

SCHOLAR Day Presentations-Formal

Durum Alarms (Mechanical Engineering) See Matthew Mulvihill

Kayla Ashdown (Early Childhood Education) See: Alexis Parsons

Danielle Augustin (Exercise Science) Session 1, #1, T&H 201

Dr. Nathan Saunders Exercise Science

Title: The Effects of a Downhill Running Bout on Endurance Trained Runners vs Sprint Trained Runners

Abstract: Several different types of runners utilize downhill running (DHR) for training purposes. Sprinters often utilize DHR which allows them to reach faster speeds in training in the hope that they can then translate those faster speeds into competition over time. Endurance runners often utilize DHR in preparation for ultra-marathons, which consist of extended periods of extreme uphill and downhill slopes. Before using DHR as a training method however, runners and coaches should be aware that DHR can be an extremely muscle damaging type of exercise. This muscle damage can cause severe muscle soreness and inflammation in the days following and can in turn effect performance. This research seeks to investigate if there is a difference in how each of these two running populations respond, recover, and perform in the two days after a 30-minute DHR bout at 55% of their maximal running effort on a - 10% grade. These two types of runners have been hypothesized to have different responses to DHR due to their unique training methods and muscle fiber composition. The measures of heart rate, stride length, stride frequency, maximum electrical output of the quadriceps, rate of perceived exertion, and soreness were all measured during performance in the two days post-DHR. Knowledge of the response that certain types of runners have to DHR and other similar muscle damaging exercise will allow for adequate practice and competition planning by athletes and coaches to ensure peak performance and to prevent injury.

Reilly Augustine (Psychology) See Louis Ventura Duran

Allison Baird (Nursing) Session 3, #3, EBB 206

Professor Betty Allen Nursing

Title: Warning: Norovirus lurking here

Abstract: Where have your hands been today? Bacteria and viruses lurks in student's door rooms, public restrooms, and even your family's household. They don't show up with big signs but they leave an impact on the body in a big way. According to the CDC, nearly 21 million acute cases of norovirus incidences happen every year in the United States. But is norovirus really a big issue for YOU? Yes!

Norovirus is the leading cause of gastroenteritis worldwide! We encountered norovirus firsthand this year. The purpose of this presentation is to expose norovirus and empower you to prevent your chances in encountering it. We know the warning signs and we can help prepare you to fight Noro if you meet it.

Kate Baker (Middle Childhood Education) See: Alexis Parsons

Abigail Bartoszewicz (Communication) Session 3, #2, EBB 206

Dr. Malynnda Johnson Communication

Title: Bullying the Gay Community: Giving Society A Taste of the Rainbow

Abstract: The purpose of this study is to educate and understand the effects that negative language and bullying have on the gay community. The significance of this study is to raise awareness for bullying the gay community along with finding ways to prevent this problem from continuing to occur. In this study I performed a qualitative method by first conducting voice recorded interviews. These participants' ages were taken of those who were 18 and older. This allowed for a wide range of responses as well as a mature selection of people who felt more confident in their sexual orientation. These interviews allowed me to receive a personal outlook on their opinions on the subject of bullying and negative language specifically. I interviewed 16 participants and from this process I was able to narrow my research into specific topics to use for this documentary. Then I selected one narrator that would explain my research as well as four subjects that would present their stories and opinions on the selected topics. As they discuss and present their stories, there are also videos and photos from their past and present lives that are included. The findings of this research unveil the shocking reality of the major effects that negative language and bullying have on gay community. No matter whom people desire to love at the end of the day we should treat one another as we would want to be treated. Not one person on this earth is the same so we should not ridicule each other for our differences. The change begins with education. Open your hearts and minds to this problem that should no longer go unnoticed. Here are their voices and their stories.

Taylor Bates (Human Development) See: Caitlin Shimp

Chloe Bortmas (French) Session 2 #1, KHIC 013

Dr. Bertrand Landry Foreign Languages-French

Title: A Generation in Need of Feminism: A Comparison of Feminism in France and the United States

Abstract: Does the world really need feminism? In 2017, American women only make 80 cents per 1 USD, and hold only 19% of positions in political office. The same issues are true for other countries around the world such as France. French women make 26% less than men, and only hold 27% of positions in political office. In a society with such a negative connotation of feminism, is it even worth the fight? The goal of this research is to verify the necessity of feminism in the world today. The

research addresses the challenges that women face in most aspects of life that men generally do not. This is done by looking at the history of women before and after they could vote in the United States and France. By comparing the United States and France, this research focuses on women's oppression, which includes stereotypes, the gender gap, and the way females are seen in society. This oppression comes from many different sources such as figures in the media. The research is supported by current data and surveys from American and French citizens. Two surveys were created via SurveyMonkey in English and French. One hundred Americans and 100 French citizens responded to the survey. The data suggested the unjust treatment of women that is still alive today. For individuals who are fighting the gender gap and as a global society, this research and presentation are vital to understanding the need for breaking the stereotypes placed on women and gender inequality.

Robyn Brown **(Communication)** **Session 2, #3, T & H 100**

Dr. Malynda Johnson Communication

Title: Ask About Her Crossover, Not Her Pullover

Abstract: Embedded in our culture today is the habitual belief that regardless of talent, a female athlete remains below a male athlete in the hierarchy of sport. Despite decades of social reform and significant strides women have made in achieving parity, this age old challenge of equality continues to remain an issue in present times. The following items examined include television media coverage, print coverage, social media, and verbal dialect analyzed by gender. Women may have attained equal rights in 1920, but the invisible lines drawn to construct gender disparity remain observable 96 years later. In a spin on the famous ESPN segment Outside the Lines, I ventured inside them, to talk with our athletes. Regardless of their gender, how would a male react to questions that were often directed to females? And in return how did females react to the same inquiry? Women may still have a long road ahead in receiving the equal respect they deserve. But it's time now to initiate the conversation and cover the athlete for their skill, worth ethic, and passion, not their gender.

Meghan Byram **(Physician Assistant)** **Session 2, #3, EBB 203**

Vanessa Worley, MPAS, PA-C Physician Assistant

Title: Hidden Causes: Exploring Racism as a Factor in Negative Birth Outcomes

Abstract: Why are African American women at higher risk for negative birth outcomes compared to their white counterparts? Adverse birth outcomes include preterm delivery, low birth weight, infant mortality, and more. Previously, economic status and behavioral factors were identified as reasons for this health disparity. However, clinicians and researchers noted that healthy, college-educated African American women with prenatal care were still having negative birth outcomes at alarming rates. This prompted healthcare providers to consider hidden causes. A systematic review of literature was performed to try to decode this mystery. This review focuses on studies that investigate exposure to racism as a potential link to these negative outcomes. The research also examines how racism, a social problem, can be intimately connected to a biological process. Ultimately the project investigates how to

help African American women reduce this unfair and unjust risk. The pursuit of health equality is worth our effort and attention.

Alyssa Chuckalovchak (Psychology) See: Caitlin Shimp

Annissa Coley (Early Childhood Education) See: Alexis Parsons

Tatianna Carthorn (Interactive Media and Sport Business) Session 1, #1, T & H 100

Dr. Ivory Lyons Religion

Title: Praise Dancing and the Black Church

Abstract: The art of dance has the capability of bringing people together from diverse cultures, multiple generations and various backgrounds. At a young age the educational system has been teaching children dances such, the “Hokey Pokey” and “Ring Around the Rosy”, to help children obtain information more efficiently and better their overall ability to learn. Dance is one of the most powerful forms of non-verbal communication that has been around for hundreds of years used over various disciplines of life. Modern dance forms such as, Hip-Hop, Tap, Praise Dance, contemporary and spiritual, all have their own personality. Among those recent forms Praise Dance is truly a multicultural form of art. From the time of slavery, the Black Church used dance to relay messages of hope, faith and a form of celebration among themselves with dance forms such as “Ring Shout”. Within the Black church today dance forms such as creative, liturgical and, rhythmic praise dance still have the same purposes and convey the same message as it did since the very beginning. As the years move on the Black Church is looking to keep the tradition of Praise Dance but also stay connected to millennial generations.

Cyrena Cooper (Exercise Science) See: Kayla Ruffner

Emma Creech (Neuroscience) See Kaylee Krichbaum

Edward Cudjoe (Mechanical Engineering) Session 2, #2, T & H 100

Dr. Joshua Gargac Engineering

Other group members: Josh Marchese (Mechanical Engineering), Kenny Muhart (Mechanical Engineering)

Title: An Adaptable Interim Prosthetic Socket as an Alternative for Below-The-Knee Amputation Rehabilitation

Abstract: An interim prosthetic is necessary for proper rehabilitation after a transtibial or below-the-knee (BKA) amputation, but recent changes to Medicare reimbursement policies have created a barrier to their access. The overall goal of this project was to remove these barriers by creating an interim prosthetic that could be owned by rehab centers and then adjusted to fit individual patients. Specifically, this device must adjust to different residual limb sizes and localize pressures to tolerant areas. This project was completed following the engineering design process. At the onset, the current process for fitting an interim prosthetic was researched. Three adjustable socket concepts were generated, evaluated, and the best design was selected. A prototype was created, and its feasibility was tested. Sockets, molded from thermolyn europlex, include medical bladders, rigid urethane foam pads to adjust to each residual limb, memory foam for height adjustment, and a polyethylene terephthalate strap for suspension. These sockets will be included in a kit supplied to rehab centers. Included in the kit are sockets, aluminum pylons, wooden prosthetic feet, and connectors attaching the components. More than 100,000 BKAs occur each year in the US. This number is expected to increase to 58,000 by 2030. These amputees will recover at one of the 1,200 inpatient rehabilitation facilities, potential customers for the prosthetic kits, in the US. The adjustable interim prosthetic kits shift the paradigm away from many patient-owned devices to one clinic-owned prosthetic that can be disassembled and reassembled to fit patients with residual limbs of varying sizes.

Alana Dawson (Civil Engineering) See Julia Hessedence

Gretchen Dietz (Civil Engineering) See Julia Hessedence

Robert DeMarco (Mechanical Engineering) See Matthew Mulvihill

Bridget Dennis (Political Science) Session 3, #2, KHIC 013

Dr. Lori Kumler

Title: Exploring Links Between Institutional Racism and Party Voting Patterns in Three Ohio Counties, 2008-2016: Influence of Racial Gaps in Home Ownership, Infant Mortality, and Education

Abstract: Institutional racism describes established, systematic racial inequalities in the races usually including disparities in measures such as levels of education, health, income, and housing. In this study, I have investigated how well institutional racism can predict the percentage of residents in three Ohio counties voting for the Democrat party by asking “to what extent does a county’s dominant party in power have an association with the level of institutional racism in that county?”. Based on the literature, I hypothesize that counties with higher democrat vote percentages will have a lower level of institutional racism (measured by home ownership, infant mortality rate, and education level). I have analyzed data from the United States Census Bureau for three counties in Ohio including Cuyahoga, Franklin and Hamilton from 2008 through 2016, analyzing the gap between Whites and nonWhites. I have explored this claim by doing a multiple regression analysis to determine the association, and found

that for these three counties, my measures of institutional racism predicted 74% of the variance in voting for the Democrat party.

Brittany DiFiore (Exercise Science) See: Kayla Ruffner

Louis Ventura Duran (Psychology) Session 1, #3, EBB 203

Dr. Tamara Daily Psychology

Other group members: Daniela Garcia (Psychology), Michael Foster (Psychology), Greg Best(Psychology), Reilly Augustine (Psychology)

Title: Stress, Loneliness, Anxiety and Depression in College Students.

Abstract: First year domestic and international students face a great change when transitioning from high school to college. All students experience stressful situations that can have severe consequences such as developing anxiety and depression. In addition, both international and domestic students are vulnerable to loneliness. International students, however, face additional stressors such as acculturative stress and discrimination. Approximately 100 participants responded to an online survey containing 117 questions assessing stress, loneliness, anxiety and depression [SLAD]. It was predicted that international first year students would report greater levels of SLAD than domestic first year and non-first year domestic students, as well as non-first year international students.

Luke Engle (Mathematics) See: Michaelea White

Caitlin Fessler (Communication-Public Relations) Session 1, #2, KHIC 013

Dr. Malynda Johnson Communication

Title: Don't Wanna Catch Them All: Educating Students about STIs on a Small Campus

Abstract: Sexually transmitted infections (STIs) affect one in four college-aged students. In my study I surveyed 96 University of Mount Union students about their sexual health behaviors, their views of STIs, and how they believe the university communications with students about the risks of contracting an STI. The two thirds of students surveyed have never been tested before for STIs and have negative connotations about contracting an infection. The data suggests that though Mount Union students engage in safe sex practices using a barrier method, they are not aware of how or where to get tested or if the university offers any resources. As a public relations major, it is important to create messages that encourage and educate healthy lifestyles to better the lives of the communities we live in.

Michael Foster (Psychology) See: Louis Ventura Duran

Matthew Furda (Mechanical Engineering) See: Jon Stingel

Daniela Garcia (Psychology) See: Louis Ventura Duran

Katie Goedecke (Mathematics) See: Alexis Parsons

Kassandra Gibson (Japanese & Art) Session 3, #1, EBB 203

Dr. Margo Miller Art

Title: *The Process of Digital Animation: The Making of "Messenger"*

Abstract: How is an animation made, and how is it done on a computer? For my Senior Cumulating Experience, I created an original short story and animation influenced by my time spent abroad in Japan. Japan has a beautiful culture that is rich with powerful stories, myths, and legends. Furthermore, the field of animation is constantly evolving with new techniques that help bring artists' visions to life. Throughout this presentation, you will be walked through the process taken to create "Messenger" along with the cultural origins that influenced it. This presentation will explore the process of creating concept art and storyboards, as well as the final process of producing the animation. There is large amount of work done before any frames are even drawn. You will be introduced to the lore and myths that form the background for this animation, and will explore a very real Shinto shrine in Kyoto, Japan, called Fushimi Inari.

Sarah Gonda (History & International Affairs and Diplomacy) Session 2, #2, EBB 203

Dr. Theresa Davis History

Title: Two for the Price of One: The Evolving Role of the First Lady of the United States

Abstract: One of the most influential and overlooked positions in America is that of the First Lady of the United States. This office is unique like no other: she campaigns, but does not get elected, she is not appointed, nor does she swear an oath, she is not confirmed by the Senate, her duties are not outlined in any document, she works tirelessly, but does not get paid, and she has never been asked to resign or been fired. Despite these facts, there is undoubtedly much opinion from the press and the public on what they feel the role of this trusted advisor should be and how she should conduct herself. The modern day first lady is just as likely to travel to China as a representative of the United States as she is to pick out the china in the White House. A historiographic approach is taken to examine how the Office of the First Lady has evolved over time from a party planner to a political and humanitarian activist.

Garrett Graber (English) Session 1, #3, T & H 201

Dr. Michelle Collins-Sibley English

Title: Speaking From the Margins: History in the Fiction of Toni Morrison

Abstract: "Narrative is radical, creating us at the very moment it is being created." The beginning lines of American author Toni Morrison's Nobel lecture make a bold statement on the status of narrative: it shapes and is shaped by the individual. Narrative, and Morrison's understanding of it, is crucial when looking at her large body of work. It's even more important when looking at her preoccupations with history. Through an analysis of *Sula*, *Beloved*, and *A Mercy* using both narratology and post-structural theory, I argue that Morrison uses the medium of fiction to reveal the voices of Americans that have been systematically silenced in many Western historical narratives. Through revealing these voices, I explain how Morrison shows that the lives of the marginalized are crucial in understanding American identity and history. Ultimately, Morrison shows that narrative, and our understanding of it, is history. Every voice, even those not in plain view, shape it. And it shapes us.

Bailey Grimm (Human Development) See Kaylee Krichbaum

Stephanie Gross (Physician Assistant) Session 1, #1, KHIC 013

Vanessa Worley, MPAS, PA-C Physician Assistant

Title: Hashtags and Tweets: Social Media and Mental Health in Today's Teenagers

Abstract: Do you use social networking sites like Facebook, Twitter, and Instagram and think to yourself, "why does everyone have it so much better than me?" Social media plays an integral role in today's society as a means of staying in constant contact with friends, family, and the world, but how does all this screen time affect mental health? This study aims to discuss both positive and negative effects of using social networking sites and how these effects influence the mental health of teenagers and young adults. Through a systematic literature review, the research specifically examines aspects of mental health like depression, anxiety, and self-esteem. An evidence-based practice guideline is presented that can be incorporated into the medical care of this population. Current trends suggest there is a link between mental health and social networking site use, although much more investigation needs to be done before a direct relationship can be established.

Phillip Heskett (Mechanical Engineering) See: Jared Umstot

Meghan Hess (Exercise Science) Session 3, #2, T & H 100

Nathan Saunders Exercise Science

Other group member: Morgan Kiser (Exercise Science)

Title: The Minimum Detectable Change in Senior Fitness Testing Using Opal APDM Sensors

Abstract: 30 participants ages 65 years and older participated in three standard senior fitness tests while wearing opal APDM sensors. The sensors measure data from the three tests such as time to complete the test, gait speed, stride rate, and cadence. Senior fitness testing is often used to be able to assess the ability of a senior to live their daily life without assistance. Senior fitness testing is also used to assess fall risks and other injury risks that may pose a health issue for the client. The purpose of the research was not only to test the fitness levels in seniors, but to validate the sensors and ensure that they were reliable in every trial. In order to test validity of the sensors the minimum detectable change was calculated with the data from the trials. Minimum detectable change refers to the smallest change between the two trials the participant partakes in that can be detected beyond error and corresponds to noticeable change in ability.

Julia Hessedence (Civil Engineering) Session 1, #1, EBB 203

Dr. Yan Liu Engineering

Other group members: Jacob Ross (Civil Engineering), Gretchen Dietz (Civil Engineering), Clay Holsclaw (Civil Engineering), Alana Dawson (Civil Engineering)

Title: ASCE Mid-Atlantic Regional GeoWall Design Competition 2017

Abstract: Have you ever thought about using paper to hold back over 500 pounds of sand? Our project involved designing and building a model mechanically stabilized earth (MSE) retaining wall using paper. This project is a part of the Mid-Atlantic Regional Competition presented by the Geo-Institute of the American Society of Civil Engineers (ASCE). The goal of the competition was to design the lightest possible retaining wall to hold back 500 pounds of sand, a 50-pound bucket of sand that will be placed near the wall facing, and a 25-pound bucket held outside the box using piles. In order to come up with a design, the group performed experiments to determine the properties of the sand as well as the paper. Based on these results, the group designed the wall using standard MSE wall procedures to determine the width of reinforcement strips, spacing between reinforcement, and length of reinforcement. The group has tested various designs to determine the most lightweight and effective design to construct at the competition.

Clay Holsclaw (Civil Engineering) See Julia Hessedence

Gayle Kimbrough (MAEL) Session 3, #2, T & H 201

Dr. Jennifer Martin MAEL

Title: Access to honors, upper level, and Advanced Placement course for ALL students

Abstract: Students who are poor, African American, or multiracial at XXX High School are not proportionally enrolled in upper-level courses and/or recognized at Academic Awards ceremonies. Teachers are the primary gatekeepers for access to upper-level classes, and there is great concern that

implicit bias is hindering poor, black, and multiracial students from access to these classes. Additionally, Upper-level classes earn weighted grades which in turn impacts rank and overall grade point averages. If not all students have the same access to these course opportunities, I am concerned that those who are recognized with Academic Honors are not a fair representation of those students who have the ability, but not necessarily the access. In this study, I analyze demographic data from last year's upper-level courses as well as the demographic data of students who earned awards. I have a series of parent, teacher, and student action meetings where we will address how students access courses as well as course weighting and awarding students for academic honors. The goal of this study is to create an Action Plan that results in processes that create equitable access and awarding. My SPN has been focused on the importance of giving everyone a voice and creating equitable opportunities for marginalized people. I think this project aligns to my core belief about having access to educational opportunities and the importance that education can be in being the great equalizer of society.

Morgan Kiser (Exercise Science) See Meghan Hess

Diana Kloboves (Human Resources) Session 3, #2, EBB 203

Dr. Theresa Davis History

Title: Women and Whaling: How New England's Biggest Industry Affected Women

Abstract: From the mid-1800s to the early 1900s, the profession of whaling was alive and well, and was the backbone of New England society. Art forms captured the intensity of a whale hunt. Sailors were akin to celebrities. Economically, the industry of whaling was the foundation of the New England economy. The oil harvested from the whales powered New England homes, shops, and factories, making industry boom, and people wealthy. Factory owners, bankers, shopkeepers, and the captains of whaling ships were at the top of the New England social class. But where did women fit into this culture built on whales? Women were affected in unique ways by the whaling society. They were the wives of sailors, who waited by the docks to determine the fates of their husbands, the anonymous women whose faces decorated the bows of whaling ships, and even the unmarried girls who labored in the factories that processed the whales caught. There was also a lot of contradiction when it came to women and whaling. While women were considered bad luck and were often treated poorly by the sailors, at the same time, women were glorified for being mysterious. While women were not permitted to be sailors or in some cases, even be on board a whaling ship, the wealthy wives of ship captains were allowed to accompany them on whale voyages. Using information from New England's best historical societies, I learned that the industry of whaling impacted the lives of New England women because it somewhat objectified women, provided economic opportunities for women, and allowed women to challenge the gender roles of the time.

Kaylee Krichbaum (Human Development and Family Science) Session 2, #1, T & H 201

Dr. Kristine Turko Psychology

Other group members: Bailey Grimm (Human Development), Jenna Leighty (Human Development), Kori Trachsel (Human Development), and Emma Creech (Neuroscience)

Title: The Impact of Knowledge on Attitudes and Behavioral Intentions Towards Children with ASD

Abstract: This study investigated if and how knowledge about autism spectrum disorder (ASD) and exposure to information about ASD affect college students' attitudes towards and willingness to interact with children with ASD. Approximately 30 college students completed surveys assessing their prior knowledge of ASD. Attitudes and willingness to interact were assessed after the participants received different types of information about autism. We found no significant results; however, our findings still provide practical information on ways to reduce stigma towards children with ASD.

Jenna Leighty (Human Development) See Kaylee Krichbaum

Jacob Lawhorn (Mechanical Engineering) See: Jon Stingel

Terry Long (Japanese, Mathematics, and Mechanical Engineering) Also see Alexander McGinnis

Terry Long (Japanese, Mathematics, and Mechanical Engineering) Session 3 #1, T & H 201

Dr. Hamako Furuhashi-Turner Foreign Languages- Japanese

Title: Cultural Integration Japan: How to Survive and Thrive as an Engineer Abroad

Abstract: As the world progresses deeper into the 21st century, so too does the need for globalized engineers across the globe. By synthesizing and embracing cultural diversity in the workplace, it is possible to conceive and share new ideas from a distinct standpoint. However, globalization is not easily accomplished through basic interaction in a company; it is much more demanding and requires a thorough understanding of a country's norms and expectations to effectively work with one another. The United States and Japan are no exception to this rule, as both countries have their own unique culture and practices. In order to bridge the gap between cultural diversity, a careful analysis of American assimilation into Japanese culture was considered. This was accomplished by researching articles published in Japanese regarding contact theory using Japanese Manga for regional improvement, as well as understanding Japan's perspective of industrial globalization for engineering education. Other articles were published in English that provided insight on how foreigners may assimilate themselves in Japanese culture in addition to highlighting similarities and differences of engineering careers between the two countries. Will it be possible for a foreigner to assimilate themselves in a foreign land? Or is globalization not so important in modern times? This research aims to analyze both ends of this spectrum.

Taylor Lundy (Psychology) See: Caitlin Shimp

Josh Marchese (Mechanical Engineering) See Edward Cudjoe

Gaston Marian (Computer Science) See: Thomas Wines

Emily McConnell (Japanese and Writing) See: Thomas Wines

Alexander McGinnis (Mechanical Engineering) Session 1, #2, T & H 100

Dr. Josh Gargac Engineering

Other group members: Thomas Mohney and Terry Long

Title: Robotic Football Team

Abstract: Robotic football is an intercollegiate competition consisting of two main parts: an 8-on-8 competition and a skills combine consisting of six NFL style events. The goal of this project is to design a quarterback, wide receiver, and center to compete in this skills combine on March 25th at the University of Notre Dame. At the onset of the project, the designs of successful football robots were researched from previous competitions. Design alternatives were generated, and technical analysis was performed on each to optimize torque, speed, strength, and throwing accuracy. The robots were constructed using primary components such as HDPE sheet plastic, a Sabertooth motor driver, an Arduino Uno microcontroller, a Shorai lithium battery, and a P60 gearbox. Each robot is designed to serve a specific function, much like players on an actual football field. At the start of a play, the center “snaps” the ball to the quarterback using a single, actuating arm that pushes the ball into the throwing wheels of the quarterback. The quarterback then launches the ball to the wide receiver using a concept similar to that of a football passing machine. The wide receiver will catch the ball in a rectangular basket with a fabric exterior. The construction of these robots is the first step toward future participation in the 8-on-8 competition. Success in the robotic football competition will appeal to potential students and brand Mount Union’s engineering program as one of the most innovative in the country.

Thomas Mohney (Mechanical Engineering) See Alexander McGinnis

Cory Muller (MAEL) Session 3, #1, EBB 206

Dr. Jennifer Martin MAEL

Title: Project Based Learning vs. Small Group Instruction

Abstract: Project Based Learning is a widely used, criticized, and publicly discussed issue in education. Project Based Learning or PBL, is an effective and creative way to let students guide their own learning through projects. PBL in many early education settings is seen only as fit for the cognitively advanced. Small group instruction is a mainstay for how to get low functioning and average students to accelerate scores, and to make progress on standardized tests. This practice, while used by many elementary teachers, is not best practice for getting students to think creatively and create works of their own. PBL is a more exemplary instructional practice than small group alone for preparing students for an ever-changing society where creative thinking is necessary for success. To prove this, twenty-six students in a language arts class will be split into two groups: Small group instruction and PBL. Pretest and posttest will be taken by both groups and data will be collected. Students will also reflect on their experiences and a survey will be taken by all students to find common themes.

Kenny Muhart (Mechanical Engineering) See Edward Cudjoe

Matthew Mulvihill (Mechanical Engineering) Session 2, #3, EBB 206

Dr. Joshua Gargac

Other group members: Robert DeMarco (Mechanical Engineering), Durum Alarms (Mechanical Engineering)

Title: SkySweeping Vacuum Design Team

Abstract: At steel foundries like Timken Steel, the casting process generates large volumes of harmful dust. Exposure to this dust can pose a health concern to employees. Sky Sweeping, Inc. has been contracted to remove the dust and create a safe working environment. Currently, the dust is removed using a street-sweeping truck driven over walk ways and in between casting machinery. These sweeping vehicles use a system of brooms and filters that are not suitable for casting dust and deteriorate at a faster pace than normal. Replacing these components results in an annual maintenance cost of \$10,000. The goal of this project is to minimize the maintenance costs for our client and create an alternative solution. Through consultation with our client and conducting research a novel solution incorporating a series of two cyclonic separators was developed to remove dust and debris without filters. Technical analysis was performed to determine how efficient cyclonic separators would be, as well as how well the redesigned pickup head would perform. This was done in order to prove that the system that was designed would be functional if built. This technical analysis was then approved by a panel of industry engineers as well as professors from the University. During operation, an industrial fan creates a vacuum which pulls dust into a pickup head, through a flexible PVC pipe to the cyclonic separators. As the air flows through the separators, stone and dust particles develop angular momentum, and are dumped into a collection hopper. This new system will eliminate brooms and filters and is expected to reduce the SkySweeping expenses by thousands of dollars. In addition, this project also directs us into a niche market where the options for factory used sweepers are undersized and underdeveloped. Steel factories as well as other large industrial factories would be a great potential market for this type of system.

Alexis Parsons

(Mathematics)

Session 2, #2, T & H 230

Professor Stacey Cederbloom

Math

Dr. Melissa Askren-Edgehouse

Education

Other group members: Kayla Ashdown (Early Childhood Education), Kate Baker (Middle Childhood Education), Annissa Coley (Middle Childhood Education), Katie Goedecke (Mathematics), and Kristen Reihl (Mathematics)

Title: IT'S Math! Paving the Way for a Commitment to Professional Development among Mathematics Educators

Abstract: When was the last time you put math and fun in the same sentence? Are you looking to expand your knowledge about education within your field? As future teachers ourselves, we know how crucial professional development will be to our success throughout our careers. It was this mindset which led to the creation of our own Professional Learning Community (PLC) here at Mount Union. The PLC we created is called "IT'S Math!" which stands for "I Teach Students Math!" Its purpose is to provide an opportunity for UMU students to collaborate in an atmosphere that helps elementary, middle, and high school educators align mathematics content. Our goal in this presentation is to enlighten people about the benefits of starting a PLC for all professions. With a hands-on approach, we will explain the process of what it is like to plan and execute a PLC with the hope that it will inspire others to start their own. Together, let's make a difference in our educational community.

Ian Paxton (BioChemistry) See: Thomas Wines

Joseph Powell (Mechanical Engineering) See: Jared Umstot

Kristin Reihl (Mathematics) Also see: Alexis Parsons

Kristin Reihl (Mathematics)

Session 1, #3, EBB 206

Dr. Sherri BrughMath

Title: Squaring Off: The Quadratic Formula in an Arbitrary Field

Abstract: The formula for writing an equation of the form $ax^2+bx+c=0$ where a , b , and c are real numbers with $a \neq 0$ is widely known as the quadratic formula. Several methods exist for deriving the quadratic formula, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, in the traditional secondary mathematics classroom. What many are less-familiar with is the formula for solving such an equation where a , b , and c are elements of a more abstract algebraic system. This talk will explore quadratic equations in an algebraic system called a field and how the quadratic formula is derived in such a field.

Jacob Ross (Civil Engineering) See Julia Hessedence

Kayla Ruffner (Exercise Science) Session 2, #2, KHIC 013

Dr. Lonnie Lowery Exercise Science

Other group members: Brittany DiFiore (Exercise Science), Abbie Trivisonno (Exercise Science), Bridget Smith (Exercise Science), Cyrena Cooper (Exercise Science), Grant Slack (Biochemistry)

Title: The Effects of Instant Coffee on the Myotatic Reflex During Bench Pressing: A Gender Comparison

Abstract: Coffee is widely consumed by exercising men and women throughout the world. Previous work from our laboratory suggests coffee enhances the stretch reflex during bench pressing. Whether coffee differently affects reflexes in each gender during explosive exercise remains unclear, however. The purpose of this study was to compare the reflexes of the upper body between sexes after consuming different coffees. In a blinded, crossover experimental design, 34 resistance trained individuals were tested at 50% of their one repetition maximum (1RM) on the Smith Bench Press one hour after ingesting VIA or DCF. Force (FOR) and time to peak power (TtPP) were measured using the Smith machine and Ballistic Measurement System. Absolute bench press FOR was enhanced by prior stretch in the DCF condition in both sexes with larger enhancement after consuming VIA in men and in women. Statistical correction for body mass, however, abolished sex differences ($p \geq 0.05$). TtPP enhancement from prior stretch tended to differ in the DCF condition in men and in women. This trend reached statistical significance only after consuming VIA in men and in women. We conclude that the stretch reflex enhances explosive bench press performance in both sexes with men gaining greater absolute gains than women, particularly after coffee consumption. Future studies that compare sexes in the bench press are cautioned to adjust force measures for body mass differences.

Katherine Schulman (MAEL) Session 3, #3, EBB 203

Dr. Jennifer Martin MAEL

Title: Using Mindset to Improve Student Academic Performance, Attendance, and Attitude

Abstract: Research on fixed versus growth mindset is currently very influential in the field of education. In a fixed mindset students believe their basic abilities, their intelligence, their talents, are fixed and unable to improve. These individuals spend their time documenting their intelligence or talent instead of developing them. Those with growth mindset believe that their most basic abilities can be developed through dedication and hard work, and they view a challenge as an opportunity to learn. Many students in the Emotional/Behavioral Resource Room grades five to eight tend to exhibit a fixed mindset, believing their success is based on innate ability. People whom exhibit a growth mindset believe their success is based on hard work, learning, and training. In this study, I monitored and analyzed students' attitudes through their use of negative comments they verbalized about their ability, conducted a pre-survey, examined student attendance, and grades. Students were then exposed to research, activities, and information about the growth mindset versus fixed mindset as an educational intervention. Finally,

students' grades, attendance, and attitude were monitored post-intervention to determine if changes in mindset and performance occurred.

Megan Semans (Physician Assistant) Session 2, #1, EBB 206

Vanessa Worley, MPAS, PA-C Physician Assistant

Title: Equine-Assisted Therapy and Children with Cerebral Palsy: Effective or Just Horseplay?

Abstract: Each year, approximately 10,000 babies in the United States are born with cerebral palsy (CP). CP, the most common childhood physical disability, is a congenital disorder characterized by permanent, life-long physical disabilities of varying severity, including impaired movement, muscle tone, and posture. Much research has been conducted to identify the most effective treatment methods for CP. This study addresses if equine-assisted therapy (hippotherapy) should be recommended for children with CP and which patients are likely to derive the most benefit. A systematic review was conducted to investigate studies addressing the effects hippotherapy had on gross motor function, balance, different severities of CP, and more. Findings suggest hippotherapy should be recommended as a treatment option for children with CP. Providers, physical therapists, and families of children with CP considering treatment options can all benefit from this research. Which specific impairments, type and levels of CP respond best? Come find out!

Caitlin Shimp (Psychology) Session 2, #2, EBB 206

Dr. Tamara Daily

Other group members: Tae'Lor Windham (Psychology), Taylor Lundy (Psychology), Alyssa Chuckalovchak, (Psychology), Taylor Bates (Human Development)

Title: Effect of Minority Status on Stress, Attitudes toward 1st Year Programming, and Retention

Abstract: In this experiment, we investigated how first year racial/ethnic minority and non-racial/ethnic minority students in their second semester differ in terms of persistence/retention, perceptions of Exceptional Beginnings programming, minority stress and general student stress in academic, social, and financial domains. The questionnaire consisted questions from the College Stress Inventory, the Black Student Stress Inventory, and the Student Adaptation to College Questionnaire. In addition, participants responded to questions assessing their perceptions of the Exceptional Beginnings Program. We predicted that first year racial minority students would be less likely to express an intention to return to the university in the fall and more negative perceptions of Exceptional Beginnings programming, but higher levels of minority and general stress in comparison to non-racial minority students. Out of the 131 completed responses, our results confirmed our hypotheses, and indicated multiple intercorrelations among our variables as well. Indicating an importance for student affairs professionals to expand such research at other predominantly white institutions. Other implications of the results and future research will be discussed.

Clinton Simmons (Political Science) Session 1, #2, EBB 203

Dr. Lori Kumler Political Science

Title: Student Opinion and Rape Policy: Do the policies reflect the attitudes of the students they are meant to protect?

Abstract: From presidential debate stages to college campuses, topics of sexual assault and rape are increasingly making headlines. Regarding college campuses, I investigated the extent to which students felt protected by current rape policy and their recognition of rape culture's prevalence on their campus. Democratic theory would suggest that we choose representatives who will keep us safe. Mood theory, the Spiral of Silence, and my "Subcultural" Spiral Model, however, suggest that we may not always express our opinion to affect policy. My case study approach to exploring this question on the University of Mount Union's campus included 135 surveys distributed to students in randomly selected general education courses. Various regression analyses and an association test yielded both surprising and expected results: Greek organization members were more aware of the prevalence of rape culture compared to non-members, while non-athletes seemed to feel less protected by policies and more aware of rape culture than athletes. As expected, women felt less protected by policies and more aware of the prevalence of rape culture. These results have relevance for educational policies on college campuses regarding rape and provide insight to the extent to which various subcultures feel their needs are met by current policies.

Grant Slack (Biochemistry) See: Kayla Ruffner

Bridget Smith (Exercise Science) See: Kayla Ruffner

Jon Stingel (Mechanical Engineering) Session 1, #1, EBB 206

Dr. Joshua Gargac Engineering

Other group members: Jacob Lawhorn (Mechanical Engineering), Matthew Furda (Mechanical Engineering)

Title: The Brew Crew Hop Harvesting Machine

Abstract: The hop brewing industry continues to prosper in the United States, increasing the demand for hops. Large-scale farms are highly efficient, using expensive machines to harvest the hops, but smaller operations cannot afford to invest in these machines and are limited to hand picking. The owner of a small hop farm in Tennessee has sponsored the development of a low-cost hop harvester meant to increase the harvesting speed of smaller hops farms. At the onset of the project, contemporary harvesting processes were researched and identified as involving two main tasks: stripping the bines and sorting the hops. The first, stripping, can greatly be improved and was selected as the focus for the first phase of the project. Designs were created and evaluated based on their power requirements, estimated efficiency, and size. As designed, the stripping mechanism consists of two metal rollers with metal-wire fingers that pluck the cones from the plant bine. The mechanism is supported by a box metal frame, ensuring it is easily configurable with the future sorting section that will be designed. To test the

machine, the team will measure the rate cones are removed from a bine while evaluating the damage done to cones; maximum strength of the shear pin in the stripping mechanism will also be evaluated. This hops harvester is multi-year project meant to satisfy industry requirements and meet the needs of a client. In doing so, the harvester has high marketability to hops farmers supplying the craft beer industry.

Kori Trachsel (Human Development) See Kaylee Krichbaum

Abigail Trivisonno (Exercise Science) Also see: Kayla Ruffner

Abigail Trivisonno (Exercise Science) Session 2, #1, T & H 100

Dr. Ronald Mendel Exercise Science

Title: The Effects of Gender and Rest Interval on Post-Activation Potentiation in Vertical Jump Performance

Abstract: Post-activation potentiation (PAP) is a known phenomenon that causes an increase in muscular contractile force after a preceding contraction. This allows for an increase in muscular force which temporarily improves explosive movements executed within the muscle groups that were potentiated. However, there is conflicting research concerning the impacts of gender on PAP as well as the duration of PAP effects. The purpose of this study is to examine the impacts of gender and rest interval on PAP during the vertical jump following a maximal voluntary contraction (MVC). It was hypothesized that no differences would exist between genders in response to PAP. Subjects are still being recruited but will likely include twenty college students (10 male and 10 female), ages 18-23 yrs. Male subjects were recruited on a basis of a $1RM \geq 1.75x$ body weight and female subjects were recruited on a basis of a $1RM \geq 1.5x$ body weight. Only strong subjects were recruited due to previous research that suggests they have an improved reaction to PAP (Suchomel et al. 2015). Subjects attended two sessions; a familiarization session and a testing session. During the testing session subjects completed three baseline verticals followed by an 8s MVC and verticals at 10s, 4 min, and 8 min post-MVC. Jump height, flight time, and peak power were recorded from a jump mat via KMS. Data collection is currently taking place and will be analyzed using a three-way ANOVA with an SNK post hoc as needed (IBM SPSS Statistics Version 24).

Jared Umstot (Mechanical Engineering) Session 2, #1, EBB 203

Dr. Joshua Gargac Engineering

Other group members: Joseph Powell (Mechanical Engineering) and Phillip Heskett (Mechanical Engineering)

Title: SAE Baja Suspension System

Abstract: Baja SAE is an intercollegiate design competition for which engineering students design and build off-road vehicles. Each vehicle must pass a rigorous inspection process before competing in dynamic events meant to test the durability of the design. These dynamic events consist of maneuverability, suspension, acceleration, braking, and either hill climb or sled pull. The competition then culminates in a four-hour endurance race. The overall goal of this project was to improve the vehicle's performance in these events by redesigning its suspension, the components used to connect the frame to the wheels and provide an interface for proper handling and maneuverability. The project was completed using the engineering design process. First, suspension designs from other Baja teams as well as commercially available vehicles were researched. Design concepts were then generated from this research. Engineering simulations were conducted using SolidWorks in order to evaluate the concepts and make iterations. As the primary constraint, the new suspension had to both fit the current vehicle frame and reduce the vehicle's overall weight, while still retaining handling characteristics. As designed, this new suspension system is 20% lighter and increases the vehicle's suspension travel. The Raider Racing Baja Club will compete at two competitions: Baja Kansas on May 25-28, and Baja SAE

Illinois on June 7-10. The completion of this project will increase the Raider Racing Team's chances of improving upon the 34th overall finish in the race at Tennessee Tech in 2016.

Michel Vasiladiotes (Physician Assistant) Session 3, #1, T & H 100

Vanessa Worley, MPAS, PA-C

Physician Assistant

Title: When Time Is a Matter of Life or Death: Is Telemedicine the Answer in Acute Stroke Care?

Abstract: Tick tock. Every 40 seconds, someone in the U.S. has a stroke; and, every four minutes, someone will die of stroke. Time is often an essential factor in what determines full recovery, debilitating deficits, or death in patient outcomes. Unfortunately, the availability of skilled neurologists and vascular surgeons is not within reach for many, especially in rural settings. Telemedicine has become an integral part in increasing accessibility and reducing mortality with acute stroke. However, many questions remain regarding telemedicine best practices, its efficacy in long-term patient outcomes, and the role of prehospital care. A systematic review of literature published within the last six years was conducted to address such questions and propose an evidence based best practice guideline for the use of telemedicine in acute stroke care. Is telemedicine the answer in acute stroke when help seems out of reach and seconds count? Time will tell.

Michaelea White (Education) Session 1, #2, T & H 201

Dr. Ernest Pratt Education

Other group member: Luke Engle (Mathematics)

Title: White Privilege

Abstract: Our presentation starts off with introducing the origin of the term 'White Privilege', and how big of a role Peggy McIntosh had in defining the term 'White Privilege'. To start off the presentation we showed a video of what normal everyday people believe white privilege is, showing comparisons between races, genders and cultures. Then we talk about the National SEED Project and its impact on education. We then define what the National SEED Project is--"The National SEED project is a peer led professional development program that creates conversational communities to drive personal organizational and societal change toward greater equity and diversity". SEED stands for Seeking Educational Equity and Diversity, to create a gender fair, multiculturally equitable, and globally informed education. We talked about how teachers can incorporate SEED into their curriculum by developing a more inclusive discussion based classroom, this gives students the opportunity to discuss their cultural background openly without judgement. As well researching the National SEED Project we also looked at personal accounts of people who have attended the

conferences and their experiences there. Then we should statistics and facts related to white privilege, using those facts to lead discussion and giving audience opportunity to tell their experiences. To wrap up our presentation we opened up the room for any questions and discussion.

Brianna Whittaker (National Security- Foreign Intelligence) Session 2, #3, KHIC 013

Dr. Lori Kumler Political Science

Title: Incentivizing Presidential Debate Watch Events

Abstract: Given the intense political season of 2016, we wanted to investigate whether incentivizing debate watch events on campus would increase attendance at these events, and, furthermore, we wondered to what extent watching the debates would increase students' political efficacy and engagement. Specifically, we targeted Greek Life on campus and offered incentives for chapters with the highest attendance. The research conducted included a survey sent out to all Greek Life members examining whether students registered to vote, voted, participated in conversations about the election, and whether they felt an increased sense of political efficacy. Statistical analyses indicated that 47% of those who attended the debate watch events would be very unlikely or unlikely to have watched the debates on their own, showing that hosting debate watch events is of benefit to students. Furthermore, watching the debates was the strongest predictor of voting, registering to vote, and the amount of conversations students had regarding the election. Finally, follow up interviews with select students provided additional qualitative data. From these results we recommend that colleges and universities consider hosting debate watch events as one of many tools to promote student participation in the political process.

Tae'Lor Windham (Psychology) See: Caitlin Shimp

Thomas Wines (Biology) Session 1, #3, KHIC 013

Dr. Jennifer Martin (MAEL)

Other group members: Peter Young (Mathematics), Ian Paxton (Biochemistry), Emily McConnell (Japanese and Writing), and Gaston C. Marian (Computer Science)

Title: Interest, Influence, and Intersectionality: Freedom of Choice or Cultural Expectations?

Abstract: By disseminating a general survey and proctoring personal interviews with students, we seek to attain a clearer understanding of how undergraduate students' racial or gender identity may shape the kinds of pressures they feel by teachers, parents, and peers to pursue a specific field of study.

Peter Young (Mathematics and Physics) See: Thomas Wines

POSTERS

Note: Abstracts are for web-site only and are not printed in the brochure.

A special musical performance by the PHY254: Science, Sound and Music class, taught by Dr. Bob Ekey will take place near the end of the afternoon poster session in Bracy Hall. The “orchestra” includes: **Tristan Begue (Mechanical Engineering), Ian Dilyard (Physics), Grant Donnelly (French and Physics), Zachary Dozier (Mechanical Engineering), Morgan Hamilton (Biochemistry), Cole Harvey (Mechanical Engineering), Phillip Heskett (Mechanical Engineering), Benjamin Kelley (Mechanical Engineering), Marcus Kinnard (Mechanical Engineering) Garrick Koermer (Chemistry) Jacob Lawhorn (Mechanical Engineering), Joshua Leiter (Mathematics and Physics), Matthew McMinn (Computer Science), Kenneth Muhart (Mechanical Engineering), Matthew Mulvihill (Mechanical Engineering), Joshua Palcheff (Computer Science and Mathematics), Joseph Powell (Mechanical Engineering), Cameron Senhauser (Mechanical Engineering), Ryan Studer (Mechanical Engineering), Nicholas Tkacik (Mechanical Engineering), Raphael Tshikala (Physics), Erin White (Mathematics and Physics), and Peter Young (Mathematics and Physics).**

Abstract: The course Science, Sound and Music examines the science of sound, music and acoustics: exploring ideas including how sound is produced and perceived, the creation and interpretation of music, the influence of room design on its acoustics, and how musical instruments work. Throughout the semester, students explore these concepts from a scientific and aesthetic perspective integrating their own personal experiences with ideas from several disciplines including physics, music, and psychology. The final project for the course brings it all together, with each student designing, building and performing a musical instrument. This public performance will be the first and last time for this ensemble and these instruments. Feel free to ask the students about their instruments following the performances.

Courtney Berish (Biology)

Dr. Charles McClaugherty Biology

Title: Cyanobacteria Counts at Walborn Reservoir: Implications for Recreational Use

Abstract: Walborn Reservoir is a part of the Mahoning River watershed and also used as a source of drinking water for Alliance, Ohio. Along with providing drinking water to the city, it is highly used for recreational activities such as fishing and boating. Cyanobacteria, also known as blue-green algae, may contain various toxins that can accumulate to potentially hazardous concentrations. Because blue-green algae have the potential to produce these hazardous toxins, most health impacts, in terms of recreational use, have been correlated with Cyanobacteria rather than other freshwater algae species. Many of these toxins are associated with human and animal sickness. Working with Stark Park's natural

resource manager, Thomas Prewitt, the project was to determine the health of the water in terms of recreational use. Three locations were sampled within Walborn Reservoir, based on the most recreational activity. One water sample was taken at each location at about three feet depth. Samples were collected once a week and analyzed that day. The sample was gently stirred in the collection container then 1mL was pipetted off of the top of the sample and put into a Sedgwick Rafter slide where it sat for 15 minutes before reading. Using an inverted scope, the sample was read by using 10 grids at 10X. The counts were recorded for each of the 10 grids on an algae counting record paper provided by the Alliance Water Treatment Plant. The total number was added from each of the grids and multiplied by 100 for results/ml and then multiplied again by 1000 to get results/L. A compound microscope was used when identification aid was needed. The results showed the presence of five blue-green algae species. The two most common were Planktothrix and Oscillatoria. The total number of algae in each of the locations combined produces a relatively low number for the risk factor set by the EPA. Therefore, the water could be deemed healthy and safe for recreation. Ecology is important because it provides examples in which people and nature depend on one another. Understanding ecological systems can allow for predictions about the ways human activities affect the health of the environment.

Alexandra Colacino (Exercise Science)

Dr. Nathan Saunders Exercise Science

Other group member: Alyssa Braun (Exercise Science)

Title: Cross Sectional Analysis of Senior Fitness Testing

Abstract: It is important to understand how fitness changes with age, in order to have an idea of what is considered normal. It is known that as age increases, fitness declines, but there is very little information on how turn duration, step duration, and sit-to-stand and stand-to-sit durations change with age. The purpose of this study was to determine if there are any significant correlations between age and turn duration, step duration, sit-to-stand duration, and stand-to-sit duration. A total of 9 participants, both male and female, from the Alliance area were recruited for this study. Participants were age 65 and older, had no known cognitive or balance disorders, and were able to walk without the help of an assistive device. Participants completed three tests, a Chair Stand, 8 Foot Up-and-Go and 6-Minute Walk Test, which are part of the Senior Fitness Test (SFT). Each participant wore APDM opal sensors (positioned at the wrists, tops of the feet, lumbar spine and sternum) in order to collect, store and analyze data [2]. Each opal sensor consists of a tri-axial accelerometer, tri-axial gyroscope and tri-axial magnetometer [3]. Each participant's step duration, turn duration, sit-to-stand duration, and stand-to-sit duration from trial 1 was compared to age. Associations between age and fitness parameters were assessed using Pearson's Product Moment Correlation Coefficient.

Erica DeAngelo (Physician Assistant)

Vanessa Worley Physician Assistant

Title: Hello! ¡Hola! Bonjour! Nǐ hǎo! The Bilingual Brain: Can Learning a Second Language Help Delay Dementia Later in Life?

Abstract: Dementia is a degenerative disease marked by progressive cognitive decline that is often devastating for the person and family members of that person. According to the World Health Organization, dementia affects 35.6 million people worldwide, a number projected to triple by the year 2050. With no current cure available, prevention remains our best defense. This systematic review of literature evaluates growing research on the topic of second language acquisition delaying the onset of dementia. Publications from peer-reviewed journals over the last 10 years were critically analyzed and are presented here in an effort to devise a practice guideline as it relates to dementia prevention. Can learning a second language delay the onset of dementia? If so, at what age would someone have to learn the second language for him/her to derive the benefit? Come find out what the evidence shows. The answer is complicated but exciting and very promising.

Andrew Decker (Biology)

Dr. Charles McClaugherty

Title: Mycoremediation of Crude Oil Contaminated Soil by the White-Rot Fungi *Pleurotus ostreatus*

Abstract: Over the past half century, increases in contamination have caused a buildup of harmful substances in the soil. Processes of effectively remediating contaminated soils on site are not common or cost effective. Mycoremediation is the process of using fungus to naturally remediate contaminated soil at the site of contamination. A group of fungi, the white-rot fungi, can decompose wood. Due to similarities between the chemical structures of wood and crude oil, some white-rot fungi effectively degrade crude oil in soil. The fungus *Pleurotus ostreatus* was added to tubes of crude oil contaminated soil in concentrations of 0%, 10%, 20%, and 25% by weight. The Li-Cor LI-6400 XT IRGA was used to measure the respiration rate of each tube. Total Hydrocarbon count using Gas Chromatography Mass Spectrometer was measured before the fungus was added and after the test period was over. The goal of this research is to find which concentration of oil in soil is most effective for degradation by the white-rot fungus. It was found that the 10% concentration had the highest average respiration rate during the test period, however there was no significant statistical difference between the average respiration rates of the 10% and 20% concentrations.

Ryan DelBene (Physician Assistant)

Vanessa Worley Physician Assistant

Title: Are Pests Best? Examining the Use of Maggots in Treating Diabetic Foot Ulcers

Abstract: With seemingly endless advances in medical technology and research, it is alarming to see cases of non-healing wounds continue to rise. Diabetic foot ulceration is of particular concern as diabetes mellitus is expected to affect over 500 million people worldwide by 2030, and because the ultimate consequence of non-healing diabetic foot ulcers is often amputation. Today, the standard of care for chronic wounds is surgical debridement, creating a fresh wound through the removal of damaged tissue. There are several nonsurgical forms of debridement, including the application of maggots to the wound to feed off dead skin. Recent research suggests that this biologic form of

debridement not only heals the wound as efficiently as surgical methods, but also provides disinfectant properties. Considering that antibiotic resistance is on the rise and surgery presents risks, it's time to put aesthetics aside and consider maggot debridement therapy a legitimate option for diabetic foot ulcers.

Brittany Difiore (Exercise Science)

Dr. Ronald Mendel Exercise Science

Other group member: Rebecca Rector (Exercise Science)

Title: The Effects of Caffeine on Recovery in a Total Knee Replacement: A Retrospective Study

Abstract: Caffeine is a commonly consumed substance with known performance enhancing and analgesic effects. It has been used in both endurance and high-intensity short exercise bouts to improve performance. Recent research suggests possible effects of caffeine in relation to recovery for a total knee replacement (TKR). These effects could lead to the ability of a patient to increase their performance in a physical therapy program when recovering from a TKR. This increased ability in performance could ultimately decrease the amount of time spent in a physical therapy program, leading to a faster rate of recovery, which could lead to potential cost saving benefits. Data from 18 patients (9 females and 9 males) was collected through University Sports Physical Therapy. Patient demographics along with approximate coffee consumption, range of motion, manual muscle test, and pain were recorded. Data analysis has not been completed at the time of submission.

Ian Dilyard (Physics)

Dr. Bob Ekey Physics

Title: The Dynamics of Bowling

Abstract: Bowling is hardly as simple as it may seem. For professional and amateur bowlers alike, understanding how and why a bowling ball behaves a certain way is critical in choosing the right equipment. To do so, we need an in-depth physical and mathematical analysis of everything from the core of the ball to the lane it travels down. A bowling ball was cut open to examine its internal structure. We discover that the behavior of the ball can be predictable if we know key properties of the ball and the lane.

Uriel Iberra-Moreno (Exercise Science)

Dr. Nathan Saunders Exercise Science

Other group members: Abigail Matsushima (Exercise Science) and Kennady Miller (Exercise Science)

Title: Validity of Wireless Sensors for Assessing Senior Fitness Test Measures

Abstract: In the cross sectional analysis for Senior Fitness Testing we will use APDM Opal sensors to measure and collect data of three tests, including a 30 Second Chair Stand Test (30 s CST), an 8 Foot

Timed Up-and-Go (8 ft TUG), and a 6 Minute Walk Test (6MWT). We will be analyzing the validity of the sensors by using stopwatches and observation during each test. The importance of validating this equipment is to potentially eliminate human error in data collection during testing. When reviewing the literature, we found one study analyzing the validity of Opal sensors used during an 8 ft TUG. Testers found a strong correlation between the timing of Opal sensors and timing using a stopwatch. However, the Opal sensors were found to overestimate the time-to-completion by approximately 2 seconds longer than when using the stopwatch. This was due to the Opal sensors detecting different starting and ending points. Another study showed that the use of sensors allows for a more in-depth and accurate data collection during testing. Not only do sensors keep track of time as a stopwatch would, but they also make specific observations such as arm swing, lean angles, foot-to-ground contact duration, and many more measures that are difficult to record with the naked eye. These specific observations serve to be especially useful when implementing interventions for rehabilitation. A total of at least 30 participants, including both males and females, will be recruited for this study. The participants should be older adults, age 65 and up, and should be apparently healthy with no known cognitive or balance disorders. They should also be able to walk unassisted. Participants will be recruited from the Alliance area from places such as churches, YMCAs, community centers, and independent living facilities. Participants will complete three tests; those including a 30 s CST, an 8 ft TUG, and a 6MWT. These three tests are protocols originally created by researchers Rikli and Jones., but have been altered to fit the research protocol that is to be conducted. Testing will be conducted in a long hallway measuring at least 25 m in length. For the 30 s CST and the 8 ft TUG, a chair of 17 inches in height will be used. Six APDM Opal sensors will be placed on the participant. They will be positioned on both wrists, the top of both feet, lumbar region, and chest. The sensors will collectively measure the participant's movements and give us data from each test performed. To determine the validity of the sensors, the testers will use stopwatches and observe the participants as they perform the tests. For the 30 s CST, the tester will record how many times the participants go from a seated position to a standing position with knees fully extended in 30 seconds. A stopwatch will be used for the 8 ft TUG, wherein time will be recorded from when the tester says "go" to when the participant returns to their initial seated position. The stopwatch will also be used for the 6MWT and will provide the information to calculate the total distance traveled, gait speed, and stride rate. By timing the tests manually with stopwatches, we will be able to validate the data collected and the accuracy of the APDM Opal sensors. The total distance traveled will be determined by counting the number of laps each participant is able to walk back and forth along the 25 m area in 6 minutes and multiplying it by gait speed. Gait speed will be calculated by using a stopwatch during the middle 20 m of the 25 m walkway (to eliminate the acceleration and deceleration phases). Stride rate will be determined by timing how long it takes to complete 10 consecutive strides. Then, a relative agreement between the APDM system and manual data collection will be made using Pearson Product Moment Correlations and any significant differences between the two will be assessed with paired sample t-tests.

Peyton Kranz **(Exercise Science)**

Dr. Ronald Mendel

Title: The Effect of Swimmer's Posture on Core Strength in Collegiate Swimmers

Abstract: The purpose of this study is to examine the connection between posture and core strength in collegiate swimmers. Specifically, this study helped gather data to assess if poor posture affects an individual's core strength. The posture assessed was whether or not the subject has Swimmer's Posture, which is defined as: forward head position, rounded shoulders, a back deformity (kyphosis, lordosis, scoliosis, flat back), and an anterior pelvic tilt. Determining the connection between posture and core strength could have practical applications in injury prevention for swimmers since the core serves an integral role in stability, energy transfer, and maintenance of posture (Kibler et al. 2006; Oliver et al. 2010). This information could also be helpful in creating more effective training methods for swimmers. Data collection for this study included postural assessment and core strength assessment for all subjects. Subjects took a picture behind a plumb line from multiple angles, and those pictures were sent to a physical therapist for postural analysis. Core strength was assessed via four separate core strength tests with one-minute rest between each test. The tests involved were: double leg lowering test, prone plank, non-dominant side plank, and dominant side plank. Subjects were separated into two groups: those with swimmer's posture, and those without. The core strength test results from each group will be compared to see if those with swimmer's posture have weaker cores than those without swimmer's posture.

Kaylee Krichbaum (Sociology)

Dr. Kathleen Piker-King Sociology

Title: Interning with a School-based Therapist

Abstract: Internships give students valuable practical experience that allows them to learn information about their chosen profession that may not have otherwise been available to them. This poster details one student's sociology internship completed with a school-based social worker. Among other information, the poster describes the history of school-based counseling, the responsibilities of the internship, coursework that relates to the internship, the skills gained during the internship, and the prospective career the student chose as a result of her internship experience.

Megan Kurz (Chemistry)

Dr. Carolyn Reid Chemistry

Title: Synthesis of Antioxidants to Improve Stroke Treatment

Abstract: Stroke has impacted millions as the 5th leading cause of death in the United States resulting in billions of dollars spent for care annually. The only FDA approved treatment is expensive and has multiple side effects, therefore the demand for new therapeutics is urgent. After a stroke, there is an over production of free radicals in the body which causes cellular damage and loss in brain function.

Recent studies show that antioxidants such as resveratrol can improve brain function in patients by removing these free radicals from the body. In this research, a number of molecules were synthesized with structures related to resveratrol. These new compounds could enhance current treatment by protecting the brain from free radical damage in a safe and effective manner.

Lauren Liegl (Physician Assistant)

Dr. Vanessa Worley Physician Assistant

Title: Put a Little Faith in the Human Papillomavirus Vaccination

If an anti-cancer vaccine existed, would you want to receive one? Human papillomavirus (HPV) is a virus that is transmitted through sexual activity including sexual intercourse and oral sex. If it is not identified early, the virus can lead to cancer. It is associated with 100% of cervical, 90% of anal, and 50% of penile cancer cases. A vaccine for HPV exists, but it is not widely utilized by at-risk populations. It is recommended that children ages 11-13 receive the vaccine, so it is usually the guardian's decision to vaccinate. To better understand why it is not being utilized, a systematic review of HPV vaccination studies was conducted. The research concludes that there is a lack of education on behalf of clinicians addressing religious and cultural reasons for not vaccinating. Come find out just how important the HPV vaccination is and make the decision for your own health!

Jacob Mamula (Exercise Science)

Dr. Ronald Mendel Exercise Science

Other group member: Jake Tremoulis (Exercise Science)

Title: The Effects of Supplemental Fucoxanthin on Resting Energy Expenditure in Overweight/Obese, Nondiabetic, Premenopausal Women.

Abstract: Fucoxanthin, a marine carotenoid (organic phytochemical) derived mainly from brown seaweeds, is well-researched in rodents for its anti-obesity and anti-diabetes effects, but remains under-researched in humans. Reported effects include enhanced lipolysis, reduced lipogenesis, increased activity of lipolytic enzymes, increased expression of β 3-adrenergic receptors and uncoupling protein 1 in white adipose tissue, improved insulin resistance, and improved adipokine expression and plasma levels. These effects imply impressive potential for fucoxanthin as an anti-obesity and anti-diabetes nutraceutical. Accordingly, further human subject research is needed to gather evidence for its efficacy in humans. In this study, we investigate the effects of fucoxanthin on resting energy expenditure, determined by measuring oxygen consumption using indirect calorimetry. Secondary measurements include body composition, determined by measuring air displacement using the BOD POD, and fasting blood glucose, determined using the OneTouch UltraMini Blood Glucose Monitoring System. We measured baseline values for each of these variables, provided the supplement (20 mg/day) to the experimental group and placebo to the control group, and the variables will be remeasured after 7-weeks of supplementation. Currently, data collection is still underway. Experimental and control group

data will be analyzed to determine physiological effects and statistical significance, and then, we will make conclusions.

Emily McConnell (Japanese and Writing)

Dr. Gwen Schwartz Writing

Title: Gender, Number & Singular They

Abstract: Despite a growing understanding of gender, recent grammar resources still advocate that singular “they” is wrong. However, English speakers have historically used singular “they” and still use singular “they.” To investigate how far we’ve come, this researcher examined 8 grammar resources, analyzing pages discussing singular pronoun use. The results show we still have a long way to go. But people’s use of language is what causes change. This presentation will examine the implications of these sources and how people can change English by using respectful, inclusive language.

Samantha Meluch (Public Health)

Dr. Kathleen Piker-King Sociology

Title: Child Fatality Review in Stark County: Internship Experience at Stark County Health Department

Abstract: As infant and child health continues to be a high priority for Public Health professionals, many programs and services have gone into effect throughout the nation to combat the alarming rates of infant and child mortalities. Specifically, in 2000, the Ohio General Assembly passed a law that mandated that all counties in Ohio have a Child Fatality Review Board to review all of the deaths of children aged zero months to eighteen years. Once reviewed, the Child Fatality Review Board collaborates together in order to determine if the deaths could have been prevented and what can be done in the future to prevent the deaths from continuing. During an internship at Stark County Health Department in the Fall of 2016, deaths that occurred in Stark County during 2016 were reviewed and it was found that the 2016 rates have exceeded previous years. Through investigation and research in the deaths, evidence has shown that age of the parents, race, and socioeconomic status play large factors in determining infant and child mortalities.

Andrew Paleno (Physician Assistant)

Vanessa Worley Physician Assistant

Title: Major Depressive Disorder: Is There an Association with Vitamin D Deficiency?

Abstract: Do you or does someone you love suffer from depression? More than 14.8 million individuals in the US live with major depressive disorder. Many studies show a correlation between vitamin D deficiency and depression. The current study aims to answer if patients with major depressive disorder should be screened for vitamin D deficiency, and investigates future implications for treatment. This literature review was conducted with the goal to produce an evidence-based practice guideline for

providers. Studies continue to show a relationship between these two common conditions. In fact, individuals with major depressive disorder and vitamin D deficiency tend to have more severe depressive symptoms including suicidality compared to depressed patients without the vitamin deficiency. Furthermore, when vitamin D is supplemented, patients with depression report improvement in depressive symptoms. For these reasons, I conclude that vitamin D deficiency should be recognized and corrected, especially in depressed patients.

Sabrina Salupo (Athletic Training)

Dr. Morgan Bagley Athletic Training

Title: Os trigonum Fracture

Abstract: A case study was done on a track athlete who fractured his os trigonum. Os trigonum is an extra bone that develops on the posterior aspect of the ankle. The case study reports the history, clinical evaluation of the athletic trainer, the proper diagnosis, treatment plan and outcome of his injury. Due to the rarity of this injury, further research was completed to have a better understanding of this case. Findings concluded that os trigonum occurs in a small percentage of the population and usually is seen in adolescents. Os trigonum may be misdiagnosed as Achilles or peroneal tendonitis, tarsal tunnel syndrome or as a lateral ankle sprain. Os trigonum is atypical and fracturing it is unlikely. This case report is important since many clinicians don't see os trigonum problems, which makes a clinical diagnosis difficult. This project is to show clinicians that os trigonum may not be common in most individuals but it is still important to recognize and prevent further misdiagnosing of patients. It is important for clinicians to broaden their knowledge with this case study.

Monica Sincel (Psychology)

Dr. Kristine Turko Psychology

Other group members: Jessica Eicher (Psychology), Janelle McDonald (Psychology), Xya Taylor (Psychology), and McKenna Pierson (Early Childhood Education and Psychology)

Title: Perspective Taking on Ambiguous Language with Computer Mediated Communication

Abstract: Previous research has shown that people take a certain perspective (dispositional, situational, relational, or no-perspective/neutral perspective) while communicating via computer mediated communication (CMC) devices (Edwards, et al., 2016; Gasiorek, 2015). These studies have also shown that perspective taking correlates with high satisfaction in resolving ambiguity that could be experienced while communicating via CMC. This study investigated what perspective taking strategy (if any) people took while experiencing ambiguity while communicating with CMC devices. It also studied the level of satisfaction and the frequency of miscommunication each participant has been exposed to and how it pertains to each perspective taking strategy. When put in scenarios with ambiguous context, students from the University of Mount Union took an online survey that measured the frequency of a certain perspective they identified with the most. The survey also asked about their level of satisfaction while communicating via CMC, and what they believe to be the frequency of times they experience miscommunication on a regular basis. The results of this study are being calculated with two one-way ANOVAs. This study primarily hypothesized that if any participant identifies with a certain perspective

taking method while communicating via CMC, that they will also respond with having high satisfaction while communication via CMC and will have a lower frequency in how much they experience miscommunication with others via CMC. Past studies have shown that dispositional perspective-taking was negatively correlated with the frequency of experiencing miscommunication and positively correlated with communication satisfaction (Edwards, et al., 2016), this study then predicts that this research will display similar results. It is also hypothesized that people who identify with situational perspective taking will also have a high satisfaction when communicating via CMC, however, they will not be affected by the frequency of miscommunication they experience. We hope to understand what different characteristics make up the different perspectives and the impact on a person's ability to interpret ambiguous language. If the results support all three hypotheses, then this study will support previous research on perspective taking methods as a solution when experiencing ambiguity while communicating via CMC. Limitations of this study are sample size, limited demographic sample size, among other things. Edwards, R., Bybee, B.T., Frost, J.K., Harvey, A.J., & Navarro, M. (2016). That's not what I meant: how misunderstanding is related to channel and perspective-taking. *Journal of Language and Social Psychology*, 35(3). doi: 10.1177/0261927X16662968 Gasiorek, J. (2015). Perspective-taking, inferred motive, and perceived accommodation in nonaccommodative conversations. *Journal of Language and Social Psychology*, 34(5), 577-586. doi: 10.1177/0261927X15584681

Jon Stingel (Mechanical Engineering)

Dr. Chad Korach Engineering

Title: Environmental Degradation of Carbon Fiber Reinforced Composite Strength

Abstract: The increasing use and demand for technology in the world leads to advanced materials that can be the defining characteristic of a new type of sensor or design of a vehicle. Composite materials have long been used and modified in engineering applications due to their high level of strength while maintaining a low weight. As composites are used in harsh conditions and outdoor environments, exposure to Ultraviolet-radiation (UV) or moisture can degrade the composite material, causing it to lose its high strength to weight ratio. In this study, carbon fiber reinforced polymer composite samples are exposed to accelerated conditioning to both UV-radiation and moisture to determine the rate of decrease in strength with respect to time. Vacuum-infusion is a manufacturing method that is extremely cheap, and can produce composite materials comparable in strength to more expensive methods of manufacturing. Here, carbon fiber composites are created using a vacuum-bag infusion layup process, and their resulting strength is measured before and after the environmental conditioning. The relationship between decreased strength and time is important for analysis of civil infrastructure applications and marine systems which often utilize composite materials in harsh environments.

Joshua Thorne

Dr. Laura Kumler Political Science

Title: The Emergence of Environmental Justice: Space, Race, and Health in the U.S. and Northeast Ohio

Abstract: Imagine an elementary school located 400 yards from a hazardous waste facility. This was a reality for residents of East Liverpool, Ohio prior to 2005. These types of environmental injustices led to the creation of the Environmental Justice movement in the 1960's. In my paper I examine the little known field of Environmental Justice. The paper examines historical emergence and development of the field of environmental justice, both generally and specifically in Northeast Ohio. Green space, race, proximity to pollutants, gentrification, and public health are some of the main foci of environmental justice. While discovering the history of this social movement, I found that the most vulnerable neighborhoods in this country often become the dumping ground for environmental pollutants. Over time, exposure to heavy pollutants can cause both psychological and physiological problems for people living in heavily polluted areas. The federal government attempted to respond to some of these injustices with an Executive Order required consideration of environmental health burdens. Government policy and non-profit activism has continued to be a solution to support communities facing environmental justice.

Steven Tracy (Exercise Science)

Dr. Katherine Clark Exercise Science

Other group member: Angel Myers (Exercise Science)

Title: Music's Influence on Power Output in Maximal Bench Press, Squat, and Wingate

Abstract: This study researched the possible difference in anaerobic power when music is present compared to when there is an absence of music when performing 3 maximal velocity repetitions bench press at 50% of the subjects 1-repetition max, 3 maximal velocity repetitions of back squat at 50% of the subject's 1 repetition max and a 30-second Wingate test. If music can increase the power output throughout the workout, then an individual will see more results which will lead to increase performance in their sport or in everyday living. This is significant for anyone looking for a feasible and easily attainable ergogenic aid to enhance their power throughout a workout.

Brian Walker (Mechanical Engineering)

Dr. Joshua Gargac Engineering

Title: Bone Core Generator

Abstract: Osteoporosis afflicts around 54 million Americans and causes up to two million fractures annually, resulting in \$19 billion of costs. Therefore, the overall goal of this research is to improve our ability to accurately assess the fracture risk of an individual. Such an evaluation may aid in preventative

measures. Bone porosity is the percentage of bone that is not occupied by bone tissue, in effect it is a small hole in the bone tissue. In cortical bone these holes can lead to mechanical stress concentrations, increasing the likelihood of fragility fracture. In general, the more porous a bone becomes, the higher the stress concentration. Current forms of evaluation can be improved upon greatly, one way of doing this is through computer modeling, such as MATLAB, a programming language often used in engineering. By creating a models, the individual effects of pore geometry can be tested effectively. Without computer aid this would require finding bone core samples of with all possible pore geometries. In the long term, if it is proven effective in 2D the program could be modified to create 3D models. The program then might be helpful in compiling a list of pore qualities and their effect on bone strength, and probability models for bone fracture.

POSTER SESSIONS

AM Session Held in Giese Performance Center

Courtney Berish

Brittany DiFiore, et al

Alexandra Glacino, et al

Sabrina Ialupo

Uril Iberra-Moreno, et al

Kaylee Krichbaum

Lauren Liegl

Samantha Meluch

Andrew Paleno

Steven Tracy

Brian Walker

PM Session Held in Bracy Hall

Musical Performance by Dr. Robert Ekey's Science, Sound and Music class will occur near the end of the afternoon poster session.

Erica DeAngelo

Andrew Decker

Ryan Delbene

Ian Dilyard

Peyton Kranz

Megan Kurz

Jacob Mamula, et al

Emily McConnell

Jon Stingel

Joshua Thorne