32 promoter. The correlation with both the hypomethylation and increased differential expression of IL32 beta in breast CSC-rich cell lines has resulted in the canonical interleukin to be of keen interest. We sought to determine the effects of suppressing IL32 in CSC-rich cell lines by performing an siRNA-mediated transfection targeting IL32, RNAseq differential expression analysis as well as a multi-pathway phosphorylation protein array that evaluated the MAPK, AKT, JAK/STAT, TGFB, and NFKB pathways. From our RNAseq results, we determined that there was notable enrichment in siIL32 treated CSC-enriched cells of upregulated pathways involved in extracellular matrix (ECM) organization as well as enrichment of downregulated pathways involved in cellular and replicative stress responses. Furthermore, IL32 suppression decreased cell invasion in both an ECM-matrix cell invasion assay and a chick CAM xenograft/angiogenesis model. Furthermore, our RNAseq results corresponded with our protein phosphorylation array where we observed a decrease in phospho-JNK and phospho-NFKB in siL32-treated cells, both of which are well-established events that can coordinate both cell stress responses and cellular invasion. Collectively, our results reflect the notion that differential IL32 expression by promoter hypomethylation in breast CSCs plays a role in mitigating intracellular stress and subsequently promoting breast cancer cell invasion.

Easter Cookie Decorating

Natsuki Yokoyama
Julie Meadows, Ph.D.
Department of Religion and Philosophy

This presentation is about the event which is my project for the Building Community Class, which is aimed at giving the opportunity for students to communicate with others. It also offers opportunities for exchange students to experience new kinds of religious communities.