WCU
WEST CHESTER UNIVERSITY

Research & Creative Activity Day
Abstract Booklet
April 17, 2024

Office of Research and Sponsored Programs

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Welcome!

We are excited to showcase our annual Research and Creative Activity Day at West Chester University where we highlight the innovative and impactful research being conducted by our outstanding faculty and students. This year we have an unprecedented number of presenters, with nearly 150 faculty and students sharing through poster presentations, oral presentations, and new to this year, faculty panels. Your interest and support are greatly appreciated as we celebrate the dedication and hard work of our researchers. Thank you for joining us in this celebration of knowledge and discovery.

Sincerely,
Dr. Cheryl Neale-McFall
Associate Provost for Research and Creative Activity
West Chester University

Because West Chester University seeks to be a leader in local, regional, and global sustainability efforts, the Office of Research and Sponsored programs has collaborated with the Office of Sustainability to create a special designation for those Research and Creative Activity Day projects that perpetuate the health and welfare of people, economies, and the environment. Thus, all abstracts identified with *the Brandywine B* reveal the many ways that West Chester University faculty and students are helping to design, implement, evaluate, and improve a variety of environmental, social, and economic sustainability activities.

The Office of Research and Sponsored Programs sponsors an annual Summer Undergraduate Research Institute (SURI) where undergraduate scholars hone critical and analytic thinking skills to prepare for graduate-level studies or careers. SURI scholars work full time under the direct supervision of a faculty mentor for 5 weeks to complete a research project or creative activity. All abstracts identified with the SURI logo reflect SURI projects completed in summer 2022.

The Committee for Excellence in Learning and Teaching (CELT) is one of the subcommittees under TLAC that helps faculty identify engaging and innovative ways to improve their teaching practices resulting in improved student learning. Each year CELT has an open call for projects that support cutting edge practices to encourage the implementation of new and innovative projects that would not be possible without this financial support.

The purpose of the SRCA is to recognize outstanding graduate and undergraduate students who have completed original research or creative projects in collaboration with a faculty mentor. SRCA awards are presented to students who have conducted independent work that is original and substantive, given the standards and objectives of their field. Below, you will see the SRCA logo next to the outstanding student projects that were awarded this year.

Student Undergraduate Research Foundation (SURF) is a research and creative activities opportunity for undergraduate students to collaborate with faculty mentors during the Spring semester to promote critical thinking and prepare students for a greater understanding of research and creative activity methods and outcomes. Selected students are provided with a stipend to collaborate alongside their faculty mentor for an opportunity to gain valuable hands-on learning outside of the classroom.

ORAL PRESENTATION ABSTRACTS

Shakespeare's Original Practices: Why would you do that?
Presenter: Professor John Bellomo
Department: Theatre & Dance

Why produce Shakespeare's plays using Original Practices techniques? Theatre companies around the English-speaking world increasingly utilize Original Practices. Many of these theatre companies claim that this approach gives the actors greater access to the text, making the words and stories come alive in a way that cannot be achieved through a modern rehearsal process. They claim that through Original Practices, the plays are explored "with" the audience, which implies that in modern theatre practices, the play is performed "at" the audience. By removing the modern conventions of sets, lights, and costumes they can get to the heart and soul of Shakespeare's works that no other approach can accomplish, creating a more enjoyable and accessible experience. Are theatre companies exploring Original Practices techniques simply for historical purposes or are there lessons to be learned that are useful to the modern theatre artist? Is there a way to meld the old and the new approaches to theatre to create the exciting and vibrant productions of Shakespeare's plays that we all want? Drawing from my experiences as the former Artistic Director of the Maryland Shakespeare Festival, a Shakespeare Company dedicated to exploring his works through Original Practices, my current work as a university professor, and interviews with actors and directors versed in Original Practices, I will attempt to answer these questions. This presentation was originally presented at the 2023 IUGTE Conference in Ragnitz, Austria.

Where are We? Who are We? Museums as Springboards to Dialogue
Presenter: Abigail Boquist
Faculty Mentors: Dr. Pauline Schmidt, Dr. Matthew Kruger-Ross
Departments: Secondary Education and K-12 Physical Education,
Educational Leadership and Higher Education Administration

A look at a modern suburban school classroom will provide the rationale needed to understand the importance of this work. Teachers across the country teach students of all races, ethnicities, and belief systems, students who speak multiple languages and who were raised outside of the United States, students who are members of the LGBTQ community, students with physical and mental disabilities, students from range of socioeconomic statuses, and students from adoptive and single-parent households. Every child comes from a unique sociocultural context which affects their approach to learning. Educators must acknowledge and cater to the diversity in their own classrooms and learn from students whose backgrounds may be unfamiliar to them.

Antimicrobial Efficacy of Zinc Oxide Nanoparticles on Pseudomonas aeruginosa and Staphylococcus aureus ESKAPE Pathogen Cocultures
Presenter: Jessica Buchser
Faculty Mentor: Dr. John Pisciotta
Department: Biology

The antimicrobial properties of metal-containing nanoparticles are well studied, yet their interactions with multidrug resistant ESKAPE pathogen cocultures have not been characterized. The ESKAPE pathogens (Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa, and Enterobacter spp.) are key drivers of multidrug resistance and are the leading cause of healthcare-associated mortality. P. aeruginosa and S. aureus co-colonize the cystic fibrosis airway, where the lung environment provides an optimal environment for growth of polymicrobial biofilms. Current antibiotic treatments are limited by drug resistance of polymicrobial P. aeruginosa and S. aureus biofilms. We hypothesized that exposure of nascent cocultured biofilms to ZnO nanoparticles could disrupt the relationship between P. aeruginosa and S. aureus, reducing biofilm viability. Using quantitative plate counts and scanning electron microscopy, we observed the inhibitory effects of ZnO nanoparticles on P. aeruginosa and S. aureus grown axenically and in coculture. Following exposure to 1 mg/mL of ZnO nanoparticles for one hour, 96% growth inhibition of monocultured S. aureus and 94% inhibition of cocultured S. aureus was observed. By contrast, a significantly higher 89% growth inhibition of ZnO treated P. aeruginosa in cocultures was observed compared to 47% inhibition of P. aeruginosa in ZnO treated monoculture ($p < 0.005$). Scanning electron microscopy revealed mechanical damage to bacterial envelopes and the biofilm matrix compared to untreated controls. This study underscores the antimicrobial potential of ZnO nanoparticles against drug-resistant polymicrobial infections and suggests increased susceptibility of P. aeruginosa to ZnO nanoparticles during initial biofilm development in coculture with S. aureus.

Possible Mechanism for Energy Recovery from the Peduncle Tendons of Harbor Porpoise (Phocoena phocoena)
Presenter: Alexa Cesari
Faculty Mentor: Dr. Frank Fish
Department: Biology

Harbor porpoises (Phocoena phocoena) swim via vertical movements of the tail. The tendons located in the caudal peduncle are attached to the caudal vertebrae to generate propulsive oscillations. For an efficient swimming stroke, it would be beneficial to recycle energy through elastic mechanisms. Previous research has indicated that the tendons were incapable of elastic energy storage. The composition and structure of the tendons, however, suggest a potential mechanism to recycle elastic energy. In this study, the tendon of the caudal peduncle, specifically the extensor caudae medialis (ECM), the extensor caudae lateralis (ECL), and the medial hypaxialis lumborum (MHL) were mechanically tested. Cyclic tests at 2 and 4 Hz were performed on isolated tendon fascicles. Stress relaxation tests to 3% strain were also performed on fascicles. Polarized light microscopy was used to visualize the fibril crimp as tensile forces were applied to fascicles. Uncrimping of isolated fascicles was visualized at mean strain values between 0.3% and 0.48%. The maximum elastic moduli of fascicles taken to failure were within E values of 1039.5-1185.8 MPa. Elastic hysteresis measurements indicated that the caudal peduncle fascicles displayed up to 99% elastic energy recovery at 2 Hz (which represents routine swimming tail beat frequency). The irrecoverable work for fascicles in the MHL was higher than in the ECM and ECL. The mechanical properties of porpoise peduncle fascicles indicate that elastic energy could be stored and recovered, supporting the potential storage of elastic energy to reduce power expenditure during swimming.

North Korean Defectors' Perceptions of Crime and Police
Presenter: Dr. Jaeyong Choi
Department: Criminal Justice

Previous studies have shown that there are several immigrant-specific factors that shape immigrants' perceptions of crime and police (e.g., Correia, 2010; Weitzer, 2014). First, some researchers have found that immigrants evaluate their lives in the host society based on their previous experiences with crime and the criminal justice system in their home country (Sun & Wu, 2018). Second, the social networks that immigrants form in the host society influence their views of crime and police by serving as a source of information for immigrants (Ackah, 2000). Finally, their experiences with crime and the justice system in the host society affect their current perceptions of crime and police (Choi, 2019). Notwithstanding these findings, it remains an open question whether these findings apply to immigrants in a different socio-political setting. Specifically, my research findings will reveal how North Korean defectors' views toward crime and police are shaped by experiences in their home country (i.e., North Korea) and their host society (i.e., South Korea).

The Interactive Read-Aloud: A Case Study on Children with Intellectual Disabilities
Presenter: Professor Christine Cuozzo
Faculty Mentor: Dr. Heather Schugar
Department: Educational Leadership and Higher Education Administration

Interactive read-alouds engage children in active thinking while reading, with the overall purpose of helping them understand that text should make sense (Scanlon et al., 2017). During an interactive read-aloud, adult readers read books aloud to children and include comments and questions before, during, and after reading aloud to initiate conversations. Discussions and transactions with text can also occur spontaneously (Scanlon et al., 2017). A paucity of research exists on how children with intellectual disabilities (ID) experience interactive read-alouds. The purpose of this descriptive case study was to determine how children with ID experience interactive read-alouds delivered by a parent reader. The sample represented in the study was two eight-year-old children with ID and the parent readers. The adult participants each completed a survey, video-recorded a total of four interactive read-aloud sessions and took part in a Zoom interview following the interactive read-aloud sessions to share their perspectives on the read-aloud experiences. Survey information, read-aloud transcripts, and parental interviews were coded using the constant comparative analysis method and themes then developed from the triangulated data. As a result of the uniqueness of each case, the two cases were compared and contrasted with respect to the research questions and sub-questions.

We're All huMAN: A Critical Analysis of Hostile LGBTQ+ Legislation and the Use of Gender-Based Inclusive Language in the K-12 Classroom
Presenter: Connor Dapp
Faculty Mentor: Dr. Dana Morrison
Department: Educational Foundations and Policy Studies

From the root of our existence, people of the United States subconsciously use exclusive language that puts male identifying individuals on an invisible pedestal. "Hu" being an ancient word for God with "man" as its suffix, crafting human, infers that God is a man, or that men are godly. Just the word human immediately counts out anyone who does not identify as a male, suppressing them from the start, even without intent (Weinberg, 2009). Situating this within the wave of LGBTQ hostile legislation in K-12 education, this research will highlight how local, state, or federal policies create an unsafe environment for students on the basis of belonging (Rosky, 2017). This presentation will bring to light words that are exclusive in nature and offer substitutions to such. In using a hopeful future educator's perspective, this literature review challenges teachers and educators at all levels to teach beyond a curriculum that is by the book; instead, encouraging a teaching style that focuses on each individual's need to belong. Through educational advocacy, this presentation challenges you to place meaning behind "y'all means all" and start asking not just yourself, but the entirety of your classes "who's guys?"

Call and Response: Engagement, Mentorship, and Community in Black Doctoral Women
Presenter: Janeane Davis
Faculty Mentor: Dr. Orkideh Mohajeri
Department: Education

This critical interpretivist study considers experiences of Black cis women doctoral students attending Primarily White Institutions across the United States. We interview students enrolled in doctoral programs and explore findings through insights of Endarkened Feminisms (Dillard & Bell, 2011; Okpalaoka & Dillard, 2011). Themes draw on components of spirituality, community, and connection to ancestors.

Air Quality Measurements Near Mushroom Farm Operations in Southeast PA
Presenters: Daniel Engelbrecht, Victor Nwinee, Jess Hampton
Faculty Mentor: Dr. Lorenzo Cena
Department: Health

Introduction: Byproducts of composting and soil production include Ammonia (NH_3), Methane (CH_4), and Hydrogen Sulfide (H_2S). Public concerns arise from exposure to these gases near mushroom farm operations and include pungent rotten-egg odors, metal corrosion, and health concerns.

The CDC recommend a ten-minute ceiling limit for H_2S of 10ppm and 100ppm is immediately dangerous to life or health. The EPA reports the lowest observed adverse effects at 30ppm. Additionally, the Pennsylvania 24-hour standard for H_2S is 0.005ppm.

Research is needed to better understand the concentration of these gases in southeast Pennsylvania communities.
Objectives:
1. Assess environmental concentration of NH_3, CH_4, and H_2S
2. Determine the impact of weather and seasonal patterns on the concentrations

Methods: Outdoor environmental concentrations of NH_3, CH_4, and H_2S, were measured using three real-time area monitors located within 100-600 feet from mushroom soil substrate. Weather and atmospheric conditions were also recorded.

Results: No elevated levels were observed for NH_3 and CH_4. H_2S levels showed irregular concentrations well above the exposure limits and spikes exceeding the 100-ppm upper limit of detection of the instruments. These elevated concentrations were prominent in the fall months and were consistent with wind direction towards the instruments.

Conclusions: H_2S can be smelled at concentrations ranging 0.0005-0.3 ppm. Concerning elevated H_2S levels at or above 100ppm measured in this study are consistent with the metal corrosion complaints reported by residents and comparable to corrosion observable in sewer lines and wastewater treatment plants. The elevated levels pose a serious health concern for the public.

Differentiated Instruction: A Qualitative Study Focusing on the Voices of Elementary Teachers and Their Needs
Presenter: Suzanne Fanelle
Faculty Mentor: Dr. Heather Schugar
Department: Educational Leadership and Higher Education Administration

Research Design: Van Geel et al., (2019) state that differentiated instruction is based on well-considered goals and thorough analyses of students'€™ achievement, progress, and instructional needs, combined with formative assessments and progress monitoring. This qualitative study aims to inform teachers and administrators of their roles as they relate to the implementation of successful differentiated instruction. Elementary classroom teachers are given a voice to outline the many complex components of differentiated instruction and the supports necessary from administration for its inclusion in their pedagogical routine.
Analytic Strategy: Using the combination of a questionnaire and individual interviews to investigate this complicated teaching strategy, a checklist of considerations for administrators to use when planning professional development will be created.
Sample Size: Using demographics data, the researcher narrowed down participants to three teachers from a suburban elementary school in southeastern Pennsylvania. The researcher interviewed selected teachers for a total of 60-90 minutes each over the course of several weeks.
Materials/Central Measures Used: Teachers appropriate for inclusion in the study were determined by their efficacy in providing differentiated instruction. Specified teachers were asked to engage in individual interviews.
Data Analysis: Data was collected, interpreted and coded for themes showing what teachers could benefit from in professional development opportunities to support efforts to provide differentiated instruction for their students.

Examining Pre-service Teachers' Experiences with Different Modes of Case-Based Learning and Perceived Self-Efficacy in Trauma Informed Instruction: A Mixed Methods Study
Presenter: Michelle Fisher
Faculty Mentor: Dr. Heather Schugar
Department: Educational Leadership and Higher Education Administration

This study examined how different modes of case-based learning activities inform the learning experiences of undergraduate pre-service teacher candidates in an introductory special education course. During the COVID-19 pandemic, I assisted university faculty as they rapidly transitioned from teaching face-to-face courses to teaching online courses. One of the most difficult things to transition to an online format was classroom observations/practicum experiences. While there is an increasing amount of classroom video content available, it is difficult to find video observation content related to hard-to-reach populations (e.g., low-incidence disabilities, or students who have experienced trauma). The data from this study included teacher self-efficacy scale survey data at the start of the study and after each of the four case-based learning activities, in-class observations, small group discussion recordings, and one-on-one interviews. The analysis of the results showed that participants (1) preferred the animated cases over the text-based cases, (2) had longer and more in-depth group discussions when they discussed the animated cases, and (3) expressed higher self-efficacy with case-based learning.

A Storm: 8-part men's choral piece for Constellation Men's Choir
Presenter: Everett Frey
Faculty Mentor: Dr. Jacob Cooper
Department: Music Theory, History, and Composition

I was tasked with writing a composition for the 8 voice ensemble Constellation Men's Choir. Using methods in composing, I prepared a score for the group to perform. The group then came to the West Chester University campus to conduct a rehearsal and recording session, in which I collaborated with them closely. My goals in this project were to write a compelling composition for this group and add to the repertoire of men's choral music.

Understanding the Experiences of a First-Grade Class with Explicit Phonics Instruction: A Qualitative Case Study
Presenter: Haley Fry
Faculty Mentor: Dr. Heather Schugar
Department: Educational Leadership and Higher Education Administration

The most effective way to teach reading remains debated in American education (Lemann, 1997; Pearson, 2003; Kim, 2008). Researchers using the term science of reading recently caused a resurgence in this debate. The misunderstanding and overgeneralization of this term, science of reading, led to misconceptions among the education community. Although the science of reading does support explicit phonics instruction, it does not ignore reading instruction beyond phonological awareness and decoding (Shanahan, 2020). The science of reading represents the accumulation of research about reading instruction acquired through the use of the scientific method (Petscher et al., 2020). This misconception guided this research to inquire what is actually happening in the classroom during explicit phonics instruction, grounded in Social Constructivism and the Phases of Word Learning Theory. This qualitative case study examined the experiences of a first-grade class with explicit phonics instruction, which included six students and one teacher. The study focused on how those experiences during explicit phonics instruction transferred to students applying specific skills. Data was collected through classroom observations, a semi-structured narrative interview with the teacher, and task-based narrative interviews with students. Observations and interviews were coded and analyzed for themes using inductive coding to allow authentic experiences to emerge. The research contributed to the literature regarding the first-grade classroom experiences during explicit phonics instruction.

Does belonging to the species matter to the bacterial leaf-cutting ant community?
Presenter: Alexa Gianaris
Faculty Mentor: Dr. Manuela Ramalho
Department: Biology

To understand the evolutionary success of different species, it is important to prioritize the understanding of host-microbe interactions. Unraveling the relationship of the host-microbe interaction is crucial to understanding the evolution of species in their respective environments. Therefore, the present study sought to 1) investigate the associated bacterial communities in four leaf-cutting ant species most frequently found in the southern Neotropics, and 2) compare whether, despite occupying the same ecological niche and being allopatric, belonging to a distinct species is enough to rely on different bacterial communities. Using 16SrRNA amplicon (NGS), the microbiome of different species can be determined, giving headway to potential relationships between species. Leaf Cutter ants present diversity in their native Neotropical region, including four dominant species: Atta sexdens, Atta levigatta, Atta capiguara, and Atta bispheria. Our results revealed unweighted differences among all four species. With further statistical testing, the most prominent difference was found among the microbiome of the Atta laevigatta and Atta sexdens. This study intends to use bioinformatics to further analyze the relationship between the Atta laevigatta and Atta sexdens. Our results are providing an essential closer look at potential advantages and disadvantages between each respective microbiome ant species.

Effects of Religious Exemption Laws on Child Mortality: A Study for the Community "Followers of Christ" in Idaho, United States
Presenter: Dr. Guido Giuntini
Department: Economics and Finance

The presentation discusses research a colleague from Boise State University, and I conducted trying to measure the effects of religious exemption laws on the health outcomes of children. The research uses a mix of demographic techniques and qualitative methods.
Idaho is one of the states in the US that permits parents to forgo medical care for their children due to religious beliefs. On the other hand, a family could be accused of child neglect if it stops providing medical care for any other reason. This study compares age-specific death rates among "The Followers of Christ", a group that rejects medical care, and the general population in the same region to assess the implications of the practice. The comparison is done by using data from the cemetery where the members of the community are interred, and the Dry Creek cemetery in Boise, ID, used by the general population. Because of variations in child mortality rates, the difference is statistically significant. The study is part of an effort to change state laws in order to protect the well-being of children in Idaho, spearheaded by former members of the religious groups, child advocacy organizations, and elected officials.

A Machine Learning Approach to Solve Partial Differential Equations
Presenter: Nathaniel Jones
Faculty Mentor: Dr. Chuan Li
Department: Mathematics

Artificial intelligence (AI) techniques have advanced significantly and are now used to solve some of the most challenging scientific problems, such as Partial Differential Equation models in Computational Sciences. In our study, we explored the effectiveness of a specific deep-learning technique called Physics-Informed Neural Networks (PINNs) for solving partial differential equations. As part of our numerical experiment, we solved a one-dimensional Initial and Boundary Value Problem that consisted of Burgers' equation, a Dirichlet boundary condition, and an initial condition imposed at the initial time, using PINNs. We examined the effects of network structure, learning rate, batch size, and other factors that influenced the network output and characterized the tradeoff between training speed and solution quality. In addition, we solved the problem using a standard Finite Difference method. We then compared the performance of PINNs with the standard numerical method to gain deeper insights into the efficiency and accuracy of PINNs.

Predictive Analytics in Law Enforcement: Unveiling Patterns in NYPD Crime through Machine Learning and Data Mining
Presenter: Jisha Sheela Kumar
Faculty Mentor: Dr. Md Amiruzzaman
Department: Computer Science

Abstract: Urban crime presents complex challenges that undermine the socio-economic framework of cities. Addressing the pressing need for advanced crime analysis techniques, this study leverages machine learning and data mining to enhance predictive policing within New York City's urban landscape. An extensive NYPD crime dataset from 2006 to 2017 serves as the foundation for this analysis, with a focus on recognizing historical patterns and projecting future crime trends. A diligent methodology ensures data integrity, with advanced algorithms such as Random Forest and K-Means clustering dissecting the complicated spatio-temporal dynamics of crime. This exploration reveals distinct crime hotspots and discerns patterns in criminal activity over time, contributing to more strategic law enforcement resource deployment and community engagement. The study's insights aim to reinforce the NYPD's preemptive capabilities, with a keen understanding of the ethical implications inherent in predictive policing. This report scrutinizes data privacy concerns, addresses potential biases in algorithmic design, and considers the impact on community-police relations. Ultimately, the analysis provides actionable recommendations for operational enhancements and underscores the importance of continuous innovation in data-driven public safety strategies, advocating for the integration of new data sources and analytical methodologies in evolving smart city infrastructures.

Analyzing the Impact of Smoking and Drinking on Health Metrics in Korea
Presenter: Priyanka Logasubramanian
Faculty Mentor: Dr. Md Amiruzzaman
Department: Computer Science

Abstract: This investigation rigorously investigates the ramifications of smoking and alcohol consumption on health parameters within the demographic context of South Korea, leveraging an extensive dataset from the National Health Insurance Service of Korea. The study seeks to construct and validate predictive models by applying logistic regression methodologies alongside outlier detection and cross-validation techniques. These models are geared towards discerning patterns in smoking and drinking behaviors, offering predictive accuracy. The analysis elucidates the interplay between lifestyle decisions and crucial health indicators such as liver enzyme activity, lipid profiles, and hemodynamic parameters. The outcomes of this study are poised to contribute significantly to the formulation of targeted public health strategies, aiming to mitigate the risks associated with lifestyle-induced health conditions.

Applying Executive Function for the Sake of Well-Being: A Case Study of Gifted Middle Schoolers
Presenter: Erika Lucas
Faculty Mentor: Dr. Heather Schugar
Department: Educational Leadership and Higher Education Administration

This study gave middle school student participants the chance to discuss the complexities of gifted culture in academia as they have experienced it and sought to pinpoint the emotions or feelings that students and their parents experienced as they transition to high school concerning their perceived sense of confidence and readiness as it pertained to executive function. Gen Z students deemed "gifted" are at a higher risk for depression and suicide due to the rising levels of stress and anxiety they experience (Andrews, 2014). Klimkeit et al. (2011) discovered that teenagers with depression and/or anxiety disorders exhibited impairments in working memory and processing speed, which are crucial executive skills. Experts advocate the use of mindfulness activities to develop and refine executive functioning skills in gifted students to enhance their mental and emotional well-being (Sisk, 2021). Because gifted students are educated in elementary and intermediate schools in a systematic and assisted manner, the need to hone executive functioning skills in these settings is reduced. The issue arises when students enroll in advanced courses in high school, which require them to exhibit complex executive functions. Many previous studies neglect to include the perspectives and experiences of adolescents immersed in gifted culture regularly, and this case study chose to do the opposite by amplifying these voices. Using focus groups, surveys, webinars as interventions, and student reflection, the findings of this study suggest that gifted students benefit from explicit instruction about executive function, the practicality and application of these skills, and a non-judgmental space to practice honing these skills and reflecting on these strategies.

Breaking Barriers: Creating NeuroInclusive Workplace
Presenter: Nikita Maharjan
Faculty Mentor: Dr. Pablo Arriaza
Department: Social Work

The study aims to improve understanding of Neuroinclusivity at Workplace by learning from the lived experiences of our participants. This is an exploratory study where we are conducting semi-structured interviews with neurodivergent participants. It will explore and analyze the responses received from the participants and hopes to initiate a discussion on what could be our roles in creating more neuro-inclusive workplace for all.

Validation of the Perceived Barriers in Athletes to Seeking Mental Health Help (PBAS-MH) Survey Across NCAA Divisions II & III
Presenter: Jennifer Majorczak
Faculty Mentor: Dr. Lindsey Keenan
Department: Sports Medicine

As the National Collegiate Athletic Association (NCAA) prepares to release the updated Mental Health Best Practices document in 2024, the awareness around addressing mental health in student-athletes in the sport psychology and sports medicine fields has increased tremendously since the initial document publication in 2016. Despite increased awareness and support, research has demonstrated student-athletes are less likely to seek help for their mental health compared to their non-athlete peers. Furthermore, there is minimal evidence demonstrating the reasons behind mental health help seeking behaviors in student-athletes. Numerous surveys measuring attitudes and perceived barriers towards seeking mental health help exist for the general population. However, there is no survey validated in a student-athlete population. The purpose of the present study was to validate the Perceptions of Barriers to Seeking Mental Health Help (PBAS-MH) survey, developed in 2023 through a pilot study, in the collegiate student-athlete population. The PBAS-MH was administered and sent to all NCAA colleges and universities' head athletic trainers and athletic director within the Northeastern US. The survey's internal reliability had a Chronbach alpha of .831 for the total survey. An exploratory factor analysis determined items loaded across four factors. Items that loaded onto factor 1 had an internal reliability of .832. The 6 items in factor 1 relate to the internal/self-stigma of seeking mental health help and would be useful as a shortened, reliable version of the survey. The PBAS-MH may be used in the future to identify specific perceived barriers to seeking mental health help in the student-athlete population.

Bioheat Equation Analysis
Presenter: Johnathan Makar
Faculty Mentor: Dr. Chuan Li
Department: Mathematics

In our research, we are investigating Pennes Bioheat equation, which is used for simulating the propagation of heat energy in human tissues. This equation was proposed by Pennes in 1948 based on his experiments of measuring the radial temperature distribution in the forearm of nine subjects. Pennes' equation provides the theoretical basis for studying heat transfer in perfused tissue and has been widely studied since then. However, Pennes' equation has been criticized for various reasons, including the fact that his experimental data did not seem to match the model. One of the objectives of our work is to find the best parameter values that can be used to accurately match the computational solution with the experimental results. The data collected from this research will be used as preliminary results for another study, which aims to model the procedure of Magnetic Fluid Hyperthermia treatment for curing human cancers and tumors.

Silent Sky Dramaturgical Analysis
Presenter: Elijah McBride
Faculty Mentor: Dr. Christen Mandracchia
Department: Theatre Arts

This creative research activity is a dramaturgical investigation of the play Silent Sky by Lauren Gunderson. Dramaturgy is the study and analysis of dramatic and theatrical materials. In the WCU Theatre Arts department, a dramaturg is appointed to the production staff of a show to investigate the script, research the context and content of the piece, and relay information to the cast, crew, and audience. Silent Sky is a historical drama based on the life of Henrietta Leavitt, the female astronomer whose discoveries proved that the universe is wider than the Milky Way Galaxy. This creative activity is a compilation of the dramaturgical work and materials put into the show, including research, resources, communication, and events.

Let's Talk About Diversity: The Use of Discussion in Alleviating Students' Fears
Presenters: Dr. Shannon McQueen, Corey Lane
Department: Political Science

What are students' fears and comforts around dialogue in the classroom? As the United States' political and social climate is rife with tribalism and polarization, it is increasingly important to equip students with skills to navigate difficult conversations with those who have diverse views as part of developing an informed citizenry. A growing body of research suggests the value of intergroup dialogue (Schoem and Hurtado 2001) in helping students to build relationships across diverse groups, promote social justice causes (Gurin et al. 1999; Mildred and Zúñiga 2004), and reduce affective polarization (Levendusky and Stecula 2021). Yet, college students across the United States appear reluctant to discuss controversial topics in and out of the classroom (Zhou and Zhou 2022; Zhou and Barbaro 2023). Using a novel survey and focus groups of students in a 'Politics of Diversity' class, we investigate how comfortable students feel navigating tough conversations with those who have differing views, what fears or perceptions surround discussion with those of different views, and if exposure within a class can reduce those fears. Results highlight that the majority of students value open discussions and political tolerance and recognize importance of a sense of belonging within classroom discussions. Optimistically, the findings highlight the ability and desire for students to engage in discussion across difference and emphasize the role educators have in cultivating sense of belonging in the classroom.

Philadelphia Veterans and Resource Insecurity Study
Presenter: Casey Mihalik
Faculty Mentor: Dr. Brie Radis
Department: Social Work

Introduction
Eight percent of people experiencing homelessness in 2021 were military veterans (U.S. Department of Housing and Urban Development, 2022). What are the opinions about the VA benefits system, from Philadelphia area veterans experiencing resource insecurity?
Method
Through partnership with the Philadelphia Veterans Multi-Service Center (VMC), surveys and interviews were administered to 15 participants in addition to 40+ hours of ethnographic observation of veterans utilizing this day service center. Surveys/interviews focused on participants' experiences applying for VA benefits. Ethnographic observations were focused on the day-to-day functioning of the day service center.
Results
The majority of participants (n=10) reported either a favorable or undecided opinion of the VA benefits system. Common complaints were racial discrimination (n=5) and the length of the application process (n=7). All 15 participants reported a very favorable opinion about the VMC's efforts to advocate and assist in the acquisition of VA benefits. 14 of 15 participants had applied for VA benefits and 7 answered that they currently receive VA benefits.
Discussion
100% of participants (n=15) stated that any VA benefit would improve their quality of life. Healthcare and mental health supportive services were reported as the most useful benefits (n=10). A more diverse VA staff and greater community outreach regarding benefit eligibility and application may help mitigate challenges veterans face acquiring VA benefits.

"Thumbs up, down, and sideways: The ups and downs in the development of a survey instrument to investigate PreK student trust in teachers"
Presenter: Sara Mohler
Faculty Mentor: Dr. Sarah Lightner
Department: Literacy

Due to a widening demographic dissimilarity between teachers and P-12 students (Digest of Educational Statistics, 2023), training culturally responsive educators has become an imperative in teacher preparation programs. Establishing learning partnerships that enable culturally responsive teaching requires that teachers are able to develop trust with their students (Romero, 2010, Klein et al., 2019). Measures are available to gauge both sides of the trust relationship, looking at the ways in which preservice teachers extend trust-building activities to their students as well as how students describe their trust in teachers and faculty. However, the existing student-facing instruments have been designed with elementary and older students as the target audience. Working within a larger research project, this describes the earliest stages in developing a survey instrument to measure how preK children experience trust in preservice teachers. Adams and Forsyth's (2004) Student Trust in Principal and Student Trust in Faculty surveys provide the format for an updated survey instrument. This study describes the first semester pilot of a draft survey instrument and plans for continued work toward instrument validation.

A Theory of Political Engagement
Presenter: Nicola Murray
Faculty Mentor: Dr. Simon Ruchti
Department: Philosophy

A preview for a project that will apply the interdisciplinary approach to political theory in modern America. The research intends to touch on the history of nationalism, the current ideological divides that drive our political climate, and the future of policy making, both on the domestic level and internationally. The entire theory is based on an interpretation of Maslow's Hierarchy of Needs that shifts the lens away from the individual and onto the society.

Women and The Congress of Vienna
Presenter: Skylar Painter
Faculty Mentor: Dr. Robert Kodosky
Department: History

Following Napoleon's abdication on April 11, 1814, European statesmen were left to organize the Congress of Vienna (1814-1815) with the goal of stabilizing Europe. These statesmen, such as Russian Tsar Alexander I and Austrian Foreign Minister Metternich, were surrounded by women during the Congress. The relationships these women had with both Metternich and Tsar Alexander allowed them to influence the proceedings of the male-dominated Congress. Women, such as the Duchess of Sagan and Princess Bagration, ran popular salons and manipulated their sexuality in order to achieve their personal aims. Madame Krudener manipulated Tsar Alexander's appreciation for Christian mysticism to do the same. Finally, other anonymous chambermaids participated in espionage to assert their political agency. This presentation, titled "Women and The Congress of Vienna" analyzes how the atmosphere of the Congress, including the political and personal tensions between statesmen, culminated in women having a heightened influence on the proceedings, particularly for the male-dominated field of 19th century politics. This analysis was developed by Skylar Painter, an undergraduate student at West Chester University majoring in History and Secondary Education. She can be contacted at skylarpainter16@gmail.com.

Analysis of WCU Andean Headwear
Presenter: Sadie Patterson
Faculty Mentor: Dr. Zachary Voras
Department: Chemistry

This project investigated the chemical composition of a collection of indigenous Andean hats and headdresses in the West Chester University Museum of Anthropology and Archaeology. Utilizing micro-x-ray fluorescence (XRF) and Fourier-transform infrared (FTIR) spectroscopy for elemental identification and molecular analysis, respectively, a combination of natural and synthetic materials were found in the headwears' production. The bases of the hats tend to have wool or cotton present, while additional decor such as ribbons and embroidery tends to be synthetic. More information is needed to determine whether many synthetic decorations were added during or after the production process. Areas of further interest and investigation are located in beadwork, sweatbands, and powder residue. The data gathered during this project will be used for advising museum studies students and faculty on proper handling of artifacts, best practices for caring for and storing the collection, and for the creation of a database to make museum collections more accessible to university and non-university agents.

An Augmented Matched Interface and Boundary (AMIB) Method for Solving Problems on Irregular 2D Domains
Presenter: Benjamin Pentecost
Faculty Mentor: Dr. Chuan Li
Department: Mathematics

A new method called Augmented Matched Interface and Boundary (AMIB) has been developed to solve partial differential equation models, such as the heat equation, over irregular two-dimensional domains. The original AMIB method features unique numerical treatments to solve problems with various boundary conditions and shapes, resulting in highly accurate and efficient numerical solutions. However, recent numerical experiments have revealed that the original AMIB method can fail when dealing with sharply curved boundaries. To address this issue, new numerical techniques have been introduced in our latest work to enhance the robustness of the AMIB method. These techniques have been numerically verified to improve the accuracy and efficiency of the AMIB method when solving various problems with sharply curved boundaries. Due to its success, we plan to use this method to simulate Magnetic Fluid Hyperthermia (MFH) cancer treatment by solving the Pennes Bioheat Equation on a domain that consists of a tumor and the surrounding healthy tissue.

Making Minorities Visible in the Work of Alexandre Dumas
Presenter: Dr. Roxane Petit-Rasselle
Department: Languages and Cultures

My goal is to create experiences rooted in the history/peoples of this region exposing whitewashed histories and displacing colonial- and white-centered narratives. These journeys are to places with a social justice or moral significance providing a transformative experience and making course materials more concrete for students. Students engage in readings, other course materials, and conversations prior to visiting a place. Course materials center, whenever possible, the stories, experience and wisdom of BIPOC communities. The power of visiting places makes the events, people, and history feel more real.

21st Century Plague: Incel Addition
Presenter: Kayla Redfern
Faculty Mentor: Dr. Simon Ruchti
Department: Philosophy

With the prevalence of hegemonic masculinity, a whole new set of masculine identities have emerged. Not the typical identities that align within sexual orientation, but those that exist to "challenge" lesser identities and feminism. These cisgender heterosexual masculine "identities" alpha, beta, and zeta - view feminism as corrupt and as something holding them back from being their true selves. These masculine identities correspond within the deep, dark corners of the internet, thriving on Reddit - an anonymous app where anyone can post anything without repercussions. And thus, it allows for new ways of hegemonic masculinity and men to show their true colors of who they really are. This research paper aims to linguistically analyze the language that involuntary celibates (also known as incels) use to pity themselves as well as how they describe women, and how their toxic masculinity is not only problematic, but also extremely dangerous for women, feminists, and other minorities who do not agree with their views on life. Thus, this analysis will prove how Western masculine identities are blown out of proportion from three different scholarly sources as well as posts taken from specific subreddits.

Meaningful Connections to Art: Merging Place-Based and Arts-Based Encounters
Presenters: Dr. Pauline Schmidt, Dr. Matthew Kruger-Ross
Departments: Secondary Education & K-12 Health & Physical Education, Educational Leadership & Higher Education Administration

Our research aims to cultivate the creativity and imagination needed for preservice teachers (PSTs) to not only enter the profession, but to sustain them over a meaningful career. Our guiding research question is: How do arts-based pedagogies and place-based experiences inform and develop PSTs' creative and imaginative capacities for planning and implementing effective instruction for student success?

We need teachers who can cultivate relationships between their own students and subject matter in such a way that empathy, understanding, and social justice guide their practice. We believe that this aim can best be accomplished by creating a scaffolded, immersive experience for PSTs that will support them as global citizens and critically reflective practitioners. We will accomplish this by engaging our PSTs in several structured, arts- and place-based experience in urban centers, such as New York City, Philadelphia, and Washington, D.C. This will include several museum visits, musicals/plays/ballets, as well as guided tours of significant spaces in these cities.

We center the travel and arts to focus on the complicated relationship of race and gender in the United States. PSTs will ultimately create activities and lesson plans inspired by these experiences that they will implement in their field placements and possibly student teaching. We will specifically target our population of first-generation students, as they are less likely to have traveled beyond the immediate area that they grew up in. We have received funding that makes these experiences accessible and affordable, especially for our first-generation students. Not only must PSTs be given the opportunity to broaden their minds and horizons, but first they must be taught how to visit these spaces and then how to translate these experiences into their future planning as secondary teachers.

Food Insecurity in College Students: West Chester University Philadelphia Campus Food Pantry
Presenter: Emma Sonneborn
Faculty mentor: Dr. Brie Radis
Department: Social Work

Many college students face food insecurity on a daily basis. Those in bad financial situations may not be able to afford a substantial meal or to regularly grocery shop so they feel like their only option is to ration out the food they currently have. Food pantries have been set up around campuses across the country, including ours, to help make sure students can afford and have access to these necessities. Food pantries help make sure that all people have the opportunity to create well balanced meals in their living facility and that they stay healthy. The goal of this research is to further build upon the resource pantry on the Philadelphia campus, which is around a year old now. It was to make sure that students can get the same opportunities as other students who may not face the same challenges. The survey sent out will gauge the needs directly from the students and give them the opportunity to voice their needs and opinions. It will show us disparities that we will have the opportunity to correct. Most importantly, it will allow those struggling in their daily lives to have a weight lifted off their shoulders.

Findings from urban teacher alumni / Building post-graduation supports
Presenter: Dr. Paul Sylvester
Department: Early and Middle Grades Education

The purpose of this presentation is to share findings from surveys (n=28) and interviews (n=7) of alumni of the Early and Middle Grades Education programs who are working in urban schools or schools with diverse student bodies and high numbers of lower income students. In particular, it highlights how these findings have informed planning for post-graduation support for these teachers.

Universal Basic Income: For and Against
Presenter: Dr. Larry Udell
Department: Philosophy

The question of whether to grant all citizens a basic income that would starts with adulthood is the source of much controversy today among people who believe that government should do something to address income inequality (including but not limited to addressing increasingly widespread poverty and homelessness). Philippe Van Parijs famously advocated such a policy, but his proposal was rejected by John Rawls, who demurred at subsidizing Malibu surfers with public support for their leisure and instead emphasized the need for a full employment policy. I argue that a slight modification of Rawls's theory might allow for a limited UBI in a Rawlsian "well-ordered society" where full employment is the main objective of a just economy.

"If you are well, your baby will be well": The Needs of Adolescent Mothers in Chester County, Pennsylvania
Presenters: Naya Weeks, Maitiya Meadows
Faculty Mentor: Dr. Chiwoneso Tinago
Department: Public Health

Studies have been developed to evaluate effective parenting interventions to improve caregiving practices however, these interventions have seldom been implemented in adolescent mothers—a high-risk population. To develop an effective intervention for adolescent mothers, researchers must understand the challenges they face around caregiving and their well-being and involve adolescent mothers in determining appropriate interventions to address their needs. This research aims to identify recommendations for interventions to address adolescent mothers' needs related to caregiving and parenting. 12 adolescent mothers ages 21 and younger from Chester County, Pennsylvania completed interviews and questionnaires regarding their well-being, caregiving and parenting. Findings emphasize the need for educational resources for adolescent mothers about pregnancy, prenatal care, and parenting strategies, in addition to caregiving support. Participants described the importance of self-care and mental health when raising their children and suggested interventions for adolescent mothers to prioritize their own well-being to best care for their children. Results of this research will inform the development of a parenting and well-being intervention for adolescent mothers in Chester County.

Social science meets mathematics: An interdisciplinary approach for researching sensitive topics
Presenters: Dr. Julie Wiest, Dr. Clifford Johnston
Department: Anthropology & Sociology, Mathematics

Social science research relies on study participants' truthful responses, and confidentiality is typically ensured in the accompanying informed consent statement. Yet, studies with sensitive topics or that involve members of vulnerable or marginalized populations may encounter a higher degree of dishonesty, as the subjects may not want even the researcher to know their true attitudes, experiences, and/or behaviors. Their reluctance may be based on fear of embarrassment, especially when the true response is not deemed socially acceptable, or perhaps fear that the researcher will be made to feel uncomfortable, frustrated, or angry. If we wish to collect meaningful data under these circumstances, however, we will need to remove the social incentive to provide a false answer. Drawing on an innovative mathematical approach to collecting sensitive information that is described in the paper "Obtaining Answers to Sensitive Survey Questions using Venn Diagrams," we demonstrate how this method can be implemented within the social sciences to improve study designs when researching sensitive topics. The method is applied by first collecting responses to compound questions involving random events. This obscures the individual's answer to a sensitive question, but the number of positive responses can be recovered using a simple analysis based on solving a Venn diagram. We discuss several areas of social science research in which this method would be ideal, while also demonstrating the value of interdisciplinary research collaborations.

Exploring Treatment-Seeking Decisions at the Time of Stroke Onset
Presenter: Dr. Reva M. Zimmerman
Department: Communication Sciences and Disorders

Introduction: Studies demonstrate that individuals hesitate to go to the emergency department (ED) at stroke onset. Proximity to stroke centers, living alone, mild symptoms, and Black race, among other factors, are associated with presentation times greater than four hours post-onset – which in turn relates to worse stroke outcomes. While large-scale quantitative analyses reveal trends in onset-to-ED times, the fundamental reasons that people wait to seek intervention remain unclear. The purpose of the current study was to explore stroke survivors' treatment seeking decisions at the time of their strokes using qualitative methodology. Methods: Sixteen eligible stroke survivors in the Greater Philadelphia area completed surveys and semi-structured interviews. Interviews were transcribed by trained team members, and the data are currently being coded and analyzed using a phenomenological approach. Results: Preliminary themes in the data indicate that individuals often attributed mild, non-motor symptoms to stress or viral infections. Stroke signs identified within the FAST acronym, such as motor and language changes, more commonly led survivors or their families to seek emergency services quickly. Most survivors reported reaching local hospitals within an hour of symptom onset and being admitted relatively quickly; however, the women in this study reported taking longer to reach the ED, regardless of their marital status. Conclusion: Initial findings suggest that promoting more awareness of a greater number of stroke signs (e.g., BE FAST), particularly among women, may reduce onset-to-ED times at stroke onset.

Making Carbon Quantum dots (CQDs) from degraded cellulose.
Presenter: Simret Asefa
Faculty Mentor: Dr. Abbie Ganas
Department: Chemistry

Carbon quantum dots (CQD) are nanoparticles that are less than 10nm and relatively new. CQDs are carbon based nano materials. CQD's are used as drug delivery, bio sensing, as well as biosynthesis. Carbon quantum dots were first discovered in 2004 from components of fluorescence nanoparticles during a nanotube purification of a singles-walled carbon. Carbon quantum dots are usually synthesized from harsh chemicals as well as starting materials such as H2SO4 which is a highly acidic and can be harsh to the environment. Instead of implementing such harsh products into making CQD Eco-Friendly chemicals can be used, weak acids and bases that won't hurt the environment as well as being convenient and inexpensive. Making CQD's this way is efficient. CQD's that are made using environmentally friendly are very nontoxic compared to their non-environmentally friendly counterparts, they are cheap and have good biocompatibility. CQD's made from eco-friendly materials can replace toxic metals such as Graphite quantum dot's (GQD's). GQD's have electrical and opto-electrical properties. But in comparison to GQD's, CQD's have; low toxicity, higher stability and biocompatibility. CQD's can also combat environmental hazards is made using eco-friendly materials because they won't be adding to the pollution that is already happening by many other materials.
The expectations vs. results for this process were as expected. Although literature showed the synthesis of CQDs were made from many unclean and environmentally taxing starting materials as well as reagents. By using environmentally fitting starting materials as well as reagents. Paper was first extracted from recycled or shredded and washed with acetic acid. In order to make CQDs the reagents used were easily accessible such as NaOH and water. For degradation HCL and water were used in the microwave at 200 watts, household microwaves go as high as 1100 watts which makes it easily tangible. Moreover, as expected we were able to make CQDs with mostly environmentally friendly and accessible reagents.

Interaction and biogeographic of Ants and Nematodes
Presenter: Areeba Asim
Faculty Mentor: Dr. Manuela Ramalho
Department: Biology

Ants are one of the most diverse and widespread groups that play an important role in the terrestrial ecosystem. Their connection within environments is crucial in roles such as soil engineers, predators, and recyclers of nutrients. With over 14,000 species described worldwide, ants belong to the diverse family Formicide, and their ecological success is frequently attributed to essential interactions with various microbial partners. Besides, extensive research done on ant interaction with bacteria and plants, less attention has been given to their interaction with nematodes. Our goal is to investigate the species involved in these interactions and examine the biogeographic patterns of the ants and nematodes. This study will identify the gap by compiling primary literature publications on ant-nematode interaction through meta-analysis. The statistical analysis will be conducted in R software, utilizing the dplyr package. Then Pearson's Chi-squared with stimulated p-values will be used to determine the relationship between ants and nematodes. As species interactions are critical in evolution, the importance of this study will guide the scientific community in monitoring and conserving species biodiversity.

Psychological and Psychosocial Effects of Contemplative Practices in the Athletic Population: A Systematic Review
Presenters: Victoria Baker, Dr. Emily Duckett
Faculty Mentor: Dr. Emily Duckett
Department: Sports Medicine

Mental health concerns in athletes are becoming a primary focus for institutions, companies, coaches, and more. An athlete carries an abundant load of stressors due to their lifestyle. The stressors can negatively impact an athlete by producing anxiety, depression, insomnia, and other mental health issues. Previous studies have found a connection between the use of contemplative practices on psychological and psychosocial effects in athletes, creating an opportunity to evaluate the research of contemplative practices in the athletic population. Therefore, the purpose of the current study is to summarize the evidence and rate the quality of research surrounding the psychological and psychosocial effects of contemplative practices in the athletic population through a comprehensive search of scholarly literature. A systematic review was conducted using nine electronic databases. Seven studies were included in this review, each assessing how contemplative practices affect the mental health of athletes. The Mindfulness-Acceptance-Commitment (MAC), Psychological Skills Training (PST), Mindful Sport Performance Enhancement (MSPE), Mindfulness-Integrated Cognitive Behavior Therapy (MiCBT), and Hatha yoga were the most utilized interventions in the reviewed literature. Results suggested that the interventions had a positive effect on an athlete's mental health, specifically related to anxiety and depression. Discovering the benefits of contemplative practices will help healthcare providers, and others who work directly with the athletes, provide the best quality care.

Exploring Self-Reported Relationship and Dating Violence and Social Support Among College Students
Presenter: Karli Behler
Faculty Mentor: Dr. Jane Tucker
Department: Criminal Justice

Relationship and dating violence, commonly referred to as intimate partner violence (IPV), is a prevalent problem on college campuses. The current study seeks to explore the nature and extent of dating violence, exploring its dimensions alongside the impact of social support amongst a cohort of West Chester University students. Using a 42-question survey, respondents answer questions about their experiences with dating violence and their perceived level of social support. In addition, the survey contained measures related to substance use, often associated with intimate partner violence. This study is a requirement of CRJ 600: Proseminar and is currently underway. The subsequent presentation will review the study findings.

Letting Food Labels Guide College Students' Food Purchases
Presenters: Arianna Belohoubek, Dr. Sandra Walz, Dr. Dara Dirhan
Faculty Mentor: Dr. Dara Dirhan
Department: Nutrition

Purpose: To educate WCU students on how to use a food label reading tool to make informed food and beverage choices.
Methods/Design: A pre-post survey study design is being conducted among college students to teach them in two sessions how to use an innovative food label reading tool, calculate food and beverage scores, then apply the tool when making food and beverage purchasing decisions.
Outcomes/Implications: This study is currently in progress with a completion date of March 7, 2024. All outcomes and implications will be compiled at that time, well in advance of Research Day.

Comparative Analysis of Large Language Model Architectures in Interpersonal Conflict Resolution
Presenter: Matt Boraske
Faculty Mentor: Dr. Richard Burns
Department: Computer Science

Since the advent of the transformer architecture in 2017, Large Language Models (LLMs) have significantly advanced the field of natural language processing. The development of decoder-only LLMs, such as Llama2, marks a notable shift away from the traditional encoder-decoder architecture. These LLMs excel in open-ended question answering by leveraging knowledge learned while training on massive datasets and then analyzing input within its natural context, bypassing a separate encoding phase. In contrast, FLAN-T5 exemplifies the encoder-decoder architecture, where its encoder plays a crucial role in sequence-to-sequence processing by converting the input context into a rich internal representation. This transformation proves particularly advantageous in tasks that require a deep understanding of the input, such as summarization and question-answering when the solution can be explicitly derived from the input.
This research investigates the comparative effectiveness of FLAN-T5 and Llama2 in a novel context: the resolution of interpersonal conflicts. The study utilizes a dataset from Reddit's r/amithea**hole subreddit, which includes posts from 2019 to 2022 where users seek feedback on their interpersonal conflicts. This dataset, comprising classifications and justifications of user behavior, serves to evaluate both models' performance in their zero-shot state and after fine-tuning. The investigation aims to uncover the capabilities of each model in classification and conflict resolution, as well as their adaptability through fine-tuning. This approach seeks to elucidate the strengths and weaknesses of these architectures in complex real-world communication scenarios, with potential implications for future developments in LLMs for social and interpersonal applications.

Targeting Single-Use Plastics: Determining Impacts of Location on Trash Amounts and Effectiveness of Bans
Presenter: Adeline Brown
Faculty Mentor: Dr. Megan Fork
Department: Biology

Since the early 1900's, when plastic production began, the disposal of single-use plastics has become an increasing environmental issue. Rather than ending up in designated waste areas such as landfills, large quantities of plastic litter make their way into freshwater and ocean systems. This plastic can pose a significant threat to aquatic wildlife and human health, especially when broken down into microplastics. As a result, many municipalities and states throughout the U.S., in addition to many countries across the world, have begun to implement bans and taxes on single-use plastics such as plastic film shopping bags and plastic drinking straws. The negative impacts of single-use plastics have been well-documented in ocean environments, but not as readily in freshwater environments. Our project focuses on plastic litter in nine urban streams in southeastern PA. Of these streams, three are located in watersheds where plastic bans have been active for at least one year, another three are in watersheds that have no plastic bans, and the remaining three are in watersheds that have had plastic bans established in January 2024. Trash has been collected on three separate occasions at each of the nine streams, between September 2023 and December 2023. Based on the data collected and categorized, we will share preliminary results on the effectiveness of bans in these areas and identify if any characteristics of the watersheds, such as population density and land use, help to explain differences in the amounts of trash present in streams.

Understanding Teacher Retention and Shortages
Presenters: Dr. Jade Burris, Dr. Jacqueline Van Schooneveld
Department: Early and Middle Grades Education

This poster proposal is part of a larger multi-phased study that uses a mixed methods approach of survey and focus group interview data. This presentation is based on initial phases of the study that include that collection, coding, and analysis of survey data. The survey is modeled after the Kansas Retention Survey (2022) and the National Teacher and Principal Survey (IES, 2020). Participants include current classroom teachers (infants to grade 12), childcare directors, instructional coaches, teacher specialists (i.e., reading specialists, gifted teachers, etc.), administrators, and higher education faculty and staff affiliated with teacher preparation programs. Participants also include "retired" teachers, anyone who has left the profession in the last 10 years. Participants will represent a diverse group of professionals. We anticipate themes and categories to emerge from quantitative survey results. These emerging categories will be used to begin the initial identification and categorization of types of retention. The categories and definitions will be shared for the conference presentation.

Educational Practices that Support Student Learning, Engagement, and Training in Culinary Medicine
Presenters: Jake Cahill, Dr. Patricia Davidson, Dr. Amir Golmohamadi, Dr. Hossein Vojoudi
Faculty Mentor: Dr. Patricia Davidson
Department: Nutrition

Background: Nutritional status and poor dietary patterns are key drivers in the development of chronic diseases (CD). In response to this and the increased occurrence of CD, future healthcare professionals need to be trained in person-centered, interprofessional, and accessible care. Training healthcare professionals in Culinary Medicine (CM) incorporating the science of food and medical nutrition therapy (MNT) can move beyond food behaviors for providing more practical, person-centered interventions.
Objective: This qualitative and exploratory study evaluated the current educational needs for incorporating CM into the curriculum for health science majors (i.e., physician assistants, nursing, and nutrition).
Methods: Participants were recruited by sending an invitation through the Pennsylvania Academy of Nutrition and Dietetics (PAND) listservs to participate in 30-40-minute Zoom focus groups, exploring the need for incorporating culinary medicine into the curriculum. Semi-structured interviews with healthcare professionals and educators were used to obtain information regarding the current educational landscape and what is needed to train students.
Results: Eleven healthcare professionals (dietitians and nutrition/dietetics educators) participated in 2 focus groups. Themes identified in this study include expanding courses focusing on teaching fundamental kitchen chemistry and biology, food ingredients, cultural aspects of food choices, food science, sensory skills. The focus groups identified the current educational and training gaps in the current curriculum and student educational opportunities.
Conclusion: Training future nutrition and health professionals in food sensory evaluation, as part of the curricula is needed. This training can provide the necessary tools for integrating individual preferences and promote more inclusive care.

Decadal Shifts in Rainfall Patterns: Alterations in Rainfall Variability in Gishwati
Presenters: Ava Calligaro, Chloe Baumann, Brenna Lee
Faculty Mentor: Dr. Rebecca Chancellor
Faculty Department: Psychology

Over the last ten years, the analysis of rainfall variability of Gishwati forest, Rwanda has become increasingly important, especially when considering the implications of climate change. The possible fluctuation in environmental factors prompts the suggestion of possible environmental or species-specific issues of instability in their changing environment. To compare rainfall data over a ten-year period at the Gishwati site, we analyzed data that had been collected from research assistants at the site from 2010, 2015, and 2020, consecutively and compiled the averages for each year, as well as the entire decade. From there, each year was broken down by month and compared the amount of rainfall over a 6-month period (January to June) to see if there were any notable differences. After observing the data from 2010 to 2020, it can be inferred that there has been a shift in the occurrence of the wet season to later in the year, with the largest average rainfall moving from January, to March, to May, respectively. There was a 20.56% increase in rainfall from the six-month period of January through June of 2010 to the same 6 month period in 2020. This demonstrates a shift in rainfall over the course of ten years in Gishwati, which can have an impact on the surrounding environment and various animal species, such as frugivorous chimpanzees, that rely on rainfall during specific months.

The Effects of Prenatal Alcohol and Nicotine Exposure on Later-Life Drug-Seeking and Memory-Related Behaviors
Presenters: Zoe Campanella, Arielle Lightbourne
Faculty Mentor: Dr. Kristen Breit
Department: Psychology

Alcohol and nicotine are the two most commonly consumed licit substances among pregnant people. Separately, prenatal alcohol or nicotine exposure have been associated with increased drug seeking behaviors and impaired memory performance later in life. Co-consumption of alcohol and nicotine is also common during pregnancy with the increasing popularity of e-cigarettes. Despite high prevalence, there is sparse research examining whether combined prenatal exposure to alcohol and nicotine via e-cigarettes may exacerbate deficits observed from singular prenatal exposure to these drugs. Preclinical rodent models are ideal in teratology research due to their translational findings, controlled environments, and rapid developmental timelines. This study examined the effects of prenatal co-exposure of alcohol and nicotine via e-cigarettes on offspring drug-seeking behavior and memory performance later in life. Pregnant rats were exposed to alcohol, nicotine, the combination, or vehicle from gestational days (GD) 5-11, mimicking the human first trimester of pregnancy, the most common trimester to engage in substance use. Following birth, separate groups of offspring were examined for nicotine self-administration during adolescence (postnatal days [PD] 30-44) and adulthood (PD 60-74) using a nose-poke vapor inhalation apparatus. Additional separate groups of offspring were examined for memory behaviors during adolescence (PD 30-31) and adulthood (PD 60-61) using an object recognition task, which requires subjects to identify a novel object to illustrate memory performance. Data are currently being collected for both tasks, providing valuable information regarding potential risks of combined prenatal alcohol and nicotine exposure on later-life susceptibility to substance use and/or memory impairments.

The Use of TV Series as a Tool for Self-Care Among School Counselors
Presenter: Averi Clarke
Faculty Mentor: Dr. Vickie Ann McCoy
Department: Counselor Education

As school counselors, we dedicate ourselves to our students in and outside of school and without realizing it, we easily forget to care for ourselves. However, we are obligated to care for ourselves to provide the best quality of service to our students, school, and collogues (ASCA, 2022). The American Counseling Association emphasizes that school counselors must, "practice wellness and self-care through monitoring mental, emotional and physical health (2022)." One method of self-care that has yet to be explored critically through research is the potential benefits of engaging with television series. Television series engagement may be linked to reduced anxiety and burnout from job related stress (Castle, 2019; Derrick et al., 2008).

It is critical for the social and emotional health of school counselors to build social relationships outside of school. Yet, school counselors do not have time for "water-cooler talk," or many opportunities to connect personally with collogues. Engaging with TV series is a convenient alternative to social support from interpersonal relationships. Watching TV series, as a method of self-care, can supplement relationships when support is constrained by time, distance, or other factors. Additionally, it can help foster existing or new relationships with others engaging in the same series, simultaneously providing convenient temporary care and real meaningful connection with others.

By understanding the benefits of TV series engagement, we can learn how to incorporate it into our self-care routines in healthy and meaningful ways and ultimately provide the best quality of service to our students and ourselves.

Molybdenum Sulfide Catalysts for a Hydrogen Evolution Reaction
Presenter: Tyler Czeiner
Faculty Mentor: Dr. Danielle Chirdon
Department: Chemistry

A hydrogen evolution reaction (HER) is one in which hydrogen gas (H_2) is synthesized from electrolysis-split water molecules. A catalyst is usually required for this process; one such proven catalyst is molybdenum sulfide. This fact, alongside the reality that MoS_x is a bulk material where the catalytic site exists only on the surfaces, inspired the idea to place MoS_2 groups onto molecules. This new catalyst would facilitate the HER and would increase the aggregate surface area where catalytic sites are present, thereby increasing efficiency. It has been proven that changing the ligands on the molybdenum sulfide, the arrangement of different layers, the surface features, and impurities of the material can controllably alter electrocatalytic properties. The molecules synthesized in this research contain ligands that are picolinic acid derivatives with substituents of unique electronegativities and proton-donating abilities, and their capacities to function as HER catalysts were examined via cyclic voltammetry. Five substituents were studied: -H, -OH, -OMe, -F, & -CF3. So far, data has been collected for -H, -F, & -CF3 and it has been shown that increasing the electronegativity and the number of electronegative atoms improve catalytic performance. The rest of the catalysts must still be examined.

Lotic algae community composition and response to disturbance in mid-order rivers
Presenter: Alex Desjardins
Faculty Mentor: Dr. Jessica Schedlbauer
Department: Biology

Human induced environmental effects have increased the frequency of algal blooms in rivers, which significantly impair these ecosystems and are damaging to humans. To better understand algae that cause harmful blooms, recent research has separated river algae into two communities based on their habitat: algae living in the water column or at the bed of a river. How these communities' composition differs, and how they may differentially affect ecosystem function is poorly understood. This project investigated these problems in two ways. First, community composition was studied by analyzing the communities' species richness and family relative diversity at base flow. This was accomplished using DNA analyses in three watersheds. Second, the community function of water column algae was studied at base flow and during rain events (high flow), when algae from the riverbed entered the water column. This was done in two rivers with an experiment examining rates of ecosystem productivity. Analysis of community composition revealed significant differences in species richness and family relative diversity between the two algal communities, highlighting their disparateness at base flow. Ecosystem productivity results were varied, with net ecosystem productivity (NEP) significantly decreasing from upstream to downstream locations in only one river. However, NEP did not vary significantly between base and high flow, suggesting that riverbed algae may not significantly alter ecosystem function at high flow. Although community composition differed between algal communities, further research is necessary to better quantify their effects on ecosystem function, as sample site-specific characteristics may have confounded the reported findings.

Perceptions of Mindfulness Practices in Relation to Academic Stress Among Secondary Students
Presenters: Dr. Elizabeth Dlugolecki, Dr. Bridget Asempapa, Kelly Davis
Departments: K-12 Health and Physical Education, Counselor Education

Background: Academic stress can be debilitating for any age, but significantly for adolescents. With recent increases in stress related to the global pandemic, it is imperative to understand the influence of mindfulness exercises on students' academic stress. Purpose: In this study, we incorporate four mindfulness strategies into a high school stress management curriculum and examine their influence on students' academic stress. Methodology: Twenty high school students were introduced to one mindfulness exercise (exercises included guided meditation, coloring and drawing, yoga, and clay molding) each week for a duration of 4 weeks. The data collected included weekly student reflections, pre- and post-student surveys, and study artifacts. Responses were analyzed to identify themes. Findings/Conclusion: Results showed two emergent themes: effective therapeutic tools and dissatisfaction/hindrances to growth. The participants feedback showed that engagement in mindful activities can be effective for stress reduction. The most preferred mindfulness interventions were guided meditation followed by clay molding, coloring, and yoga. Implications: Mindfulness techniques incorporated in high school curriculum have a positive impact on academic stress. Teaching mindfulness exercises can positively influence academics, school culture, and most importantly, students' mental health. K-12 educators seeking to incorporate developmentally appropriate mindfulness techniques must do so considering students needs.
Keywords: academic stress, high school students, mindfulness

Are They Still Playing Favorites? A Reality Check on Redfin's Commitment to Equity Through Geospatial Analysis of Real Estate Services
Presenter: Isaac Gabriel
Faculty Mentor: Dr. Jongwoong Kim
Department: Geography & Planning

This study aims to examine whether Redfin's real estate services display ongoing discriminatory patterns almost two years after their agreement with the National Fair Housing Alliance. Using Geographic Information Systems (GIS), a series of active listings data from Redfin will be collected and analyzed from February to April 2024 to uncover patterns of service distribution across urban areas.
Exploratory spatial data analysis and spatial autocorrelation techniques such as Moran's I are used to visualize and quantify the extent of service clustering dynamics across neighborhoods. Additionally, Ordinary Least Squares (OLS) regression is used to uncover correlations between the level of service provided and socioeconomic factors such as race and income at hyperlocal levels, with the addition of spatial weights to account for geographical influences
The core hypothesis explores whether, despite policy changes, Redfin's services might still be unevenly distributed, particularly disadvantaging racial minorities and those in lower-income residents. Using numerous geospatial methods, the research aims to produce a detailed picture of how and where these service gaps exist. This inquiry is not just academic; it aims to shed light on the real-world implications of digital real estate services, contributing to a broader understanding of equity in housing access. The findings from this study are anticipated to offer valuable insights into the efficacy of Redfin's policy adjustments, informing ongoing discussions among policymakers and industry stakeholders about the need for fair and inclusive real estate practices. The findings aim to contribute to the development of more equitable service models in the digital age.

The Thomas Sisters: Citizen Scientists of the 19th Century
Presenter: Dariana Garcia-Bernabe
Faculty mentor: Dr. Rodney Mader
Department: English

Authors of botany books directed towards women pushed a perspective of botany that involved it with domestic responsibilities and attitudes. Almira Phelps, one of the most recognizable botany authors, agreed with the domestic ideals, but in her manual Familiar Lectures on Botany (1829) she incorporated science like plant classification and religion into botany. While the plant classification was made up of simple classification methods it was still valuable to the development of knowledge. Sisters Gulielma and Mary Louisa Thomas lived in Rocky Hill, East Goshen; they used botany to learn about their surroundings and connect with nature. Their collection of 1,000 plant specimens is a testament to their excitement and commitment to botany. Today the collection can be useful in the field of environmental changes to specific plant specimens. Collecting and classifying plant specimens allowed for young women to learn about nature, to build community, and to have a voice. The research methods used were genealogy, historical research, and humanities methods. Even though botany was experienced in a restrictive way that limited the amount of science learned, it was still fundamental to the development of knowledge in young women. It even opens the doors to look at the past through primary sources as seen in Thomas' collection of 1,000 plant specimens. The collection can be fundamental in looking at environmental changes; these young women leave behind their enthusiasm and dedication to knowledge.

Racial-Ethnic Match in Relation to Cortisol Levels for Children in Head Start Preschool
Presenter: Izabell Hearst
Faculty Mentor: Dr. Eleanor Brown
Department: Psychology

Teacher-child racial-ethnic match has been demonstrated to relate to academic and social-emotional outcomes (Garner et al., 2021 & Rasheed et al., 2020), but no studies to date have examined the relation to stress levels in educational context. Young children facing economic hardship are disproportionately likely to be exposed to chronic environmental stressors and often show elevated levels of the stress hormone cortisol (Blair et al., 2011), which can undermine the functioning and development of brain areas involved in learning and emotion regulation (McEwen, 2013). The present study examines teacher-child racial-ethnic match in relation to cortisol levels for children attending Head Start preschool. Participants were 75 children ages 3 to 5 years old. Cortisol was measured via salivary assay at 4 times of day on 6 different days, allowing for assessment of stress levels when children were attending not only regular early learning or homeroom classes with a lead and assistant teacher but also music, dance, and visual arts classes with different lead teachers. Implications concern understanding the impact of teacher-child racial-ethnic match within a key intervention program designed to counter the impact of poverty risks.

Identifying Contributing Factors in Wrongful Convictions
Presenter: Abigayl Heller
Faculty Mentor: Dr. Jane Tucker
Department: Business & Public Management

This research study is aimed to identify the contributing factors in wrongful convictions. The study is conducted using secondary data from the University of Michigan's database of exonerations. This specific study is focused primarily on exoneration data in the state of Pennsylvania that was reported through the University of Michigan. The study contains 125 cases and identifies the reasons it was believed a wrongful conviction occurred. This study will help identify the most prevalent reasons these convictions occur and if it has to do with the type of crime, age of the offender, and race, along with the case itself and factors that could have contributed during investigations. The results of this study can be used to identify specific areas in the criminal justice system that could use improvements. This study is currently being conducted and findings will be available at the study's conclusion.

Workplace cooperation attitudes among federal employees across the COVID-19 pandemic years
Presenter: Grace-Lisa Ilunga
Faculty Mentor: Dr. Sabina Samipour-Biel
Department: Psychology

The COVID-19 pandemic caused long-term impacts across organizations, including federal agencies. This study examines attitudes about workplace cooperation before and after the pandemic. Data from1,222,041 civilian and military federal employees (FEs) was collected by the Office of Personnel Management via the annual Federal Employee Viewpoint Survey (FEVS) in 2019 and 2023. We predicted that civilian and military FEs' experiences differed throughout the pandemic years, such that civilian FEs will have improved attitudes about cooperation at work between 2019 and 2023, while the military FEs will have diminished attitudes about cooperation at work over the same timeframe. We draw from evidence that the pandemic has created unexpected opportunities for innovation within the civilian sector (Frenk et al., 2022), while military branches continue to report challenges related to post-pandemic recruiting (Black, 2023; Lawrence, 2020; Maucione, 2022). We tested the interaction between the military and civilian FEs' attitudes about workplace cooperation across 2019 and 2023 using a two-factor Analysis of Variance. Contradictory to our hypothesis, the results indicated that the military employees' attitudes about workplace cooperation improved more than the civilian employees', which also improved from 2019 to 2023. However, the very small effect size indicates that the pattern is likely not meaningful (eta-squared = .0000206). Overall, the FEVS survey results seem to indicate attitudes about cooperation among FEs, whether military or civilian, remain similar before and after the pandemic. This finding is encouraging as it provides evidence that the pandemic does not seem to have deteriorated FEs'attitudes regarding cooperation at work.

Peace and Justice Journeys: Experiential Learning and Social Justice
Presenter: Dr. Dean Johnson
Department: Philosophy

My goal is to create experiences rooted in the history/peoples of this region exposing whitewashed histories and displacing colonial- and white-centered narratives. These journeys are to places with a social justice or moral significance providing a transformative experience and making course materials more concrete for students. Students engage in readings, other course materials, and conversations prior to visiting a place. Course materials center, whenever possible, the stories, experience and wisdom of BIPOC communities. The power of visiting places makes the events, people, and history feel more real.

Sensory evaluation study of three high-calorie drinks aimed at people with low Body Mass Indexes
Presenters: Parisa Karimzadeh, Julia Carroll, Hossein Vojoudi
Faculty mentor: Dr. Amir Golmohamadi
Department: Nutrition

Approximately 1.6% of American adults (5.3 million) are underweight (UW), with a BMI of 18.5. Underweight individuals often consume commercially high-calorie foods and beverages to boost calories in their diet. These products are not nutritionally balanced and UWs often develop an aversion to these products, and there is no unbiased data on consumer acceptance of these products.

This study aimed to evaluate the acceptability of three samples of commercial high-calorie drinks (HDs) among WCU students through sensory evaluation. Food samples included one high-calorie vegan drink (HD-V) and two regular drinks (HD-R1 and HD-R2).

A convenience sample of 35 students from the WCU campus participated in a 20-minute session in the sensory evaluation laboratory of the nutrition department. Using a 9-point hedonic scale, participants evaluated HDs (1oz). Demographics, descriptive, taste, texture, aftertaste, and overall acceptance data were collected by Redjade software.

Participants (97%) were between 18 and 24 years old, with a gender distribution of 58% males and 42% females. For all attributes, HD-V samples had the lowest mean values ($p<0.05$) in the ratings for aroma (5.23), texture (5.4), taste (4.03), aftertaste (3.6), and overall acceptance (4.3). There was no significant ($p<0.05$) difference between the sensory attributes of HD-R1 and HD-R2 samples. Across all three samples, aftertaste received the lowest rating. Several participants reported the artificial aftertaste of the samples.

The findings indicate that high-calorie drinks, particularly vegan drinks, should be improved in formulation and taste to increase consumer acceptability. Nutrition professionals should find alternative interventions or adjust prescription levels of HDs.

Microbial Antics: Unveiling the Unseen World of ant Aphaenogaster rudis
Presenter: Lily Kelleher
Faculty mentor: Dr. Manuela Ramalho
Department: Biology

There are currently over 17,000 described species of ants with a world wide distribution. Due to the high diversity between species, ants are considered vital keystone species to many ecosystems. They provide basic ecosystem services such as: seed dispersal, soil bioturbation, decomposition and pest control. Within these ecosystems ants form complex symbiotic relationships with plants, fungi and bacteria. However these symbiosis remain largely unstudied in terms of the microbiome. A microbiome is a grouping of microscopic organisms, such as bacteria, archaea, protists and nematodes, in a singular environment. Studying the interaction between ants and their microbiome is important because of the crucial role that microbes play in the overall health of the ants. Aphaenogaster rudis, which is a native North American ant species, remains entirely unstudied in terms of their microbiome, more precisely their bacterial community. This study aims to determine the taxonomic composition and abundance of the Aphaenogaster rudis bacterial community and to determine if this association impacts the fitness of these insects. For this study, ants from several colonies were collected from the Gordon Natural Area in West Chester, Pennsylvania, USA. DNA was then extracted from the ants in all stages of development and the 16S rRNA gene was amplified and sequencing following the NGS amplicon approach.. The findings from this study are novel and this information can be used to help better understand ant-microbe interactions.

Understanding Contributors to and Effects of Underdiagnosis of Autism in Females with Normal IQ: A Narrative Review
Presenter: Haley Lebermann
Faculty Mentor: Dr. Reva Zimmerman
Department: Communication Sciences & Disorders

Females with autism spectrum disorder (ASD) and average or above-average IQ often go undiagnosed or misdiagnosed, or they receive their diagnoses later in life, relative to their male counterparts. This diagnostic gap in female ASD diagnosis is evident in the current male-to-female ratio, such that males are four times more likely to be diagnosed than females. However, several studies have suggested that the established sex ratio is not representative of the true ASD population, meaning that many girls with ASD may not be identified as such. Without a diagnosis, these individuals are deprived of the services, interventions, and supports they may need to be successful in their social and academic endeavors. To better understand the complexities of the under- and misdiagnosis of girls with ASD, especially in school settings, we conducted a narrative review of the literature to determine (1) what behavioral differences exist between school-aged males and females with ASD, (2) how these differences might contribute to the diagnostic gender gap, and (3) what impact the diagnostic gender gap has on the lives of females with undiagnosed ASD. Results will be discussed in the context of improving identification and service provision for girls with ASD.

Inclusion of Peer Leaders in an Exploratory FYE Course
Presenters: Dr. Courtney Lloyd, Michelle Blake, Dr. Ann Colgan
Department: Exploratory Studies Academic Advising, English, Exploratory Studies Academic Advising

Despite research that shows that First-Year Experience (FYE) courses enhance student success and retention, FYE Exploratory sections were experiencing challenges including concerning rates of class attendance, assignment submission, and student engagement, as well as strong negative student perceptions of the course's value. Drawing on research indicating the significant influence of peers on first-year student perceptions and behaviors, this PRG-funded project assessed the impact of integrating experienced peers as peer leaders (PLs) into one of the two Exploratory FYE sections at WCU. The investigators hypothesized that PLs would serve as role models and provide academic support to students; would ease their transition to university life; would facilitate communication between students and faculty; and would develop communication and campus leadership skills themselves. Using quantitative and qualitative assessments, we learned that the PLs had small positive effects on attendance, grades, and on-time assignment submission rates, but a noticeable effect on student engagement. Instructors benefited from the PL involvement by learning about pressure points in their lessons and assignments from a student perspective. We did not see growth in the PLs' leadership and communication skills, suggesting that increased training and professional development of the PLs is needed. In short, the experiment suggests that the inclusion of PLs in Exploratory sections of FYE can have a positive effect on FYE students, PLs, and instructors, though a bolstering of the PL programming would increase the positive benefits for PLs.

Stimulation to Increase Readiness for Interprofessional Learning Between PA and EMS Students
Presenters: Professor Laura Lonergan, Professor Patrick Heagey
Department: Physician Assistant, Sports Medicine

This research provides a novel example of ways to effectively incorporate community pre-hospital providers and physician assistant students into an interprofessional simulation event which could be replicated in other programs. This interprofessional education (IPE) event effectively increased students' willingness to engage in IPE, improved communication between prehospital EMT-B and EMT-P students and physician assistant students, and increased student knowledge of the scope of practice of providers involved in the care of acutely ill patients who initially present to EMS and then require emergency department care. This simulation event was incorporated into the PA students' Emergent and Surgical Medicine didactic course at West Chester University's PA Program.

Remote Sensing and Community Archaeology at the Historic Coopers Farm Cemetery
Presenter: Allison Magerr
Faculty Mentor: Dr. Heather Wholey
Department: Anthropology and Sociology

This project involved working with the Friends of Coopers Farm Cemetery Association on a community engaged archaeology project. The purpose was to document the location of possible unmarked graves in Coopers Farm Cemetery in Kent County, DE and integrate those locations into a comprehensive cemetery map that includes marked grave locations. Known marked grave locations were recorded using a handheld GPS unit. There are a total of 98 marked graves, the earliest dating to 1828 and the latest to 1934. A GSSI ground penetrating radar (GPR) instrument was used to survey three grids, the first two 50 x 50 ft and the third 60 x 60 ft. Data was collected along one foot transects within those grids to reveal subsurface anomalies potentially indicating the location of unmarked graves. The GPR survey data was processed using RADAN 7 software. Analysis of the survey data indicates at least 45 unmarked graves within the three grids. This data was input into ArcGIS to create an online map that can be queried for spatio-temporal patterning and help document the evolution of the cemetery over time. An ArcGIS StoryMap was created to make the research and comprehensive map accessible to community members. The Friends of Cooper Cemetery Association will be able to use this map to study community family burial histories, be able to mark the newly identified unmarked graves and use the outcomes as support to apply for additional funding for cemetery preservation.

Developing Preservice Teachers' Cultural Competence with Children's Literature
Presenters: Katelyn Manwiller, Professor Daris McInnis, Dr. David Barry
Departments: University Libraries, Literacy, Early and Middle Grades Education

Teacher education in our state currently faces two competing realities: the adoption of new Culturally Relevant Competencies for preservice teachers and increased scrutiny over diversity and representation in pedagogy. The current climate presents a challenging dichotomy for preservice teachers preparing to enter the workforce. They must know how to recognize and encourage diversity in their classrooms while also walking the fine line of not angering parents or administrators. To assist our preservice teachers with fulfilling the Culturally Relevant Competencies and prepare them for the complexities of the current educational landscape, the researchers established a paid undergraduate research fellowship for underrepresented Early Grades Prep majors to critically examine and develop pedagogical inclusion criteria for diverse representation in children's literature. Employing a case study methodology, we explored fellowship participants' experiences analyzing and reflecting upon racial and ethnic identity, gender, sexuality, and disability in children's literature. We demonstrate the culmination of those experiences through the student capstone project completed during the fellowship. This project allows students to showcase their mastery of required CR-SE competencies in relation to analyzing children's literature and serves as a portfolio piece for current and future employment. Findings underscored participants' journeys from reflection to advocacy and we will invite current and past fellows to attend our poster session to share their experiences firsthand. The study concludes with questions for future research and enhancing teacher preparation courses, particularly regarding disabilities.

Who knows what? An agent based simulation of overhearing in teams
Presenter: Taylor McCrossan
Faculty Mentor: Dr. Sabina Samipour-Biel
Department: Psychology

While the term is unknown to most people, Transactive Memory Systems (TMS) are a mechanism through which teams of experts (e.g., surgical teams, military teams, etc.) are able to combine their unique areas of expertise to accomplish their shared goals. To develop a TMS, team members must first learn who on the team has what expertise (Peltokorpi, 2008), and together develop a "shared knowledge directory"(SKD). Meanwhile, modern technology has changed the ways that team members can work together and communicate with each other. This research examined how the process of SKD development is impacted by team members' ability to "overhear" each other's conversations when they purposefully seek information from another team member (e.g., teams working in a shared space versus remote teams). We used agent-based computational modeling with the program R Studio to simulate 240 teams communicating under eight specific conditions. Each team was allowed to engage in 100 communication instances and the differences between the resulting SKDs were analyzed using Aligned Rank Transformation Analysis of Variance. Contradictory to our expectations, when agents on the same team had some overlap in their knowledge (making it more challenging to figure out who is an expert at what), the ability to "overhear" each other even when the information shared was inaccurate still resulted in better SKD development compared to not being able to "overhear" each other's conversations at all. This study reveals an unexpected possible downside of team members getting to know each other through one-on-one interactions rather than full-group interactions.

Mental Health Experiences in Patients with Guillain-Barré Syndrome
Presenter: Julianna Miller
Faculty Mentor: Dr. Reva Zimmerman
Department: Communication Sciences & Disorders

Guillain-Barré Syndrome (GBS) is a rare autoimmune disorder in which a person's immune system damages the peripheral nervous system, causing muscle weakness, numbness or tingling, coordination problems, paralysis, difficulty swallowing and speaking, and respiratory issues (World Health Organization, n.d.). Paresis and paralysis can make it challenging for patients to carry out activities of daily living such as eating, communicating, or more complex activities such as working. These physical impairments can lead to substantial mental health issues, such as anxiety or depression, in those living with the disorder. Because depression and other mood disorders can impede recovery (Blochl, 2019), patients should seek help immediately to prevent clinical depression. Unfortunately, most mental health services are conducted using verbal communication, creating an additional barrier to treatment for those who lose the ability to speak (Hillyar & Nibber, 2020). Understanding the complex interplay of contributors to mental health concerns and barriers to mental healthcare in GBS is important for both healthcare providers and patients to facilitate effective care. However, very little research investigates the impact of communication impairment on individuals with GBS and their mental health. Thus, the purpose of this pilot study is to explore the effect of communication impairment on mental health in individuals with GBS. Using qualitative methodology, we seek to collect first-hand accounts of the challenges people with GBS-linked communication problems have experienced in accessing and benefiting from mental healthcare. This research is an important first step in understanding the psychosocial impacts of GBS on patients and their families.

Effects of Alcohol and Nicotine Exposure via E-Cigarettes on Metabolic Enzymes in the Liver
Presenters: Ilyas Muqbel, Nicole Graumann
Faculty Mentor: Dr. Kristen Breit
Department: Psychology

Alcohol and nicotine are commonly co-consumed among pregnant people, and each drug may lead to physical and behavioral changes in offspring. Co-consumption rates have increased due to the increasing popularity of electronic cigarettes (e-cigarettes) which raise nicotine levels more than traditional cigarettes. Importantly, co-consumption of alcohol and nicotine via e-cigarettes may alter drug metabolism, which may lead to potential risks in liver functioning and increased rates of substance use disorders. These variables are difficult to collect in humans, which makes rodent models advantageous. This study used a mouse model to examine how combined developmental exposure to alcohol and nicotine may alter metabolic enzyme presence in offspring. Maternal mice and their neonates were exposed to moderate levels of alcohol (1% air concentration), nicotine via e-cigarettes (18 mg/mL), the combination, or the e-cigarette vehicle daily during the third trimester brain growth spurt. Later in adolescence, offspring liver samples were homogenized to measure alcohol dehydrogenase (ADH), CYP2E1, and CYP2A6 via western blots as well as serum triglyceride levels via a colorimetric assay. Preliminary results suggest early development combined exposure increased ADH levels compared to single drug or no exposure. In contrast, only developmental nicotine exposure increased serum triglyceride levels compared to controls. Nicotine metabolites are still being analyzed. This data will provide valuable information regarding whether combined prenatal alcohol and nicotine exposure may increase one's risk of developing negative health consequences and/or substance use disorders.

Prenatal Alcohol and Nicotine Exposure via E-Cigarettes on Sensorimotor Development in Rats
Presenter: Sydney Newman
Faculty Mentor: Dr. Kristen Breit
Department: Psychology

Alcohol and nicotine are the two most commonly consumed substances among pregnant people. Prenatal exposure to alcohol or nicotine alone is associated with impaired early motor development. The popularity of electronic cigarettes has risen among pregnant people since they are assumed to be safer than traditional cigarettes; however, it is unclear whether prenatal e-cigarette exposure elicits the same developmental impairments. Furthermore, alcohol and nicotine are commonly co-consumed among pregnant people, yet it is unknown whether co-exposure exacerbates impaired motor development. Rodent models are ideal for teratology research because they allow for quick data collection and translate to clinical populations. Using a rat model, this study examined the effects of combined prenatal alcohol and nicotine e-cigarette exposure on early sensorimotor development in offspring. Pregnant dams were exposed to moderate levels of alcohol, nicotine, the combination, or a vehicle once daily from gestational days 5-20, which mimics the human first and second trimesters. After birth, one sex pair from each litter was assessed on a grip strength and hindlimb coordination task from postnatal days 12-20, mimicking early childhood. Preliminary results suggest that prenatal alcohol exposure alone impaired sensorimotor development. Subjects exposed to only prenatal alcohol required more days to achieve a successful trial and had fewer successes by the end of the paradigm. Additional data are still being collected and analyzed. These data will help inform the public about the potential effects on motor development resulting from prenatal nicotine exposure via e-cigarettes alone or in combination with alcohol.

Nanodrop method for quantification of Orsay virus particle concentration
Presenter: Jay Ni
Faculty Mentor: Dr. Jessica Sowa
Department: Biology

The natural infection of C. elegans by Orsay Virus supports the study of host-pathogen interactions in Caenorhabditis species. Knowledge of viral concentration in experiments involving viral infection is necessary for standardization of further downstream processes. Typical assays for virus particle quantification utilize quantitative polymerase chain reaction (qPCR) to amplify viral DNA/RNA for quantification by. We pursued a different approach to purify and quantify viral particles using the positive-sense RNA virus, Orsay Virus. Our approach features the Thermo Scientific NanoDrop OneC Microvolume Spectrophotometer as an alternative to virus quantification by qRT-PCR and other assays.Â
We have developed a virus prep and purification protocol using an ammonium sulfate precipitation method and Capto Core 700 chromatography beads. The NanoDrop spectrophotometer is utilized to record measurements of protein quantitation with Modified Lowry Assays. Our data is used to determine the viral particle constant and extinction coefficient of Orsay Virus as those values are directly related to protein concentration. A qRT-PCR standard curve of Orsay RNA1 is used for virus quantification. The data from the NanoDrop spectrophotometer will be compared to qRT-PCR assay of viral particle samples. We predict that our UV absorbance method of virus quantification will be an attractive alternative to qRT-PCR and will present the results of the comparison of our spectrometry method versus qRT-PCR.Â

Domestic Violence Center of Chester County Education Program
Presenter: Isabella Nimmerichter
Faculty Mentor: Dr. Matt Saboe
Department: Economics and Finance

Dating Violence is exceptionally prevalent among young adults. Dating violence includes physical, emotional, sexual, verbal abuse, and stalking. Implementing intervention and prevention tools within higher education is critical to teach young adults the warning signs of dating violence and where they can receive help.

This study implemented a 2-session dating violence prevention program developed by the Domestic Violence Center of Chester County in Honors 100; a first-year course taken by all new honors students. We administered a pre-and post-survey to compare learning objectives before and after the education program. Specifically, we focused on recognizing relationship abuse, supporting others who have experienced abuse, finding resources to help themselves or others, identifying red flags in relationships, and understanding how to proceed in an abusive relationship.

Preliminary analysis has revealed that 33% of participants responded that they knew where they could go if they were experiencing dating abuse in the pre-survey. This number increased to 86% in the post-survey after the completion of the education program. Full statistical analysis is currently ongoing and will potentially reveal additional insights into the importance of domestic violence education.

Trends in Mental Health Status and Service Utilization among International Students in the United States: Findings from the Health Minds Survey 2017- 2022
Presenter: John Omole-Matthew
Faculty Mentor: Dr. Zeinab Baba
Department: Health

Purpose: To examine the trends of Mental health status and Utilization among international students enrolled in Colleges in the United States from 2017- 2022.

Design : A cross sectional analysis data collected from the Health Mind Survey between 2017 and 2022.

Motivation & Transformation: Delving into the Subject of Fans and Fandom Participation
Presenters: Julian Padillo, Abigail Chipps
Faculty Mentor: Dr. Julia Waddell
Department: Communication & Media

Fandom culture has developed into a dynamic facet of the online space. In the digital age, accessibility allows individuals to foster both community and identity in spite of physical distance and language barriers. Through the lens of social identity theory and uses and gratifications theory, analysis of fandom participation will be conducted: delving into the how and why behind an individual's self-identification as a fan, as well as the impact of fandom on one's social identity. Social identity theory suggests that self-categorisation, particularly of the personal and social self, is what comprises an individual's identity (Tajfel & Turner, 1979). Furthermore, according to Katz, Blumler, and Gurevitch (1973), uses and gratifications theory attempts "to explain something of the way in which individuals use communications, among other resources in their environment, to satisfy their needs and to achieve their goals" (p. 511). Utilizing uses and gratifications theory as a framework of analysis will give more context to the motivations of participation in fandom. Along that same line, the application of social identity theory will foster connections between the individual and their fandom. Through a systematic overview, and taking both aforementioned theories into account during analysis, we predict a cyclical, compounding relationship between the significance of a fandom to a fan's social identity and their pursuit of need fulfillment and goal achievement, and as well, predict that said pursuit influences their social identity in turn.

Assessing the dynamics of plastic waste in southeastern PA streams
Presenter: Gianna Parrish
Faculty Mentor: Dr. Megan Fork
Department: Biology

Our research project seeks to evaluate the efficacy of single-use plastic bans on preventing contamination of stream ecosystems. I will present on the methodology that I am currently learning and applying in my spring 2024 SURF project. We are collecting human debris from nine streams: 3 with bans in place >1 year, 3 with bans implemented in January 2024, and 3 with no bans. At each site, we collect all human debris within four 5m by 5m plots, then clean, measure, and categorize each item by material composition and usage. In addition to communicating the methodology, we will be providing visualizations of the data we have collected so far. With this research, we hope to contribute to scientific understanding of human impacts on streams and inform policymakers and stakeholders about decisions regarding single-use plastic bans.

Source matters: An examination of the impact of students' beliefs on their memory for the source of controversial news
Presenters: Alexis Partridge, Kylie Hoffman
Faculty Mentor: Dr. Karen Mitchell
Department: Psychology

Source memory is our ability to remember where information came from. Stereotypes and beliefs influence source memory. We are interested in whether someone's beliefs about a controversial topic (e.g., gun rights) impacts their memory for the source of news. For example, someone who strongly believes in second amendment rights and perceives Fox News as a highly credible, right-leaning/conservative news source may attribute a news story about the importance of protecting second amendment rights to Fox News (rather than CNN), because they come to remember that the "more credible" source delivered a story that aligns with their beliefs about gun rights. This would not be problematic if the story really did come from Fox News. But, if the story actually came from CNN, this would lead to a source memory error (false memory) for the source of the story. Such cognitive errors can sustain fake news. To characterize our sample, we surveyed WCU undergraduates about things like political and religious affiliation, as well as their impressions of various news sources (e.g., familiarity, credibility). With a different sample of students, we asked to which of two stereotypical news sources (Fox News, CNN) students attribute controversial stories (e.g., would Fox News be more likely to be associated with a story about second amendment rights or sensible gun control). We will present data from this preliminary work and outline our design for a source memory experiment that explores how students' beliefs may create false memories for where they get controversial news.

Impact of Wolbachia symbiosis in Pheidole
Presenter: Emily Pisiechko
Faculty Mentor: Dr. Manuela Ramalho
Department: Biology

The intense biodiversity of the endosymbiont Wolbachia is an integral part of the microbiome of Pheidole. Understanding the ways in which Wolbachia is diverse could perpetuate and promote the growth of more diversity in Pheidole. Wolbachia is a key part of the microbiome of Pheidole; supplementing this ant family with amino acids necessary for growth that it would not normally consume from food alone. It is hypothesized that this endosymbiont impacts the behavior of these ants, along with furthering speciation. Wolbachia also has 18 supergroups, but only a small number of these are present in the microbiota of Pheidole. Separating the infections of Wolbachia from the genetic samples from Pheidole using Multilocus Sequence Typing, targeting a combination of genes commonly present in Wolbachia, would provide information if there was a single infection or not. Identifying a single infection would enable us to identify what supergroup Wolbachia belongs to. Prior research supports the idea that there are relatively high amounts of variation of Wolbachia within supergroups, even within organisms that are in the same family and genus. This would lead us to the expectation that Wolbachia could be a driving factor for evolution.

How do the Orsay virus and its variants affect the Intracellular Pathogen Response in C. elegans?
Presenter: Abigail Reese
Faculty Mentor: Dr. Jessica Sowa
Department: Biology

In 2011, the Orsay virus was discovered as the first virus known to naturally infect C. elegans. This is a ssRNA, non-enveloped, +sense virus that contains 4 proteins including capsid, alpha-delta, delta, and RDRP. Infection of C. elegans by this virus activates an innate immune response called the Intracellular Pathogen Response (IPR), which is a set of 80 genes that are transcriptionally upregulated. This response can also be triggered by heat, stress, other intracellular pathogens, or Bortezomib. Bortezomib is a chemotherapy drug that activates the C. elegans IPR when exposed, and preliminary data from our lab indicates that when worms are exposed to Bortezomib and the Orsay virus, the IPR levels decrease relative to Bortezomib exposure alone. This suggests that the IPR is lessened when the worms are infected with the Orsay virus.
Our current study seeks to understand how the Orsay virus affects the IPR in C. elegans. Evidence suggests that the Orsay virus dampens the IPR, so we are interested in determining which of the 4 Orsay proteins is responsible for this. Previous evidence has shown that the RDPR upregulates the IPR, not represses it, so we created transgenic strains that can be used to test the capsid, alpha-delta, and delta proteins individually. We are also investigating how variation in the virus affects the IPR by comparing infection rates in different Orsay variants. Our data indicates that divergent Orsay variants V2 and V13 show lower infectivity rates, and we are also assessing the effect of these variants on the IPR. Overall, our results add to our knowledge of how this virus interacts with its' host, helping to guide and expand the use of C. elegans as a model organism for host-virus interactions.

Algorithmic Approaches for Object Tracking and Facial Detection Using Drones
Presenters: Kareem Shahatta, Peter Savarese, Gina Egitto
Faculty Mentor: Dr. Jongwook Kim
Department: Computer Science

Drones are unmanned aerial vehicles that have a variety of uses in many fields such as package delivery and search operations. Tello is a small, programmable drone designed for educational purposes. We developed algorithms using DJI Tello Py, an open-source Application Programming Interface, to command the movements of Tello for tracking a target object (i.e., human). Our algorithms utilize digital image processing techniques on Tello's live video stream to optimize the number of movements Tello needs to reach its target. Our poster presentation will explain our approaches to implement object-tracking and facial detection for Tello, discuss lessons we learned, and highlight improvements for future work.

Nurse Initiated Sepsis Protocol in the Emergency Department Setting
Presenter: Madilyn Siuta
Faculty Mentor: Dr. Michelle Kaulback
Department: Nursing

Sepsis affects hundreds of millions of patients across the world within various healthcare settings. Sepsis protocols vary between health systems and institutions which can lead to the lack of prompt client intervention. Each one hour delay in administration of antibiotics is associated with an 8% decrease in survival (Rhodes et al., 2017). The vision for this project is to explore the potential benefits of implementing a standardized national sepsis protocol. For this EBP project a PICO question was formulated. In adult patients presenting to the emergency room with suspected sepsis, how does a standardized international nurse lead sepsis screening protocol, compared to protocols that vary by hospital system, promote early identification of sepsis. To address the PICO question, an exhaustive search of the literature was completed and three (3) articles were selected utilizing the level of evidence pyramid. A synthesis of the literature and recommendations for future practice were initiated. A review of the evidence led to the inclusion of the Surviving Sepsis Campaign app in all hospital phones and computers. This will provide a condensed space with a sepsis screening tool, lab results, and pop up notifications to various specialties such as pharmacy and physicians. Collaborative care plays a pivotal role in expediting the identification of sepsis and enhancing patient outcomes.

Student Perceptions of Clinical Readiness are Increased with Integration of Simulation
Presenter: Dr. Kasey Trill
Department: Nursing

Purpose:
The purpose of this study was to increase first-semester, HBCU nursing student's simulation exposure by 50% using the ATI education platform and measure student perceptions of readiness for clinical rotations.
Introduction:
This study addressed the research gap of simulation in beginning nursing courses and the impact on student perceptions of self-efficacy in future clinical rotations and contributes to the larger body of simulation research by answering the following questions:
1.   What are student perceptions regarding simulation and clinical readiness?
2.   How does exposure to simulation impact student clinical performance outcomes?
3.   To what degree does student exposure to simulation, via ATI, increase student clinical pass rates?
Methodology:
This non-equivalent, quasi-experimental, and quantitative two-year study examined first-year nursing students' perceptions on simulation and clinical readiness at a national Historically Black College and University (HBCU). The survey employed referenced the International Nursing Association for Clinical Simulation and Learning (INACSL) and the National League for Nursing/Jeffries Simulation Theory guidelines. Cronbach's Alpha was conducted to evaluate the reliability of the survey scale and was found to have a reliability coefficient of $\alpha = .88$. HBCUs play a lead role in preparing skilled graduates to aid in the nursing shortage and meeting the National Institute of Medicine's (NIM) strategic plan for promoting a diverse healthcare workforce. The existing curriculum for a Nursing Fundamentals course was enhanced by increasing integration of simulation with ATI-supported resources and implementing the survey tool.
Evaluation:
SPSS data analysis showed that 87% of students felt that simulation prepared them for clinical experiences and that students would benefit from additional simulation courses. The study suggested that simulation can increase student clinical pass rates, but further investigation on the impact on didactic learning and NCLEX pass rates is needed.

The Effect of Activation Dynamics on the Muscle-Tendon Unit's Ability to Decelerate Mass
Presenter: Rajal Vyas
Faculty Mentor: Dr. Michael Rosario
Department: Biology

Muscle-tendon units (MTUs) play a crucial role not only in accelerating mass, such as generating propulsive power during jumping, but also in the equally important task of decelerating mass, absorbing impact during landing. The dynamic energy flow between muscles and tendons during these decelerations, particularly in anticipated or reactionary responses, remains poorly understood. In anticipated responses, muscles pre-contract to halt the decelerating mass, while in reactionary responses, muscle activation occurs gradually in response to the deceleration. The time to maximal muscle activation varies from instantaneous to up to 30 ms, raising the question of how activation dynamics influence the muscle's role in mass deceleration. This study employs a muscle-tendon simulation to model a mass-spring system, simulating a falling mass decelerated by an MTU. Simulations vary muscle activation dynamics, representing both anticipated and reactionary responses. Results demonstrate that in a reactionary response, work is done on the muscles, whereas in an anticipated response, the muscle performs work before any external force acts on it. These findings underscore the significance of activation dynamics in shaping the functional role of muscles during mass deceleration, shedding light on the mechanisms governing energy flow within the MTU.

Effects of Co-Exposure to Alcohol and Nicotine on Maternal Blood Levels and Offspring Developmental Milestones in Mice
Presenter: Kaile Wanamaker
Faculty Mentor: Dr. Kristen Breit
Department: Psychology

Both prenatal alcohol and nicotine exposure are separately associated with developmental and physical delays. Importantly, alcohol and nicotine are commonly co-consumed, including by pregnant people. Co-consumption of alcohol and nicotine has increased with the popularity of electronic cigarettes, which increase drug blood levels more than traditional cigarettes. However, it is unknown whether co-exposure to alcohol and nicotine via e-cigarettes during pregnancy increases drug blood levels or exacerbates offspring developmental delays more than singular drug exposures. Rodent models can be used to examine processes that cannot be tested in humans. This study used a mouse model to examine the effects of developmental co-exposure to alcohol and nicotine via e-cigarettes on maternal blood levels and offspring developmental milestones. Maternal mice and their offspring were exposed to alcohol, nicotine via e-cigarette, the combination, or vehicle during postnatal days (PD) 4-9, mimicking the human third trimester brain growth spurt. Preliminary results suggest that co-exposure to alcohol and nicotine decreases blood alcohol concentrations in maternal mice, indicating altered drug metabolism. In addition, developmental co-exposure may delay developmental milestones among offspring such as tooth eruption and ear unfurling. Data are still being collected, but these preliminary data provide valuable information regarding co-consumption of alcohol and nicotine via e-cigarettes during pregnancy, which is especially important considering 40% of pregnancies are unplanned.

Effects of Prenatal Co-Exposure to Alcohol and Nicotine via E-Cigarettes on Motor Coordination in Rats
Presenters: Sarah Weber, Kylie Wooden
Faculty Mentor: Dr. Kristen Breit
Department: Psychology

Alcohol and nicotine are the most commonly consumed legal drugs among pregnant people. Individually, prenatal alcohol or nicotine exposure is associated with impaired motor coordination later in life. However, alcohol and nicotine are commonly co-consumed, yet it is unknown whether combined prenatal exposure exacerbates the motor coordination deficits observed in singular exposure to each drug. Rodent models are vital for this research since they enable speedy data collection, control of extraneous variables, and serve as a valid translational model to clinical populations. The study examined whether combined prenatal alcohol and nicotine exposure via e-cigarettes exacerbates motor coordination impairments more than singular exposure. Pregnant rats were exposed to alcohol, nicotine, the combination, or a vehicle from gestational days 5-20, mimicking the human first and second trimesters of pregnancy. Adolescent offspring performed a parallel bar motor coordination task requiring subjects to successfully traverse two suspended parallel rods without falling, hanging, or sliding. Preliminary data suggest that prenatal nicotine exposure alone impaired motor coordination among offspring more than any prenatal alcohol exposure (alone or combined with nicotine). Subjects exposed only to nicotine prenatally took more trials to their first success and had lower success ratios. These impairments were not observed following any prenatal alcohol exposure, suggesting that alcohol may have different teratogenic effects on motor coordination. These preliminary data suggest that prenatal nicotine exposure may impair motor coordination, potentially due to early activation of acetylcholine receptors, which command motor behaviors.

The effect of the Learning to BREATHE Mindfulness Program on Salivary Cortisol Stress Response
Presenter: Diamond Williams
Faculty Mentor: Dr. Geeta Shivde
Department: Psychology

College students are at risk of experiencing adverse mental and physical health outcomes due to stress, inadequate coping skills, and emotional regulation. Mindfulness interventions could help with this because mindfulness has been shown to improve mental and physical health. The present study investigated the effects of a six-week mindfulness intervention (Learning to BREATHE) initially designed for adolescents. It was later adapted for emerging adults on emotion regulation and perceived stress in college students. In the current study, a group of introductory psychology students who participated in weekly in-person mindfulness training were compared to a control group who received written information about the benefits of mindfulness. Before and after the intervention, stress levels were measured using self-reports and cortisol samples before and after a cognitive challenge task. It is predicted that the stress response will decrease for the group receiving the learning to BREATHE training compared to the control group.

A Sustainable Synthesis of Cellulose Aerogels
Presenter: Robbie Witikko
Faculty mentor: Dr. Abbie Ganas
Department: Chemistry

Aerogels are a class of materials with remarkable physical properties like high porosity (90-99%), low density (0.0011-0.5 g/cm3), and large surface area (10-2000 m2/g)1. Cellulose offers a sustainable, renewable foundation to fabricate these aerogels as it is one of the most abundant biopolymers on Earth and can be sourced from recyclable materials. Further, cellulose aerogels can also be modified to exhibit tunable, advantageous chemical and electronic properties by adding in selective dopants, or impurities to the original source material. Current techniques to fabricate cellulose aerogels from recycled commodities involve caustic bleaching and oxidizing agents, which are neither sustainable, nor accessible. Our overarching goal has been to create a sustainable and accessible process that could be repeated in someone's home, increasing access to clean water.

RCAD 2024 Faculty Panels in Sykes Theater

This year we are hosting Faculty Panels in Skyes Theater. The following faculty will be presenting their experiences with applying for and receiving grant funding, working with students in research and creative activities, and managing internal and external grants.

College of Arts and Humanities (9:30am-10:20am)
1. Dr. Dyan Neary
2. Dr. Laquana Cooke
3. Michelle Blake
4. Dr. Emily Aguiló Pérez
5. Dr. Michael Burns, Dr. Tim Doughtery

College of Health Sciences and College of Business and Public Management (10:30am-11:20pm)
1. Dr. Reva M. Zimmerman
2. Dr. Danielle Yocom, Dr. Nancy Barker, Dr. Michelle Kaulback
3. Dr. Chiwoneso Tinago
4. Dr. Ebru Isgin
5. Dr. Susan Fiorentino
6. Dr. Jaeyong Choi

College of Education and Social Work (12:00pm-12:50pm)
1. Dr. Erin Hipple
2. Dr. Jade Burris, Dr. Jackie Van Schooneveld
3. Dr. Orkideh Mohajeri
4. Dr. Pauline Schmidt, Dr. Matthew Kreuger-Ross

College of Science and Mathematics (1:00pm-1:50pm)
1. Dr. Megan Fork
2. Dr. Zachary Voras, Kimberly Mullane
3. Dr. Danielle Chirdon
4. Dr. Ashik Bhuiyan
5. Dr. Linda Stevenson
6. Dr. Sean Buskirk

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