

## SCHOLAR Day Formal Presentations 2023

<b>Martina Starkey</b>	<b>Psychology</b>	<b>Dr. Kristine Turko</b>
<b>Macei Carter</b>	<b>Psychology</b>	
<b>Alexis Temple</b>	<b>Psychology</b>	
<b>Alexandrea Lemaster</b>	<b>Psychology and Criminal Justice</b>	
<b>Destiny Roberts</b>	<b>Neuroscience</b>	
<b>Marissa Radmore</b>	<b>Psychology</b>	

Session A1      Giese 107      8:30 AM

The Relationship Between Emotional and Physical Parental Absence on Childhood Anxiety      In this study, we will investigate how physical and emotional parental absence during childhood correlates to a person's level of anxiety. We have defined parental absence in both a physical and emotional form. Physical absence is when a parent either is divorced, died, or is deployed for military service. Emotional absence of a parent is a form of psychological neglect. Parental absence we separated into life events and trauma from a child's parents that results in one or both parents not being present in a child's life. We will recruit approximately 50 undergraduate participants on the University of Mount Union campus through the SONA research participant system used by the Department of Psychology, Neuroscience, and Human Development. The survey will measure demographics, adverse childhood experiences, emotional neglect, perceived stress, and anxiety. The Biopac system will be used to measure the participant's heart rate while they are taking the survey. We anticipate finding that heart rate will increase while participants take the survey if anxiety is present. We believe the survey will reveal that participants that experienced physical and emotional neglect experience more perceived stress and anxiety. Based on our findings, we will conclude if anxiety and heart rate increase in participants who have experienced physical and emotional neglect during their childhood. The research we are conducting will provide more insight into the relationship between parental absence and anxiety.

**Colton Wade**      **Biochemistry**      **Dr. Keith Miller**

Session A1      Giese 107      8:50 AM

Stop Right There! Neutrophil NETs reduce cancer cell migration and stimulate macrophages against cancer

The CDC projects 600,000 deaths from cancer in 2023. Of those, at least 67% will list metastasis, the spreading of cancer throughout the body, as a major contributing cause. Cancerous tumors form from uncontrolled cell growth. Normally, immune cells kill these cells before they can develop; however, forming cancers avoid immune cell recognition. Neutrophils are the most abundant immune cell, normally fighting pathogens by excreting their DNA to form extracellular traps (NETs). NETs can catch circulating cancer cells, enabling cells to adhere to tissue - resulting in the formation of new tumors. As NETs are efficient at locking cancer cells in place, this study examined whether NETs could be used at the site of a

tumor to reduce cancer metastasis. This was done using migration assays that analyzed cancer cell movement against increasing concentrations of NETs to be both visualized and quantified in an in vitro model, where high concentrations of NETs reduced cancer cell movement by 54%, suggesting NETs could reduce cancer metastasis. Further, the influence of NETs on stimulating another immune cell, the macrophage, was determined using an ELISA and live-dead cell staining to see if NETosis could reactivate macrophages to kill cancer cells. This research showed promise that NETosis could be deployed to slow cancer cell migration and reactivate the immune system to kill cancer. Future efforts will be done to deliver NET-stimulating compounds to the tumor site in mouse models to analyze whether NETs can reduce metastasis and activate macrophages.

<b>Micah Donley</b>	<b>Neuroscience</b>	<b>Dr. Kristine Turko</b>
<b>Ali Williams</b>	<b>Neuroscience and Intervention Specialist</b>	
<b>Harley Summers</b>	<b>Psychology</b>	
<b>Ciara Davis</b>	<b>Human Development &amp; Family Science and Primary Education</b>	
<b>Allison Lacher</b>	<b>Psychology</b>	

Session A1      Giese 107      9:10 AM

The Effect of Music on Heart Rate and Focus

In this study, we will investigate the effects of varying music genres on the heart rate and focus of students who require academic accommodations versus those who do not. We intend to recruit 30 college-aged participants to complete an in-person study including an online demographics survey and a measure of heart rate while completing a sustained focus task. Participants' heart rates will be measured as they complete a sustained focus task with three music conditions including heavy metal, classical, and none. We predict that heavy metal music will create more of a positive change in heart rate in those who utilize academic accommodations than those who do not, and heart rate will decrease below baseline with the addition of classical music and increase with heavy metal in all participants. The addition of music will yield higher scores on the sustained attention/focus test than in conditions without music. However, this improvement will be greater for those with academic accommodations. Findings of this study could be utilized to benefit students that utilize academic accommodations in terms of attention and focus when exposed to varying types of music.

<b>Gracyn Sage</b>	<b>Nursing</b>	<b>Dr. Nicole Johnson</b>
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Session A2      Giese 114      8:30 AM

Promoting Peace in the realm of the Transgender Community and Health Care

Those in marginalized communities are greatly affected by health care and their ability to live in healthy lifestyles. Transgender individuals, or those whose gender identity or gender expression differs from the sex they were assigned at birth, are at high risk for health disparities. Besides the discrimination, violence, economic challenges, and stigmas surrounding transgender individuals, they also face several mental,

physical, and emotional difficulties related to health care. Statistically, these individuals are at higher risk for HIV/AIDS, mental illness, sexual and physical illness, and substance abuse. Several factors also lead to difficulty in accessing health care and proper health insurance, including Ohio-specific legislation that directly affects these individuals. As nursing students, it is important for us to recognize these disparities, propose solutions, and provide recommendations for a better future for the transgender community. I have conducted research on the background of transgender individuals, analyzed data that is relevant to my research, and proposed my own solutions to the disparities that people of this community experience.

**Jessica Pisoni**

**Psychology**

**Dr. Tamara Daily**

**Lilah Shernit**

**Human Development & Family Science**

**April Ludlow**

**Psychology**

**Logan Ballard**

**Human Development & Family Science**

Session A2      Giese 114      8:50 AM

Grief Associated with Pet Loss and Human Loss

In this study, we are investigating how grief affects individuals who experienced the death of a human companion or an animal companion. We plan to recruit 50 undergraduate students from the University of Mount Union to complete an online survey. Participants will be 18 and older and will be required to have experienced either the loss of a human loved one or companion animal, not both. The surveys include measures of grief, grief-related depression, attachment to the deceased, and disenfranchised grief. The survey will differ for the participants by the type of loss they experienced, which will determine which attachment scale they complete. We expect to find no mean differences in grief-related depression scores between the two groups. We expect to find a positive correlation between grief and grief-related depression scores and attachment scores for both groups. Along with this, we expect that there will be no mean differences in grief scores. Also, we expect to find a positive correlation between disenfranchised grief, overall grief, and grief-related depression scores. Finally, we expect to find that those reporting on their experience of the death of a pet to report more disenfranchised grief. Based on these findings, we expect to conclude that pet loss continues to be overlooked as a legitimate form of grief. Research about this topic is important when considering college students because this is the typical age when grief is first experienced. Data collection was not completed at the time of abstract submission.

**Victoria Atkinson**

**Neuroscience**

**Dr. Tamara Daily**

**Julia Bates**

**Neuroscience and Biology**

**Matthew Fetty**

**Psychology**

**Kailey Windsor**

**Neuroscience**

**Maeve Smith**

**Psychology**

Session A2      Giese 114      9:10 AM

## The Effect of Cannabis Use Frequency on Stress and Long-term Memory

The incidence of cannabis use is increasing on college campuses across the United States as it becomes less stigmatized and is instead promoted as a method of relieving stress. Nevertheless, there is reason to question the efficacy of cannabis as a stress relief method among young adults due to its negative effect on long-term memory and its reported correlations with increased stress. In this research study, we further explored the relationship between the frequency of cannabis use and the ability to consolidate information into long-term memory under stress through a free recall task. Additionally, we investigated the relationship between the frequency of cannabis use and stress by studying heart rate (HR) and heart rate variability (HRV) during a cognitive stressor task. We expected to find that frequent and moderate cannabis users would report higher HR and lower HRV compared to infrequent or non-users. We also expected to find that infrequent users would report lower HR and higher HRV compared to non-users. Additionally, frequent and moderate cannabis users were expected to perform worse in the recall task than infrequent users, and non-users were expected to perform the best on the recall task. Based on these expected findings, we anticipated that greater cannabis use contributes to higher stress and worse long-term memory consolidation. In addition, we expected to conclude that infrequent cannabis use contributes to lower stress with minimal to no effect on long-term memory consolidation. Data collection was not complete at the time of abstract submission.

**Kyler Strotz**

**Mechanical Engineering**

**Dr. Khan Habeeb Ur Rahman**

**Benjamin Devenney**

**Mechanical Engineering**

**Bailey Blint**

**Mechanical Engineering**

Session A3      Giese Brush Hall      8:30 AM

### SAE Baja Car Rear Suspension Design

The Raider Racing Club at the University of Mount Union is affiliated to the Society of Automotive Engineers (SAE) Baja program. This program allows engineers from across the globe to design, build, test, and race their own Baja Cars in SAE sanctioned endurance race competitions.

In association with the University's Baja Raider Racing Team, design and construction of a brand-new vehicle to be used for the 2023-2024 racing seasons began in the fall 2022 semester. As part of the Mechanical Engineering Capstone project curriculum, the specific goal of the project is to construct a new rear suspension that would improve upon previous years' designs and performance.

The Baja Car Rear Suspension was designed following the engineering design process. First, the common types of rear suspensions were researched. Two different designs of differing suspension styles were then created as solid models in engineering software and evaluated for strengths and weaknesses. The final design was chosen through a decision matrix weighted toward ease of manufacturing and durability. Technical analysis of the final design was carried out by Finite Element Analysis (FEA) to ensure that it can withstand forces the car is likely to undergo. Finally, the rear suspension will be fabricated and tested for different stresses that are produced due to application of forces.

The rear suspension design consists of an independent trailing arm design allowing for either of the rear wheels to move independently of the other while still being driven wheels. The suspension is then completed using tie rods to ensure the proper direction of travel along vertical and horizontal axes. Finally, the inclusion of a shock to each side was necessary to allow for traversal over any obstacles.

**Marissa Scott**                      **English**                      **Dr. Michelle Collins-Sibley**

Session A3      Giese Brush Hall      8:50 AM

#### Foundations

Foundations, an experimental satire, invites readers to “save” America through a return to the values of its founders. Each of its thirteen sections approaches a significant early American event, value, person, or document in a unique form, including Instagram posts based on Benjamin Franklin’s Poor Richard’s Almanack and security footage of student Thomas Jefferson’s declaration to Principal George. Research ranging from the founding documents to grave listings, journal entries, literary works, and modern news serves as a model for the piece and brings a wide range of moments in American history together. Foundations develops an intertextual and entertaining commentary on the United States’ often imperfect and self-contradicting origins. Turns out a government “for the people, by the people” will, ultimately, be human (Lincoln).

**Hailey Csizmadia**                      **Mechanical Engineering**                      **Dr. Khan Habeeb Ur Rahman**

**Ronald Kaminski**                      **Mechanical Engineering**

**Alexander Mulvin**                      **Mechanical Engineering**

**Nicholas Perrott**                      **Mechanical Engineering**

**Aiden Samuel**                      **Mechanical Engineering**

**Micah Walker**                      **Electrical Engineering**

Session A3      Giese Brush Hall      9:10 AM

#### Development of a Rotating Electrical Turntable for UMU's Theater Department

The Turntable project for the Theater Department has been an ongoing development in the Engineering Department for the last several years. The Mechanical and Electrical Engineers have been collaborating on this project to make last year's Mechanical turntable design into a completed work; driven by an electric motor and controlled through a control system designed by the Electrical Engineers. This has featured many hours of research of the theater technology communication protocols, review and rework of components from the previous mechanical design, careful testing with electrical equipment, and fabrication of the steel frame of the turntable. From the mechanical standpoint, the group has incorporated study of rotating motors, welding training, and safety & support checks to construct a working structure for actors to perform on. Meanwhile, from the electrical side, the group has utilized coding, power analysis, and motor selection to allow the turntable to function. With combined

applications from both the mechanical and electrical disciplines of engineering, the finished project is designed to be used in future productions of the Mount Union Theatre Department.

**Urgela Figaro**

**International Affairs & Diplomacy and French**

**Dr. Michael Grossman**

Session A4      Giese Choral Hall      8:30 AM

The United States' Military Interventions in its Backyard: What patterns the U.S. showed in to invading Latin American countries such as Haiti?

The United States has been intervening in its backyard Latin America for two centuries. Previous studies have provided reasons such as imperialism, the fear of the spread of communism, the concept of "failed states" and "ungoverned spaces", etc. The following research paper aims to answer the question "What patterns the U.S. showed in to invading Latin American countries such as Haiti?". An analysis of different schools of thoughts such as realism, liberalism, and the English school, was conducted to understand the literature behind why foreign interventions occur in the first place. This study also looks at the reasons why the United States have intervened in Latin America in the past. To find the results for the research question, qualitative research was conducted by looking at over eighty resources such as newspapers, State department and White House statements, to identify patterns that the U.S. followed to intervene in Haiti. Turns out the factors they took into consideration were security concerns, the promotion/restoration of democracy, and the concepts of a "failed state" and "ungoverned space". These findings are important in that it helps better comprehend why the United States have been involved in Haiti three times in the past decades.

**Alaina Metzler**

**Chemistry**

**Dr. Robert Ekey**

Session A4      Giese Choral Hall      8:50 AM

Stayin' Alive, Stayin' Alive: A Study of Memory and Reaction Time in Diverse Populations

When flipping through playlists, how quickly do you recognize songs? Do you ever miss a line or sing too long? There may be a scientific explanation! This project focused on memory and reaction time of a diverse population, based on age, gender, and familiarity with songs, by having subjects complete lyrics to three musical prompts. Reaction times and durations of responses were measured and compared using WavePad software. Results found that the control group, men, country music fans, and those who identified as slightly musically inclined displayed better response length (duration) and promptness (reaction time). Subjects over 30 years old performed better in duration, while those 30 and under were more prompt. This project could lead to further advancement in metacognition-understanding our thought process- and memory. Future work could include expanding the sample size, testing different genres and decades, including new identifying criteria, and analyzing the impact of volume. The identified trends are important because research has found significant improvement in auditory and visual reaction time when background music plays. Additionally, studies concluded that increased volume slows reaction time. This is especially relevant when driving: background music may help reaction, but only at low volumes. Musical exposure also helps maintain slightly quicker reaction times for aging populations thus preserving abilities for longer. In a similar way, memory can be positively impacted by setting information

to a song or listening to a certain genre when studying to elicit stronger response during exams if the music is present.

**Madison Luthy**                      **Biomedical Engineering**                      **Dr. Lynn Dudash**

**Alyssa Devens**                      **Biomedical Engineering**

**Ryan Meister**                      **Biomedical Engineering**

Session A4      Giese Choral Hall      9:10 AM

#### Accelerating Wound Healing of Diabetic Foot Ulcers Using PLGA Scaffolds

Diabetic foot ulcers are a major health concern due to the increased risk of infection, amputation, and mortality among patients. There is an urgent need for effective treatments to improve healing outcomes and reduce the risk of complications. Poly(lactic-co-glycolic acid), otherwise known as PLGA, is a synthetic co-polymer that is utilized in the medical field for its advantageous attributes, such as biodegradability, biocompatibility, and controlled drug delivery. These attributes render PLGA-based scaffolds a promising solution to provide a suitable environment for the regeneration of affected tissue. This study seeks to evaluate the potential use of PLGA as a scaffold material for healing diabetic foot ulcers. The mechanical properties of this co-polymer are evaluated using compression tests, which involve applying a constant force to the polymer and quantifying its resistance to deformation until fracture. Chemical properties are assessed through swelling and degradation experiments, to ascertain the behavior of the polymer in a physiological aqueous environment of phosphate buffered saline (PBS). Finally, biocompatibility is assessed through cell viability and cell toxicity assays done on MG-63 human cells, to quantify the impact of the polymer on living cells. The results of these experiments are analyzed to determine the effectiveness of PLGA in promoting the healing of diabetic foot ulcers.

**Alyssa Ragazzino**                      **Exercise Science**                      **Dr. Ronald Mendel**

**Megan Zody**                      **Exercise Science**

Session A5      Giese 180      8:30 AM

#### A Comparison of Performance Variables in Consistent vs Inconsistent Hitters in D3 Collegiate Softball Players

Softball is a popular sport in the United States for female collegiate athletes. The offensive side of the game provides the team with the ability of winning the game by scoring runs. Finding variables that correlate to consistent hitters could help teams improve their overall offensive training and technique, which could positively impact their team's performance. Limited research (1,2,3) exists on the performance variables and components of a softball swing, so the purpose of this study was to identify whether there is a difference in multiple performance variables in division three softball players to assist in determining whether they are an inconsistent or consistent hitter. In this study 20 subjects participated in a variety of field testing that included measurements of bat velocity, ball exit velocity, rotational acceleration, one repetition maximum back squat, grip strength, and reaction time. Data collection and

analysis was not completed at the time of abstract submission. The project and its results will contribute to the field of sports science, especially softball, and further the analysis of what performance variables in the game should be focused on for success.

References:

1. DeRenne, C, and Morgan, CF. Multimodal modeling increases performance and biomechanical indicators in intercollegiate softball players: a longitudinal study. Journal of sport behavior 36: 130-148, 2013.
2. Teichler, LSR, Brandi. The relationship between bat velocity, upper and lower extremity power, and the rotational kinetic chain in NCAA Division II softball players.
3. Weimer, B, Halet, K, and Anderson, T. Relationship of Strength Variables to Bat Velocity in College Baseball and Softball Players.

<b>Tyler Venti</b>	<b>Mechanical Engineering</b>	<b>Dr. Khan Habeeb Ur Rahman</b>
<b>Oscar Okechukwu</b>	<b>Electrical Engineering</b>	
<b>Joe Origlio</b>	<b>Mechanical Engineering</b>	
<b>Michael Dietrich</b>	<b>Mechanical Engineering</b>	
<b>Gabe Obrist</b>	<b>Electrical Engineering</b>	

Session A5      Giese 180      8:50 AM

Robotic Running Back Base

This project aims to develop a Running Back (RB) robot concept for the Raider Robotics Club that will participate in the 2023 Spring Robotic Football Combine at the University of Notre Dame. The RB robot is expected to have exceptional maneuverability, exhibit outstanding performance in combine events, and comply with the Robotic Football Conference's requirements. To achieve these goals, the robot's design is based around direct drive high output motors combined with simple electrical systems. The RB cannot exceed 30 pounds fully equipped. The target weight for this RB is 28 pounds, features a 16x16 footprint, 9000 W of power, and 4-wheel drive.

The robot will participate in the shuttle test, three-cone drill, strength test, speed test, and stress test. The robot's performance will be compared to other schools in the combine. The robot's design, programming, and assembly should be consistent with the Robotic Football Conference's specifications to qualify for the competition. Upon completion, the RB robot will be gifted to the Raider Robotics Club for use in future competitions.

<b>Emily Miller</b>	<b>Exercise Science</b>	<b>Dr. Ronald Mendel</b>
<b>Jalyn Oswald</b>	<b>Exercise Science and Psychology</b>	



Session A5      Giese 180      9:10 AM

### The Effects of Different Dosages of Vitamin D3 Supplementation on Mental Wellness & Muscular Strength in College Students

The role of vitamin D3 in mental wellness and muscular strength has been investigated in a variety of populations, but the analysis of vitamin D3 supplementation on college-age students in relation to these topics has not been investigated together. Mental wellness is important as the conversation surrounding mental health is becoming more prevalent and normalized for college students. Some studies (Anglin et al. 2013; Dumville et al. 2006) have shown that reduced vitamin D3 levels are associated with lower levels of perceived mental wellness, but the topic is controversial as few have shown these to be statistically significant. The impact of vitamin D3 on muscular strength has also been shown to be equivocal, however, a common belief exists that increased levels of vitamin D3 leads to increased strength (Stockton et al. 2010; Tomlinson et al. 2015). It is known that mental health has strong ties to physical health as studies have shown that people with mental illness have a higher likelihood of developing chronic diseases (Ohrnberger et al. 2017; Robson & Gray 2007). Therefore, mental wellness and muscular strength may exhibit improvements with vitamin D3 supplementation. A 6-week study was designed to investigate this relationship among three groups consuming different dosages: 1,000 IU; 5,000 IU; placebo. Each group was assessed through pre- and post-testing via four mental wellness questionnaires and 1-RM bench press and back squat (maximum weight for one repetition). An exercise program was provided to complete throughout the study. Data collection was not complete prior to abstract submission.

**Maeve Smith**

**Psychology**

**Dr. Jamie Capuzza**

Session B1      Bracy 02      9:45 AM

### Corporeal and Visual Rhetoric in Emma Sulkowicz's Mattress Piece (Carry That Weight)

In 2014, a young woman enters national headlines as a heroic underdog making big changes at her university. For the 2014-2015 school year, Emma Sulkowicz could be seen lugging a 50-pound mattress whenever she was on campus. What began as a senior thesis project morphed into a social movement, and Sulkowicz incorporated elements of visual and corporeal rhetoric to enhance the power of her message. Surrounded by students with backpacks and briefcases, Sulkowicz was easily identifiable as she struggled around campus with her furniture. While her difficulties carrying the mattress were apparent to those around her, what her peers did not know was that this hefty mattress represented Sulkowicz's internal battle with depression and anxiety following a rape committed by a classmate. Sulkowicz made several attempts to officially report the incident to countless authorities before the idea for the project was created, and its purpose is to publicize the private emotions of pain and insecurity experienced by victims of sexual assault. While gaining plenty of support from her peers, including assistance in carrying the mattress, Sulkowicz received pushback from the university. Despite countless attempts by the university to put a stop to this performance, Sulkowicz proudly graduated with her mattress in 2015-- notably also alongside her rapist who was never removed from the university. Though almost a decade has passed, Sulkowicz's performance continues to change the stigma surrounding assault. Sulkowicz's story perfectly exemplifies the plight and struggles of sexual assault victims and forces its audience to feel her pain alongside her.

**Urgela Figaro**

**International Affairs & Diplomacy**

**Dr. Bertrand Landry**

Session B1      Bracy 02      10:05 AM

The Tragedy of the Haitian heroes Henri Christophe and Jean-Jacques Dessalines: Their immortalization in Theater

Henri Christophe and Jean-Jacques Dessalines are famous historical figures that are admired by the nation of Haiti. In this project, the events that led up to their deaths were compared to three different plays that were written about them: “La Mort au Pont Rouge” by Jean Metelius, “L’empereur Jean-Jacques Dessalines Sacrifice à l’aube” by J. A. Gracien, and “La Tragedie du roi Christophe” by Aime Cesaire. Before analyzing the plays, a brief history of Haiti after its independence and some background information about Henri Christophe and Jean-Jacques Dessalines are provided . This project found that while “La mort au pont rouge” was close to Dessaline’s actual death, “L’empereur Jean jacques Dessalines Sacrifie à l’aube” did not follow the original story and romanticized his death. “La tragedie de Henri Christophe” was mostly accurate with Henri Christophe’s death.

**Jacklyn Sullivan**

**Primary Education**

**Dr. Mary-Beth Henning**

Session B1      Bracy 02      10:25 AM

Incorporating Cheyenne Culture in K-8 Education

During the Summer of 2022, I accompanied Dr. Mary-Beth Henning and Mr. Sam Chestnut of the Lippman School in Akron to Lame Deer, Montana to the Northern Cheyenne Reservation to learn about Cheyenne culture. Information on Native American culture should be included in every culturally diverse education, particularly since most history books present a biased viewpoint. As a part of their curriculum, the Lippman School has incorporated visits by tribal members who speak about their history, language, and how their culture is closely tied to nature, in preparation for middle school students to visit the reservation for first-hand exposure to Cheyenne culture. I will share how I plan to incorporate Cheyenne culture in my future K-5 teaching.

**Miah Wilson**

**Physician Assistant Studies**

**Prof. Vanessa Worley**

Session B2      Bracy 04      9:45 AM

Using Three-Dimensional Printing to Design Bio Models and Protheses to Aid in the Reconstruction of Craniofacial Defects

Autologous bone and bone+skin free flaps have remained the gold standard for surgical treatment of craniofacial defects, however, experts are on a quest to incorporate 3-dimensional (3D) printing into the design of facial prostheses and bio models as surgical aids for conditions such as cleft palate, craniosynostosis, and hemifacial microsomia. This systematic review of literature will investigate the various ways that reconstructive teams are using 3D printing technology to perform complex surgeries with improved accuracy. For instance, the recreation of complicated anatomy has allowed for better presurgical planning and guides created prior to surgeries have reduced operative time. The review will

seek to determine which craniofacial defects are best suited for this type of innovation. Guidelines for medical 3D printing created in recent years by the Radiographic Society of North America will be presented as well. Biomedical engineers, computer scientists, medical specialists, and anyone interested in the cutting edge of care will enjoy learning how the future is now.

**Emma Smith**    **Human Development & Family Science and Intervention Specialist**    **Dr. Tamera Daily**

**Kylie Laug**    **Psychology**

**Jalyn Oswald**    **Exercise Science and Psychology**

**Kassie Tassie**    **Psychology**

**Cassidy Nelder**    **Psychology**

**Lauren Snyder**    **Human Development & Family Science**

Session B2    Bracy 04    10:05 AM

The Effects of Childhood Adversity on the Mental Health of College Students

In this study, we investigated poor family relationships and diverse forms of childhood adversities to expose the negative impact as we age. We recruited approximately 100 undergraduate students (50 females and 50 males) from the University of Mount Union to complete an online survey. These students must be over the age of 18 and be involved in campus organizations or athletic teams. In our study, we are looking at how the measures of PTSD, anxiety, depression, and perceived stress affect total ACEs on college students. We will be using the PHQ-9 Scale, the Behavior Risk Factor Surveillance System Adverse Childhood (ACE) Module, Burns Anxiety Inventory, and the Posttraumatic Stress Disorder Scale Interview for DSM-5 to evaluate participants. We found that there were positive correlations between total ACEs score and scores on the measures of PTSD, anxiety, depression, and perceived stress. In addition, we also found that people with a history of exposure to domestic violence, have a parent with mental illness, and experienced parental separation/divorce reported higher mean scores on the measures of PTSD, depression, anxiety, and perceived stress than people without exposure to these adversities. As the overall ACEs scores increased, the mental health scores decreased. Based on these findings, we conclude that individuals with higher adverse childhood experiences, including exposure to domestic violence, having a parent with a mental illness, and having experienced parental separation/divorce, have increased mental health symptoms, including PTSD, anxiety, depression, and perceived stress.

**Kassity Miller**    **Physician Assistant Studies**    **Prof. Vanessa Worley**

Session B2    Bracy 04    10:25 AM

Medical Puzzle: Finding the Missing Piece Between Patients with Autism Spectrum Disorder and Their Healthcare Providers

Have you ever gone to the doctor's office and experienced a sense of unease, discomfort, or confusion? The waiting room may be loud, the examination room scary or cold, the people and things around you

overwhelming. Now imagine approaching this while having a neurological condition that magnifies all these features and creates challenging communication between you and your medical provider. This is autism spectrum disorder (ASD). For people with ASD, medical interactions can be incredibly puzzling and difficult – so much so that some avoid seeking medical care even when they need it. This systematic review of literature aims to determine if there are simple tools and strategies that can be implemented in medical interactions that will result in an increased number of regular visits attended and/or improve the patient or parent experience for those with ASD. The evidence supports many different approaches; key pieces include education, accessibility, and understanding.

**Ashten Yoder**

**Physician Assistant Studies**

**Prof. Vanessa Worley**

Session B3      Bracy 06      9:45 AM

Teaching More Than Reading and Mathematics: Integrating Mental Health Care into Elementary Schools

You may reflect on your childhood as a time of carefree adventures and blissful ignorance, with few troubles outside of playground woes. Unfortunately, this is an increasingly diminishing reality, as symptoms and struggles of mental illness are developing at younger ages. The mental health crisis affecting our nation is a rapidly growing concern that spares no one, not even the youngest, most vulnerable members of society – children. This begs the question of how we can best help ease the burden of mental illness in youth. This systematic review of literature evaluates several different school-based mental health programs and their effectiveness at providing therapeutic interventions and aiding in the development of coping skills. It also assesses whether these programs help minimize the negative effects of mental health concerns in elementary-aged children. The research seeks to identify if school-based programs are an effective way of addressing the mental health crisis in kids, with the hope that we will ultimately be able to return some of childhood's freedom and joy.

**Alexandra Cox**

**English**

**Dr. Michael Olin-Hitt**

Session B3      Bracy 06      10:05 AM

"I Have Had My Vision": Virginia Woolf's Use of Writing as a Coping Mechanism

Literature has a powerful ability to provide a glimpse into the life of the author. As mental illness has long been stigmatized despite its prominence, these stories can bring an author's hidden struggles and traumas to light. Although she was never diagnosed in her lifetime, modernist author Virginia Woolf was a prime example of a woman who likely suffered from a mental illness that was ineffectively treated and was in need of an outlet. As we now know, writing about one's struggles can produce therapeutic effects. Psychologists today recommend journaling as a way to cope with depression, anxiety, and stress. While this information was unknown during Woolf's time, I believe she was a pioneer of this coping mechanism. In this presentation, I highlight connections that scholars have noted between Woolf's personal life and what she wrote in her diaries, memoir "Moments of Being," and novels such as "Mrs. Dalloway" and "To the Lighthouse." I provide historical context to the rising field of psychology during Woolf's time in addition to the stigmas surrounding mental illness, especially for women. I argue that Woolf's novels and diary entries suggest that she used writing as a coping mechanism to process traumatic events and

struggles in her life. More research can be done to strengthen this connection among other authors and to help explore the usefulness of writing as a coping mechanism.

**Tiffany Bolen**

**Nursing**

**Prof. Karen Towne**

**Mackenna Wertman**

**Nursing**

Session B3      Bracy 06      10:25 AM

Using frequency therapy for the treatment of osteoarthritis: A review of literature for evidence-based practice

Osteoarthritis, most common in older adults, causes a cycle of inactivity and increased pain, due to the inflammation from the synovial fluid and possible deformation of the joint, but improves with joint movement. Many literature reviews were conducted to determine if Frequency- Specific Microcurrent should be recommended as a non-pharmacological evidence-based practice intervention to reduce osteoarthritic pain and increase range of motion. Recent studies have shown Frequency- Specific Microcurrent is effective in decrease pain on a scale of 1-10 and increasing range of motion. It is a low-risk intervention due to non-invasive technique and has decreased side effects compared to current surgical and pharmacological interventions as there is no hospital stay, but it is an extensive treatment.

**Martina Starkey**

**Psychology**

**Dr. Melissa Muller**

Session B4      Gallaher 122      9:45 AM

The Effects of Feline Personality, Coat color and Socialization on the Perceived Human-Cat Relationship

In this study, we researched feline coat color, personality and sociability to determine what influences the human-cat relationship. We surveyed cat owners that are 18+ years. We recruited roughly 100 participants from social media outlets like Facebook, Instagram, Twitter, and cat websites. Along with this, students at the University of Mount Union were given extra credit by the psychology department if they completed our survey. The survey was used to measure feline and owner demographics, cat-owner relationship satisfaction, feline personality, and feline sociability. We are examining the contradictory information regarding black cats and their friendliness while examining if orange cats having better relationships with their owners. We believe that more socialized cats will have a better relationship with owners as well. We also believe that there will be a positive relationship between agreeableness and a satisfactory human-cat relationship and a negative relationship between neuroticism and the human-cat relationship. Although studied independently, or with less variables at one time, previous research supports our hypothesis that coat color, cat personality and cat socialization affect the human-cat relationship. Overall, limited research exists regarding feline companions. Therefore, our research on this topic may lead to greater knowledge about how cat coat color personality and sociability is related to the satisfaction of the cat-owner relationship. It will also provide cat owners with additional information about what correlates to a more positive or negative cat-owner relationship. To the best of our knowledge, no previous research exists that includes all of our variables. As a result, we are completing pivotal research in a nearly uncharted area of animal research.

**Gretchen Koken**

**Psychology and Criminal Justice**

**Dr. Frank Tascone**

Session B4      Gallaher 122      10:05 AM

#### The Dangers of Being a Woman on College Campuses

While there is a lot of research out about the safety protocols that women must take regarding their life, especially on college campuses, it is not necessarily something that is highlighted to the student body. Through my research, it is evident that being a woman creates a greater risk for sexual assaults, being drugged at bars or parties, as well as being kidnapped. With The University of Mount Union being such a small school, the occurrences of these things can often be swept under the radar. Therefore, this presentation highlights statistics, as well as precautions for female students to take when indulging in activities both in and around campus. The research provided throughout this presentation are from organizations such as The National Institute of Justice, The Office of Women's Health, RAINN (Rape, Abuse and Incest National Network), and other verified researchers within this topic. The goal of this presentation is to provide insight and actions that can be used for fellow staff members, students, and the community when dealing with these situations.

**Katie Lawton**

**Physician Assistant Studies**

**Prof. Vanessa Worley**

Session B4      Gallaher 122      10:25 AM

#### Does Shockwave Therapy Help Heal Osseous Injuries in the Lower Extremity?

Can you imagine having pain in your leg or foot every time you take a step? Stress fractures and shin splints or medial tibial stress syndrome (MTSS) are examples of overuse injuries often affecting the lower extremity (LE). Overuse injuries happen in the general population but are especially common in athletes; for all, the road to recovery can be long and difficult. Could there be a faster way to achieve bone healing so that these individuals can return to full activity sooner? This systematic review sought to evaluate the existing body of literature on the effects of shockwave therapy for LE stress fractures and MTSS. The results are conflicting with no consensus on whether shockwave therapy should be a mainstay treatment for these conditions or not. More research is needed because this noninvasive approach shows promise and may be best for specific patients with osseous injury of the LE.

**Gibson Cornett**

**Exercise Science**

**Dr. Ronald Mendel**

Session B5      Gallaher 226      9:45 AM

#### What is the most effective rest interval after performing a conditioning activity but before performing a jump and sprint test amongst collegiate athletes?

Post Activation Potentiation (PAP) is defined as the ability of a muscle to exert a greater force due to a previous contraction (Robbins, 2005). Past research has explored the effects of PAP using a conditioning activity amongst collegiate athletes to see if there is a performance boost in a subsequent exercise. One of the more common conditioning activities is a variation of a squat protocol (Leyva & Brown, 2016). However, what seems to be uncertain is the optimal rest interval following the squat protocol due to the

relationship between fatigue and force development. Too little of rest time results in too much fatigue and a decrease in force whereas too much rest results in a loss of the possible PAP effect. In this study, athletes who regularly exercised their fast twitch fibers completed 6 different testing sessions. Each testing session had the athletes perform baseline tests in the Countermovement jump (CMJ) and 40 yard-dash. They then performed 4 repetitions of the squat at 80% of their 1RM and then waited an assigned rest interval (ranging from 3-8 minutes). The athletes were then retested in the CMJ and 40 yard-dash to see the potential PAP effect and at what rest interval on average benefited the athletes the most. Data collection and analysis were not complete at this time of submission.

**Anna Zumbar**

**History and Spanish**

**Dr. Theresa Davis**

Session B5      Gallaher 226      10:05 AM

**Support and Reform: How Female Lawyers in the Late 19th and Early 20th Centuries United and Advocated for Change**

Into the late 19th and early 20th century, legal education and professions for women began to evolve. More women were gradually seeking legal education and aspiring to have careers in the legal field. While elevated numbers of women were seeking legal education and careers, women faced barriers both in the classroom and in professional life. Women lawyers were also in the unique position of determining how best to establish themselves in the legal profession. Thus, numerous women began to support one another and advocate for reform to create a more equitable legal field. Various historians and lawyers writing for law reviews and historical journals have explored how early female lawyers supported one another and advocated for reform. In this historiographic presentation, I will explain how early female lawyers supported one another and advocated for reform through publications, clubs and associations, and establishing institutions thereby accelerating the acceptance of women in the legal field into the 21st century.

**Josh Momeyer**

**Exercise Science**

**Dr. Ronald Mendel**

**Ryan Sarkisian**

**Exercise Science**

Session B5      Gallaher 226      10:25 AM

**Effects of a 6-Week Modified Mindfulness-Based Stress Reduction (MBSR) Program on Psychological Well-Being and Anaerobic Sport-Performance in DIII Track Sprinters**

Research (Raglin, 2001) has postulated an inverse relationship between acute psychological stress (APS) and an athlete's ability to perform in competition. Mental components of running, like fatigue, doubt, or anxiety have been argued to be equally important as a focus in physical training (De Pretrillo et al. 2009, Hammer et al. 2009). The nature of running creates a greater opportunity for the mind to wander and lose focus; resulting in a need for techniques to enhance mental control during sport.

The Mindfulness Based Stress Reduction (MBSR) program emphasizes fluid self-belief and cognitive clarity. Across populations, these practices have been found to subside mental fatigue and improve cognitive and physical performance (Baltzell et al. 2022, Birrer et al. 2012). Limited research has been

done to identify what type of athletes benefit from this training. Therefore, the purpose of the study was to examine a modified 6-week MBSR program amongst college-level track athletes. Fifteen division III 400 meter runners were recruited and divided into three groups; the MBSR group, the meditation group, and the control group. The MBSR group consisted of weekly 1-hour sessions of videos, readings, and individual practice followed by Palouse Mindfulness, while the meditation group was assigned to ~10 minutes of daily meditation. Progress was tracked through self-reporting surveys and a 300 meter pre- and post-time trial. Those in the MBSR group were hypothesized to see greater adaptation than both the meditation and control groups. Data collection and analysis was not completed at the time of abstract submission.

<b>Annabelle Saultz</b>	<b>Psychology and English</b>	<b>Dr. Kristine Turko</b>
<b>Lexi Schuller</b>	<b>Psychology</b>	
<b>Nichol Ellesin</b>	<b>Psychology</b>	
<b>Eli Obrist</b>	<b>Psychology</b>	
<b>Shyanna White</b>	<b>Psychology</b>	
<b>Gretchen Koken</b>	<b>Psychology and Criminal Justice</b>	

Session C1      Oak Hall 203      3:15 PM

**Division III Student Athlete Stress, Anxiety, and Burnout Based on Gender and Sport**

Stress and anxiety literature is often centered around high-level Division-I and Professional athletes who have money (scholarships), difficult travel schedules, physical stress, and fans. Division III athletes are usually not the focus of psychological studies or sports information, as there is less money, fan interest, and media attention attracted by these smaller programs in comparison to their Division I counterparts. The University of Mount Union is a DIII school with many successful athletic programs. These programs have produced some professional and Olympic level athletes, making this population ideal for conducting research that evaluates the mental health of student athletes. In our study, we plan on recruiting male and female student athletes from both team and individual sports teams to complete our survey. This survey will be used to determine the student-athletes' mental health, specifically how involvement in their sport impacts psychological stress, anxiety, and feelings of burnout. We will compare the results not only between individual and team sports, but between males and females as well. We expect to see that females experience more anxiety in team sports. We also expect to see that females experience more symptoms of stress, anxiety, and burnout, leading to higher rates of retirement. Lastly, we expect to see that males experience more sports anxiety in individual sports than team sports. Results from this study will aid athletes, coaches, and other staff in addressing specific mental health concerns that are specific to individuals, as well as identifying certain populations that may be more at risk for developing these symptoms.

<b>Joshua Yarnell</b>	<b>History</b>	<b>Dr. Theresa Davis</b>
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Session C1      Oak Hall 203      3:35 PM



## Reconstruction Reexamined: A look into the historiography of Reconstruction

There is perhaps no era in American history that has been simultaneously maligned and glorified quite to the extent of Reconstruction. To understand why opinions have varied so dramatically, one must understand what occurred. From 1865 to 1877 the United States led a military occupation of the south as a means of keeping the desecrated region in check and ensuring protections for the newly emancipated slaves. For years this era was viewed with shame and condemnation, as a period of Northern tyranny over the South. In recent decades, however, new scholarship views Reconstruction as a missed opportunity, one that did not go far enough in restricting the South and empowering black Americans. The point of this project was to gain a general understanding of the interpretations on Reconstruction, and by using these interpretations acquire a more synthesized story closer to the truth. To do this I looked back upon the earliest historical interpretations of Reconstruction, primarily those of the Dunning School, which tended to lend sympathy to southern views. I then looked at the first major dissenters against the narrative of Reconstruction, such as W.E.B. Du Bois and John R. Lynch, two black scholars who emphasized the brutality of southern institutions towards black Americans. These new interpretations gained traction, and especially during the Civil Rights Movement many historians swung away from the Dunning School. Among these, none have been as influential as Dr. Eric Foner, whose works on Reconstruction have created a new consensus.

**Hannah Botzman**

**Exercise Science**

**Dr. Ronald Mendel**

Session C2      Oak Hall 206      3:15 PM

Does Alpha-Linolenic Acid supplementation influence the effects of exercise induced muscle soreness after an eccentric exercise bout?

Previous research has shown that omega-3 fish oils containing Docosahexaenoic acid (DHA) and Eicosapentaenoic acid (EPA) may reduce muscle stiffness, the delayed onset of muscle soreness (DOMS), swelling, and muscle damage along with increasing range of motion (Tartibian et al. 2009, Tsuchiya et al. 2016). Alpha-Linolenic acid (ALA) is an omega-3 fatty acid commonly sourced from in plant foods such as flaxseed, soy, and walnuts. The purpose of this study was to identify if ALA has similar anti-inflammatory properties to those of DHA and EPA. A decrease in inflammation is beneficial to reduce muscular soreness along with inflammatory conditions like rheumatoid arthritis and diabetes.

Twenty untrained men and women were recruited, and the study was divided into two groups (ALA and placebo). Participants were assessed for baseline inflammation measurements consisting of a visual soreness evaluation, leg circumference of the quadricep, and a pressure algometer test. Participants then completed a 1RM squat and 1RM leg press. During the second and fourth visit participants completed an eccentric exercise protocol consisting of an 85% 1RM squat for 3 sets of 5 repetitions and a 90% 1RM leg press of 3 sets for 3 repetitions to induce muscle damage and soreness. The third and fifth lab visit took place 48 hours after the previous eccentric protocol and consisted of visual soreness scale, leg circumference, and a pressure algometer measurement. Data collection was not complete at the time of abstract submission.

**Logan Good**

**Physics**

**Dr. Steven Cederbloom**

Session C2      Oak Hall 206      3:35 PM

**Studying the Dark Matter Distribution in the Spiral Galaxy M88**

The matter and energy that everyone uses and interacts with only takes up about 5% of all the matter and energy in the universe. Dark matter and dark energy take up roughly 25% and 70%, respectively. Because dark matter and dark energy are so prevalent throughout the universe, there are millions and possibly billions of these elusive particles flowing through every human on Earth. Thus, it is vital to understand what dark matter is and what it's made of. M88, a nearby spiral galaxy, shows signs of containing dark matter, as nearly all galaxies do. A common way astronomers detect dark matter is by calculating the discrepancy between the optical and orbital methods, which are two methods that can be used to measure the mass of galaxies. By using an optical telescope in Utah and a radio telescope in Green Bank, West Virginia, we were able to calculate the mass difference of M88 using the two different methods. Understanding where dark matter is grouped and how much there is can help explain its origins and its possible constituents. It's crucial to be able to explain what dark matter really is because it makes up so much of the universe we all live in.

**Alexis Smith**

**English and Spanish**

**Dr. Michael Olin-Hitt**

Session C3      T&H 200A      3:15 PM

**"Fear in a Handful of Dust": Death and Trauma in T.S. Eliot and Toni Morrison**

This research examines the nuanced connections between modernism and postmodernism that transcend race, class, gender, etc. Although T.S. Eliot and Toni Morrison are diametrically opposed in every important way, their literature has the space to speak between the lines of literary movements. Both authors share uniting themes of death and trauma that stem from specific times, spaces, and places.

**Brandon Mazzei**

**National Security and Foreign Intelligence Analysis**

**Dr. Michael Grossman**

Session C3      T&H 200A      3:35 PM

**An Impetus for Armed Conflict? The Geostrategic Importance of Taiwan in the Face of an Emboldened China**

The Taiwan issue is at the forefront of the growing competition between the US and China. The Chinese, through an emboldened and aggressive approach, are attempting to reunify Taiwan with the mainland. The tensions between China and Taiwan are rooted in unresolved matters at the end of the Chinese Civil War in 1949. A Chinese acquisition of Taiwan has the potential to disrupt the region and international system politically, economically, and militarily. The US' regional allies of Japan and South Korea have undergone a policy shift toward combating Chinese aggression toward Taiwan and Eastern Asia. The US has continuously renewed its vows under the Taiwan Relations Act of 1979 to ambiguously defend Taiwan against Chinese aggression. The US, along with Japan and South Korea, have made ambiguous vows to defend Taiwan militarily in the event of Chinese military action against Taiwan. Taiwan plays a vital role

in the regional and global economies through its maritime shipping routes and contributions to the tech sector. A Chinese acquisition of Taiwan would bolster the Chinese position in the South China Sea, which in turn could threaten the regional order. The US has a vested interest in ensuring that Taiwan does not succumb to Chinese aggression politically, economically, and/or militarily. The Taiwan issue is the epicenter of US national security and geostrategy in Eastern Asia. Chinese aggression toward Taiwan, and the potential capitulation of Taiwan, is a threat to the US' national security and geostrategy in Eastern Asia.

**Olan Domer    Theatre and Media    Dr. Adelina Cooper**

Session C4    T&H 201    3:15 PM

Film and Theatre: Using Actor-Focused Methodology to Craft a Visual Narrative

Honesty and thoughtfulness are key ingredients to telling a meaningful story. Studying and practicing acting methodologies allows the individual to strengthen these skills, but can these same techniques apply to filmmaking? In this session, we'll explore how the key components of visual narrative production - from drafting a script to picking up the camera, and even in post-production - are greatly improved with theatrical acting training. Attendees will gain an understanding and appreciation of the techniques used in both film and theatre for effective and impactful world-building through the process of producing a short film, all while marrying the two seemingly diverse methods of acting on stage and for the camera.

**Matthew Sendrey                      Mechanical Engineering                      Dr. Khan Habeeb Ur Rahman**

**Blane Himmelheber                      Mechanical Engineering**

**Kyle Burns                                  Mechanical Engineering**

**Seth Stevens                                Mechanical Engineering**

Session C4    T&H 201    3:35 PM

TimkenSteel Roller Table Capstone

Working alongside Mount Union alumni at TimkenSteel, we measured, designed, and modeled a new roller table to be placed into the Faircrest Steel Plant. This new table design will feature larger rollers, stronger spherical bearings, and thicker supporting walls. Updating this design was necessary due to the increase in mass of the steel being passed by the table since the old model's implementation four decades ago. We completed calculations to ensure the safety and resilience of the new design with the increased stress and load. This process is important within our discipline and to others because it represents replacing old systems with new ones, learning from their shortcomings and making better design choices based on them.