

**Journal of  
Scholarly Endeavor**  
Volume XX

2020

Symposium for Student Research,  
Scholarship, and Creative Activity

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## MESSAGE FROM THE INTERIM PROVOST



Greetings,

Spend some time on our campus and you'll soon realize that "Experience the Difference" is more than just a tagline. The fundamental educational mission of Slippery Rock University is to transform the intellectual, social, physical, and leadership capacities of students in order to prepare them for life and career success. A complementary mission is to engage in scholarly activity. Around the year 2000, and under a different name, the framework of the Symposium for Student Research, Scholarship, and Creative Activity was developed. The Symposium was to provide a local forum where our students could share research experiences with peers and fellow collaborators in a supportive, non-competitive, learning and sharing environment. Individual achievements too could be celebrated.

The expectation of faculty involvement in collaborative research with undergraduates is not new to our institution nor that of many others. Although the classical definition of undergraduate research best fits historical trends in the natural sciences and social sciences, it was our Institutional intent to create a model that would work well with all disciplines. In truth, our vision has evolved through time and has benefitted because of the support and input of many, including students, faculty, staff, and administrators.

That the benefits of undergraduate research extend beyond discovery and dissemination is incontestable. Enhanced writing skills, communication skills, problem solving skills, and practical skills represent some of the benefits identified by students in regards to their respective undergraduate research experience.

The Journal of Scholarly Endeavor includes abstracts from each presentation accepted for the Symposium. Congratulations to all who have contributed and thank you all for what you have done and continue to do to provide our students with this high impact experience.

A handwritten signature in black ink, appearing to read "Jerry G. Chmielewski". The signature is fluid and cursive, with several loops and a long horizontal stroke at the end.

Jerry G. Chmielewski, Ph.D.  
Interim Provost and Vice President for Academic Affairs – Chief Academic Officer

INDEPENDENT RESEARCH,  
SCHOLARSHIP, AND  
CREATIVE ACTIVITY

# ART

## **Soar: An Interdisciplinary Performance Project**

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### **Poster Presentation**

#### **ABSTRACT:**

Soar, a multi-disciplinary collaboration that infuses the concepts of sailcloth history, art, astronomy, biology, dance and sustainability has produced a performance consisting of wearable sailcloth art for the MACAA (Mid- America College Art Association) bi-annual conference held at the University of Nebraska-Lincoln, Oct 3-5, 2018. Investigating the connections of macro- and micro-movement of wind, space, butterflies (wing patterns, movement and migration), and human movement informed the development for a sailcloth art installation with interactive dance. The goal of this project was to collaborate through art creation, dance choreography, and biology to seek out the relationships of movement and pattern in space, butterflies, and humans.

Visual imagery has been further developed through design, color theory, and paint application with recycled sailcloth. American Cruising Sails, Erie, PA assisted with costume design and sail sewing. Butterfly and moth wings were researched not only for color pattern and visual imagery, but also for movement, contractibility and function. The students had the ability to interpret the information that they learned from meetings held with other faculty members into their butterfly and moth wing designs.

Soar has been performed nationally at MACAA, Lincoln, NE; regionally at SRU Faculty Dance Concert, Succop Theatre, Butler, PA; and locally at Kaleidoscope Arts Festival, SRU Planetarium.

## **Art in Flight**

Victoria Grabosky, Jacob Smith, Christine Murcko

Faculty Sponsors: Barbara Westman, Dr. Shawn Davis, Pierre Bowins

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### **Exhibit**

#### **ABSTRACT:**

The project is a collaboration between the Art Department, the Department of Parks, Conservation and Recreational Therapy and the Macoskey Center to create a location specific field guide of the local bird populations in Western PA. This printed publication is based on the work of three students under the supervision of their professors. Each student was assigned a role: 1. research, 2. illustration, 3. publication design, provided an opportunity to develop the students' skills and knowledge in each area. Jacob Smith, a Master of Science in Park and Resource Management as well as a Master of Education in Environmental Education, worked with Professor Shawn Davis on the research for this book and wrote the copy text. From the Art Department, Victoria Grabosky worked with Professor Barbara Westman to create prints of 19 different birds to be used for identification, and Christine Murcko worked with Professor Pierre Bowins to create the book layout.

The publication will become a teaching tool in classes and a guide for SRU students and visiting community members. This guide will serve to further enhance the experience for community members and students who participate in birding programs at the Macoskey Center. The guide contains information regarding the conservation concerns of each species and local conservation efforts, encouraging conservation minded acts to preserve and protect our native bird species.

# BIOLOGY

## **Modeling Herd Immunity from Vaccination in an Epidemiology Educational Laboratory Activity**

Cortney Dean, Aspen Flynn

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### **Poster Presentation**

#### **ABSTRACT:**

When a large portion of the population is vaccinated, this can result in protection of unvaccinated individuals from infection. This protection is called herd immunity. Herd immunity is important for protection against many viral pathogens such as measles, mumps, and influenza. Currently, we have a laboratory activity that models the spread of a viral disease through an unprotected population using water, sodium hydroxide and a pH indicator. This laboratory activity is used in many non-majors classes to demonstrate basic principles of epidemiology. To further enhance this laboratory activity, we are working to establish a laboratory protocol that demonstrates how vaccination of a portion of the population results in protection against the spread of the disease by using a buffer in the laboratory activity.

## Evaluation of Activation of HSF and UPR Protein Folding Pathways by Chemical Stressors Using a Yeast Reporter System

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### Poster Presentation

#### ABSTRACT:

Accumulation of misfolded proteins in the cell is detrimental and can lead to cellular death. Therefore, there are conserved transcriptional response pathways that detect misfolded proteins and activate a cell response to mitigate the damage from unfolded proteins. The transcription factor that is triggered in response to the accumulation of the misfolded proteins in the cytoplasm is the heat shock factor (HSF). The unfolded protein response (UPR) is a pathway that is activated in response to the accumulation of the misfolded protein in the endoplasmic reticulum. HSF and the UPR help the cell to survive by providing a transcriptional response which aids the cell sequester and destroy the misfolded proteins. *Saccharomyces cerevisiae* were challenged with 4 different chemical stressors at 1 and 10mM dosages (Dithiothreitol (DTT), Diamide, Beta-mercaptoethanol, and hydrogen peroxide). The response to these chemical stressors were then tested using the beta-galactosidase assay to establish if the chemical stress triggered a transcriptional response of the HSF and UPR pathways. These assays will help determine: 1) If these chemical stressors activate the HSF (cytoplasmic response) or the UPR (ER response) pathway or both the pathways. 2) If the activation of the transcriptional response is dependent on the dose of these chemical compound (whether they function differently at high and low dosages).

## **Effects of Chronic Imidacloprid Exposure in *Xenopus laevis* on Blood Glucose Levels**

Rosemary G. Myers, Leah V. Marshall, Kelsey L. Gustafson, Grascen I. Shidemantle, Zoey I. Campbell, Miranda J. S. Falso, Paul G. Falso

Faculty Sponsor: Dr. Paul Falso

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### **Poster Presentation**

#### **ABSTRACT:**

Amphibian populations have been on a global decline, with levels dropping significantly in the last two decades. This massive loss of individuals can likely be accredited to multiple environmental changes, such as habitat loss, climate change, and pollution. The neonicotinoid family of insecticides is the fastest growing group of insecticidal pesticides by usage in the world. The neonicotinoid used in this study was imidacloprid because it became the world's most popular insecticide in 2008 and continues to be a widely used chemical today. Previously, groups of adult male African clawed frogs (*Xenopus laevis*) were exposed by immersion for 48 days to environmentally relevant concentrations of imidacloprid in water, ranging from 0 to 300 parts per billion (ppb). We collected blood samples from these groups of male *X. laevis* and will measure plasma glucose levels. The focus of this ongoing research project is to determine if there are differences in the control of blood glucose in amphibians that are exposed to imidacloprid at concentrations found in the environment. Our results may give insight into the effects of imidacloprid exposure on the global amphibian population decline.

## **An Investigation of the Impact of Acid Mine Drainage on Microbial Breakdown of Leaf-Matter in Streams**

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Faculty Sponsor: Dr. Christopher Maltman, Dr. Dean DeNicola

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### **Poster Presentation**

#### **ABSTRACT:**

This study was conducted to examine the effects of acid mine drainage (AMD) on microbial communities in local streams. Microbial communities are known to tolerate harsh environments, including mine drainage, and play a vital role in colonizing leaf matter that has fallen into the water. When a leaf first enters a stream, it starts to decompose due to the colonization of bacteria. Many aquatic macroinvertebrates feed on these conditioned leaves as they are the main source of energy in many shaded streams. To examine the effects of AMD on bacterial colonies and leaf break down, three sites were investigated: an AMD site, a treated site, and a natural site. For each location, classic bacterial plating techniques were completed for both water and sediment samples. It was seen that the AMD site contained the least amount of growth. Metagenomic data was collected from each site for water, sediment, and leaf samples, and were used to view the composition of the microbial communities. Leaf packs were placed at each site to evaluate break down among sites and for two types of leaves. There was a significant difference in bacterial respiration rates,  $p = 0.000$ , between beech and maple leaves at all sites, and a significant difference,  $p = 0.000$ , was seen in the mass lost between maple and beech leaves. There was no difference among sites for respiration and mass loss. Leaf penetration force was also tested and showed a significant difference,  $p = 0.00$  between the two leaf types. Penetration also indicated the natural site had the softer leaves compared to the AMD site. Acid mine drainage appears to have an effect on microbial communities and the rate of leaf decay.

## Examination of HSF Activation in a *Saccharomyces cerevisiae* Model for TPI Deficiency

Hailey Schaffold, Kathryn Skolnick, Lily Jean Schlosser, Carol Barnes, Kortnee Koziara, Amber Lellock, Isaac Fisher, Stacy L. Hrizo

Faculty Sponsor: Dr. Stacy Hrizo

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### Poster Presentation

#### ABSTRACT:

The specific objective of this study was to determine if the expression of mutant Triose Phosphate Isomerase (TPI) proteins activated heat shock factor (HSF), a transcription factor that helps organisms survive exposures to acute temperatures and protein folding stress. The mutant TPI proteins being examined are E104D, F240L, I170V, V231M and C41Y (all common human mutations associated with TPI deficiency, a neurodegenerative disorder), and M80T, a point mutation in *Drosophila melanogaster* that causes progressive neurodegeneration in the fly model. The mutations studied all are associated with the disorder, TPI deficiency, a neurodegenerative disease that is caused by the misfolding and loss of function of the glycolytic enzyme. *Saccharomyces cerevisiae* expressing the mutant TPI alleles was examined for activation of HSF and were compared to yeast expressing a wild type (WT) TPI allele. The transcriptional response of HSF in the TPI deficiency yeast strains was measured using a  $\beta$ -galactosidase reporter assay.  $\beta$ -galactosidase activity levels are measured with the substrate ONPG and are normalized by protein concentration determined by a Bradford Assay. Higher  $\beta$ -galactosidase units indicated a higher levels of the HSF pathway activation. Determining if HSF is activated in TPI deficiency patients may lead to understanding of disease pathogenesis in TPI deficiency patients and provide potential pharmacological targets in future studies. We hypothesized that *S. cerevisiae* expressing the mutant TPI alleles that result in chronic expression of a misfolded protein will exhibit a higher level of HSF activation compared to the wild type *S. cerevisiae*.

## Evaluating the Dose Dependent Response to DTT Treatment Resulting in HSF Activation in *Drosophila* Cells

Austin Shirk, Annette Choi, Kaitlyn Joyce, Stacy Hrizo, Martin Buckley

Faculty Sponsors: Dr. Martin Buckley, Dr. Stacy Hrizo

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### Poster Presentation

#### ABSTRACT:

Proteins drive many of the biological processes in cells. To do this, they fold into complex 3D structures that are integral for their functionality. Notably, various environmental and chemical stressors can disrupt protein folding and thus disable the functions of proteins, threatening the livelihood of cells. To mitigate this stress, organisms initiate the highly-conserved heat shock stress response. In eukaryotes, the master heat shock activator heat shock factor (HSF) is rapidly recruited to the *Hsp70* heat shock protein genes and triggers the recruitment of additional co-activator proteins that facilitate gene expression. This leads to the production of heat shock proteins that function as molecular chaperones to promote refolding of proteins, prevent aggregation and increase protein degradation pathways. Notably, activation of the heat shock response pathway, can be microscopically visualized by measuring GFP-tagged HSF binding to the heat shock protein genes in living *Drosophila* salivary gland nuclei. Our lab has used this technique to identify novel compounds that induce the heat shock response pathway. Surprisingly, high levels of Dithiothreitol (DTT, 100 mM), a chemical known to cause protein misfolding and activation of the unfolded protein response pathway (UPR), results in the recruitment of GFP-HSF to the *Hsp70* gene loci. Additional experiments with lower DTT concentrations led to the hypothesis that DTT induces a dose dependent activation of HSF. In order to strengthen this hypothesis, qRT-PCR will measure *Hsp70* RNA expression levels with various DTT concentrations. Results could lead to additional experiments that mechanistically dissect how DTT activates the heat shock pathway.

# CHEMISTRY

## Electrochemical Evaluation of Iron Chelators as Chaperone Models for Iron Uptake by Ferritin

Antonio Blundo

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### Poster Presentation

#### ABSTRACT:

Cellular ferritin catalyzes the oxidation of ferrous iron via its ferroxidase center, and then incorporates Fe (III) into its mineral core. Ferrous iron ( $\text{Fe}^{2+}$ ) is the most likely iron species transported to ferritin, probably via chaperone proteins, given the reductive environment of the cytoplasm. As such, an iron chaperone is expected to stabilize iron as  $\text{Fe}^{2+}$  at potentials where ferritin is in its oxidized form. EDTA, tricine, histidine, arginine and lysine were chosen because each compound forms an iron (II) complex. Separate iron-chelate solutions of each compound were made using non-iron binding MOPS-saline buffer to avoid interference with the iron-chelate formation. A pH of 7.0 was maintained to mimic physiological conditions. The electrochemical properties of the iron complexes were examined using voltammetry. Each voltammogram was scanned starting in the positive direction since the iron in solution was already in its reduced form, and the general potential range used in each experiment was -0.6 V to 0.6 V. Ferritin's oxidation begins at -0.1 V, thus, the iron-chelate complexes whose current-potential scans finish reducing at a potential more positive of -0.1 V stabilize  $\text{Fe}^{2+}$ , while those that finish reducing more negative than -0.1 V stabilize  $\text{Fe}^{3+}$ . In the presence of EDTA, Fe (III) finished reducing at a potential of -0.25 V, and was therefore eliminated as a chaperone model. Amino acids showed the most promise as chaperone models due to their ability to bind to Fe (II) while preventing hydrolysis. Histidine, and tricine were found to be the best chaperone models since they stabilized Fe (II), while lysine and arginine stabilized Fe (III).

## **Use of Fluorescence Microscopy for Analyzing Changes in The Expression of Mitoneet After Treatment**

Maci Coleman, Jenell Gerow, Rachel Hemmerlin, Kayle Marsh, Ashley Loe

Faculty Sponsor: Dr. Ashley Loe

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### **Poster Presentation**

#### **ABSTRACT:**

Alzheimer's disease (AD) is a common neurodegenerative disease that affects learning and behavior. Formation of senile plaques of the amyloid beta ( $A\beta$ ) peptide and neurofibrillary tangles characterize AD in various parts of the brain, leading to the change in memory, planning, thinking, behavior and language, although the overall cause is still unknown. There have been few treatments for AD, including donepezil, galantamine, and rivastigmine but they have only been able to help alleviate the symptoms of AD. It has been hypothesized that the dysfunction of mitochondria, or the powerhouse of the cell, is linked to neurodegenerative diseases. When the mitochondria produces energy in the form of adenosine triphosphate (ATP), the mitochondria also releases reactive oxidative species (ROS) which leads to damage and changes in expression in tissues, proteins, and genes.

Our studies will investigate the effect of current AD treatments on the expression of mitoNEET and other mitochondrial proteins. Changes in expression are monitored using fluorescence microscopy. The overarching goal of this research is help resolve the cause of AD by evaluating changes in protein expression when exposed to a high oxygen environment,  $A\beta$  and current drugs used to treat AD.

## **Evaluating Changes in the Expression of Nicotinic Acetylcholine Receptors and MitoNEET Upon Treatment**

Jenell Gerow

Faculty Sponsor: Dr. Ashley Loe

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### **Oral Presentation**

#### **ABSTRACT:**

Alzheimer's disease (AD) is one of the most common neurodegenerative diseases, affecting over 5 million Americans. Symptoms generally develop slowly and worsen over time, becoming severe enough to hinder with everyday tasks. This disease is commonly characterized by the formation of senile plaques of the amyloid beta ( $A\beta$ ) peptide and neurofibrillary tangles commonly developed in the hippocampus, prefrontal cortex, cerebellum, and the temporal lobe, thus endangering the patient's memory, thinking, language, planning, and behavior. There have been various hypotheses regarding the development of AD, but there is still no known origin or cure. Treatment has been limited to alleviating the symptoms for those affected by AD with medications. One of the new focuses for the treatment of AD is concentrated on mitochondrial dysfunction. This phenomenon occurs when the mitochondria, the powerhouse of the cell, releases reactive oxidative species (ROS) that cause changes in expression and damage to tissues, proteins, and genes. The overarching goal of this research project is to help clarify the mechanism of AD and identify potential targets for a cure by evaluating changes in protein expression as a result of exposure to a high oxygen environment,  $A\beta$ , and current therapeutics. Our preliminary studies use fluorescence microscopy to verify that the  $\alpha 7$  subtype of nicotinic acetylcholine receptor (nAChR) is upregulated upon exposure to donepezil, a current treatment for AD. Further studies will investigate the effect of donepezil and other treatments on the expression of mitoNEET and other mitochondrial proteins.

## The Synthesis of 5'-Nor-Isoneplanocin Analogues as Antiviral Agents

Kathryn Jones

Faculty Sponsor: Dr. Qi Chen

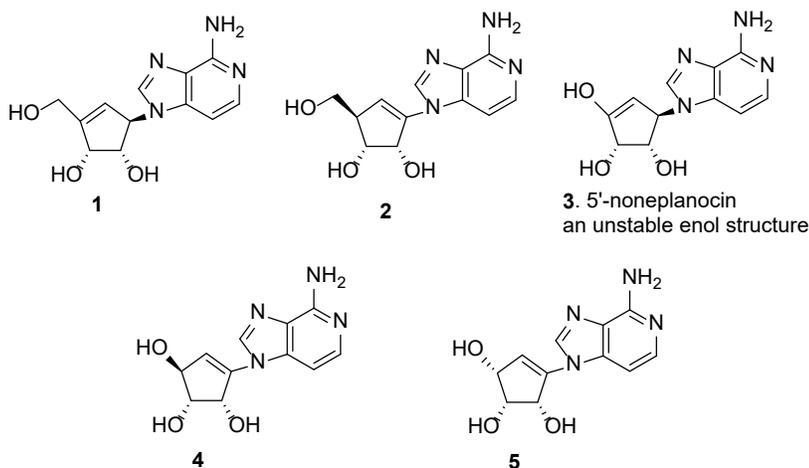
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### Oral Presentation

#### ABSTRACT:

Emerging (2019-nCoV or 2003 SARS) and reemerging (2015-16 Ebola; influenza) viral outbreaks have posed great threat on our public health. Nucleosides and nucleotides are building blocks of the genetic material for viruses and their chemical structure analogues are important resources in search for antiviral agents, such as Remdesivir for ongoing 2019-nCoV epidemic.

3-Deazaneplanocin (**1**) and 3-deazaisoneplanocin (**2**) have been recognized with board spectrum antiviral activity including against the Ebola virus. The 5'-truncated structure is a useful strategy for nucleoside analogues to assess the mechanism for their antiviral activity. However, the truncated 5'-nor derivative (**3**) of the parent neplanocin (**1**) is unable to obtain due to the unstable enol structure. It makes the designed structures 5'-nor-isononeplanocin analogues (**4**, **5**) not only interesting derivatives for **2**, but also an alternative surrogate for **3**. A novel synthetic route was developed for 5'-nor-isononeplanocin analogues (**4** and **5**) with a propylidene rearrangement as the key step. The target **4** and its 4'-epimer **5** were accomplished and their L-enantiomers are forthcoming.



## Investigating Solution Properties of Manganese 12-Metallacrown-4

Jacob Palmer, Thaddeus T. Boron III

Faculty Sponsor: Dr. Thaddeus Boron

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### Oral Presentation

#### ABSTRACT:

Magnetism is a phenomenon that arises from the movement of negatively charged particles called electrons. A magnet can take one of two orientations and requires energy to switch between these orientations. The orientations can be thought of as an “on” and “off” switch. When a molecule behaves this way, it is a single-molecule magnet. Single-molecule magnets (SMMs) could potentially be employed in the next generation of data storage devices or in quantum computers.

One family of compounds that behave as SMMs are a family of metal-containing compounds called metallacrowns (MCs). These molecules contain metal ions organized in a predictable and reproducible manner. Our work utilizes **Mn(OAc)<sub>2</sub>[12-MC<sub>Mn(III)N<sub>(shi)</sub>-4]</sub>**, a planar, 12-membered ring with four Mn(III) ions oriented in a ring and a Mn(II) ion in the central cavity. **Mn[12-MC-4]** exhibits single-molecule magnetic behavior, making it an ideal choice for our study.

While SMMs show promise in computing, they cannot be utilized until their exact location in a storage device can be determined. Researchers will need to know the exact locations of SMMs in order to successfully and efficiently recall stored data. Recent research has attempted to deposit SMMs onto molecularly flat surfaces, such as graphene. Here, we present our efforts towards depositing **Mn[12-MC-4]** onto graphene, representing an important step towards preparing the next generation of functional magnetic devices.

## **Structural Impacts of Substituting Dialkylated Amino Acids into a Beta-Sheet Peptide**

Anna Will, Shannon Rose

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### **Poster Presentation**

#### **ABSTRACT:**

Peptides are short amino acid sequences that mimic the behaviors of larger proteins, allowing them to be used to study protein function. Peptide therapeutics can potentially be used as a treatment for several deadly diseases such as Alzheimer's, HIV, diabetes, and cancer by decreasing the amount of protein denaturation and aggregation that naturally occurs within the body. Peptide therapeutics can be digested by enzymes in the body and cleared easily, making them an attractive candidate for drug research. Previous research has shown that peptides will support the incorporation of amino acids in which the proton has been replaced with an alkyl side-chain.  $\alpha,\alpha$ -Dialkylated amino acids with varying side-chain lengths were incorporated into the model system using microwave-assisted solid-phase peptide synthesis. One experiment used, a model system of 7 amino acids that naturally forms a  $\beta$ -sheet structure. The structural effects of incorporating aminoisobutyric acid, methylethylglycine, and diethylglycine were examined. Homonuclear multidimensional NMR was used to determine the stability of the peptides' folded structure. Another experiment used a model system with 17 amino acids, substituting the A9 amino acid with various alkyl side chains to determine folding patterns. HPLC procedures were used for purification of the peptide and LC-MS procedures were used for identification of the peptide.

# COMPUTER SCIENCE

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## **Understanding the Content of Spam Email: A Topic Modeling Approach**

Jorge Kenzo Balerdi

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### **Poster Presentation**

#### **ABSTRACT:**

Spam emails currently represent over 54% of all email traffic on the internet, and due to its unwanted nature, it is important to detect and block them before they reach end users. To this end, machine learning and text mining approaches provide promising tools to work with user generated content. In this study, we propose the use of Topic Modeling techniques to understand the content of spam emails as a first step for the detection and prevention of such email. Topic modeling is a statistical model that can be applied to text data in order to identify topics and themes that are present in the text. With over 2.5 quintillion bytes of data being produced every day, tools like topic modeling are crucial to help us analyze, understand and organize this data in a convenient manner. Our data set consists of spam email dumps collected over a number of years. The spam email dumps require pre-processing in order to extract the body of email messages. This requires the removal of non-relevant metadata and html elements. Preprocessing was done using a simple program, written in C++, that identified the messages, separated the email body from other non-relevant content, and exported them into a tabular format for further processing. Next, we are planning to use the Latent Dirichlet Allocation (LDA) model to extract the topics from the spam email collection, and then identify the main theme for each topic based on the representative keywords of each topic. By scaling this process, we might be able to identify the main topics and themes in spam email that could be used as a the first step in the detection and prevention of spam emails more accurately, since some spam and phishing emails are still able to bypass current filters.

## **Employing Augmented Reality for Cybersecurity Operations in High Performance Computing Environments**

Cory Haser

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### **Poster Presentation**

#### **ABSTRACT:**

With the advent of myriad different technologies in the modern computing era, the future of high performance computing (HPC) data centers comprising heterogeneous compute servers and networks involves a significantly greater degree of cyber-threats than we are observing currently. As a result, conducting cybersecurity operations at the HPC data centers encompasses a highly cognitive workload environment, where information is rapidly generated, is exceedingly dynamic and is vastly unpredictable. An important challenge faced by cybersecurity specialists is managing the extreme levels of stress and utilizing emerging technologies for monitoring, assessing and defending multiple cyber-attacks in real-time. In this study, we present an augmented reality based framework for storing, analyzing, visualizing and augmenting data at the HPC centers. This framework is proposed with the goal of improving the data presentation, forecasting, analysis and decision making, thus reducing the time to insight and learning the HPC security operations to combat increasing cyber physical threats.

## **Geo-Grid: Interactive Visualization of Geological Datasets**

Jordan Walters, Sonny Sevin

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### **Poster Presentation**

#### **ABSTRACT:**

As the emergent technology trends are progressing towards extreme-scale HPC coupled with data intensive analytics, the challenge of storing and analyzing data is significantly greater than we are observing currently. Given the vast volume of data generated by various simulation and experiments, the process of successfully analyzing and validating diverse sets of research phenomena mandates execution of various complex queries, the correlation of the disparate data retrieved followed by generating visualizations facilitating meaningful insights of both the simulated processes and the experimental phenomena. This process of data discovery, analysis, and visualization requires execution of several phases by the researchers. Therefore, managing and generating data visualizations is a major bottleneck in the research discovery process that degrades not only the ability to mine the data but also limits the utilization of scientific data sets. An important challenge in exploring geospatial data is visualizing different scales ranging from micrometers to kilometers. The purpose of this study is to develop and implement a framework for storing, analyzing and visualizing geological datasets at different scales, with the goal of improving the scientific discovery process and reducing the time to insight in the geological domain along with hiding the intricacies of the underlying low-level complex hardware platforms from the end-user.

# CRIMINOLOGY AND

# CRIMINAL JUSTICE

## **School to Prison Pipeline**

Victoria Combs

Faculty Sponsor: Dr. Sarah Kuehn

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### **Oral Presentation**

#### **ABSTRACT:**

This presentation discusses how school discipline adversely affects minority students, which can be the starting point for their involvement in the criminal justice system. This so-called “school to prison pipeline” can have severe consequences for their later trajectory in life. This presentation will examine the problems of differential treatment of minorities in schools and the use of police resource officers. It will also discuss the types and effectiveness of policies and programs that are being implemented to counter this trend.

## **Results from an Exit Survey of Drug Treatment Court Participants**

Janel Jones. Chelsea Smith

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### **Oral Presentation**

#### **ABSTRACT:**

Drug Treatment Courts (DTC) are problem solving courts that aim to end the cycle of substance abuse/addiction and recidivism that is occurring in their communities. Research has shown that these courts are effective. However, there is limited research that focuses on participants' experience in the program. This study examines the results from an exit survey that participants from a DTC in Western PA completed. Policy recommendations and suggestions for improvement for the court are discussed.

## **Rape Myths in the Media: How Does the Public Perceive Sexual Assault?**

Pauline Matthew

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### **Poster Presentation**

#### **ABSTRACT:**

Previous research indicates the prevalence of rape myths in the media which highlights how people see what constitutes rape. This research project analyzes the perception of rape myths in the comments section of online newspaper articles written about sexual assault and rape. Online newspaper articles are utilized based on keywords in the title such as, "sexual assault," rape," and "sexual harassment." The online newspaper articles are chosen from major cities within the United States and date back 15 years from the present. A select number of comments will be chosen from each article for rape myth analysis. The comments chosen will be analyzed for the type and frequency of rape myths.

# DANCE

## **Finding a New Dialect Within Dance**

Olivia Barner

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### **Performance**

#### **ABSTRACT:**

This creative project investigated the process behind choreography and dance training, and what is required to produce choreography based on specific research. From January 5th-January 11th, 2020, I traveled to Nashville, Tennessee to complete a Creative Research Dance Intensive with the contemporary dance company, New Dialect, under the artistic direction of Banning Bouldin, who led the research process. In this dance intensive, we focused on methods to create movement in nonconventional ways, such as creating a sensory environment, an imaginary setting, and a character. These movement studies were generated with writing prompts that allowed me to explore different departure points and motivations for creating movement. Throughout the spring 2020 semester I have integrated these creative techniques in a solo that I have performed in both classroom and stage venues.

## **Circus Apparatus**

Kathryn Hines

Faculty Sponsor: Nora Ambrosio

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### **Performance**

#### **ABSTRACT:**

Acquiring a Student Research, Scholarship & Creative Activity Grant has allowed me to purchase and sharpen my skills on the lyra (aerial hoop), apply my research on combining circus arts and dance, and incorporate this circus apparatus in my choreography for my own independent concert and the research symposium. I will utilize choreographic tools that I have learned from the Dance Department, as well as my training from working at a circus camp. This project is challenging me to work with a circus apparatus and create a piece that combines formal dance elements with circus arts. I will be teaching myself new movements, as well as, utilizing movements that I know from other circus apparatus. Creating this solo has required hours of rehearsal, as well as engaging in strength training to build my stamina.

## **Creating Community Through Dance Film**

Luvenia Kalia, Francine Maitland, Kayla Jesberger, Sydni Brooks, Noelle Potts

Faculty Sponsor: Jennifer Keller

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### **Performance**

#### **ABSTRACT:**

Dance film unifies story, choreography, and cinematography into a compelling narrative. This creative research project brought together a director/choreographer and cinematographer, along with student, faculty and alumni performers, to create a short, experimental dance film about friendship and community. In September 2018, award-winning filmmaker Marta Renzi came to Slippery Rock University and cast 16 performers in a dance film that was shot in four nearby locations. Student researchers participated in a creative process in the dance studio and on site, adapting choreography to specific locations. The final version of the film premiered at Slippery Rock University in the 2018 Department of Dance Fall Concert, and has gone on to be screened across the world at juried, independent film festivals in Cuba, Greece, Mexico, Poland, Sweden, and the U.S.

## **Exploring the Employment Realities of Professional Ballet as a Collegiate Dancer**

Ashleigh Schuler

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### **Poster Presentation**

#### **ABSTRACT:**

Regarding my findings at Cincinnati Ballet's Collegiate Intensive, I argue that ballet dancers over eighteen years old face a more difficult, yet possible, path to employment in a professional ballet company. This is seen in the quantitative data found regarding three companies of ranging size: Rochester City Ballet, Cincinnati Ballet, and the Joffrey Ballet.

By quantifying data into exact numbers, I comparatively studied the percentage of dancers who attended college out of the entire number of members the company employs. Hypothesizing a correlation between smaller company size to more college graduates, I accepted this hypothesis as factual. Company size was evaluated in two ways: the number of company dancers and the company's annual budget, measurement techniques introduced at the Collegiate Intensive. After analyzing these statistics, I synthesized the results in coordination with the supporting field experience gained during the program.

To quantify this data, I named variables for each of the following: Number of Dancers Employed (X), Number of Dancers Employed that Attended College (Y), Percentage of Collegiate Dancers Employed/Total Dancers Employed ( $(Y/X) = W$ ), and Annual Company Budget (Z). This data was graphed to visually demonstrate the correlation present between variables.

After completing this study based on the protocol above, a correlation supported that a larger company budget and larger number of dancers resulted in a lower percentage of the company consisting of collegiate dancers. Conversely, it became clear that smaller companies are more populated with collegiate dancers. My experience at the Cincinnati Ballet Collegiate Intensive was supported by these findings with ballet field interviews, lectures, and professional mentoring that the intensive provided. Additionally, this research was published in an online web resource I created to disseminate this information into the dance field.

ELEMENTARY/EARLY  
CHILDHOOD EDUCATION

## **Building Undergraduate Student/Professor Relationships Through Early-Semester Office Visits**

Katlyn Allison, Allison Bensley

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### **Oral Presentation**

#### **ABSTRACT:**

Studies have indicated that student-faculty face-to-face interactions within the college experience are positively associated with both undergraduate student satisfaction and retention (Campbell & Campbell, 1997; Lau, 2003). Although office hours present an opportunity for these interactions to occur, they are not widely utilized in this way. In our action research study, undergraduate students in an early childhood education literacy methods course were encouraged to attend their professor's office hours during the first 2-3 weeks of the semester. It was hoped that these brief meetings would have a positive impact on student engagement, satisfaction, and learning. Following the opportunity to attend early-semester office hours, the students were asked to complete an electronic survey that was used for analyzing how the visits affected student-faculty relationships from the students' perspective. Qualitative analysis using grounded theory (Corbin & Strauss, 1990) allowed several themes to emerge from the survey data. Our findings indicated that students (98%) found value in the early-semester office visits including 1) a personal and professional relationship with the professor, 2) a greater feeling of comfort and confidence in class, and 3) an opportunity to request additional support with course content.

In this session, we will share our methodology/process, findings, and the implications for the professor's future teaching including both positive aspects and plans for improvements to future iterations of the initiative.

#### References:

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## **The Differences Between Chinese & US Education Systems**

Laura de Caussin

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### **Oral Presentation**

#### **ABSTRACT:**

**Purpose:** The purpose of this research project was to compare and contrast Chinese and United States educational theories and theorists. The research addressed the questions: Are the educational theorists that undergird the Chinese system of education similar or different than Western educational theorists? If both China and the United States share common theorists, how have each ended up with such different education systems?

**Design/methodology:** Research was conducted through peer-reviewed journal articles and online sources. Most of the information that was gathered was from book chapters or literature reviews. Information-gathering followed an iterative process as follows: broadly gathering topical information, categorizing according to themes, comparing and contrasting information regarding each culture, narrowing the informational cited, and continuing the process until the research questions were thoroughly answered. The material was then summarized into concise descriptions on an infographic. The infographic was chosen to be a visual aid to an audience while an oral presentation was to be given.

**Findings:** Due to globalization, China's education programs are influenced by Western theorists that include Piaget, Vygotsky, Dewey, Bronfenbrenner and more. Although China has been influenced by Western educational ideas, there are misalignments between theory and practice. It is suggested that these differences are due to cultural influences and the inability to apply culturally inconsistent practices. The main cultural distinctions that were discovered fell under three categories: ethical, societal, and educational. These distinctions are seen in varying interpretations of educational theory inside the classroom. For example, an important concept of Western educational theory is having child-centered classroom. However, obedience to hierarchy is deeply rooted in Chinese culture, making the implementation of child-centered classroom, instead of teacher-centered classrooms, unnatural and borderline disrespectful. These cultural differences make it difficult for China to internalize and apply Western educational theory making a Chinese classroom different than a United States classroom.

## **Preservice Teachers' Use of Feedback and Praise**

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### **Poster Presentation**

#### **ABSTRACT:**

Adults' language has implications for how children conduct themselves in learning environments and how they approach learning tasks. Early childhood teachers aim to help children feel confident and competent, to know that they are valued and their contributions are appreciated. Thus, preparing teachers to use language intentionally is an important focus for teacher educators as they strive to prepare effective practitioners. Therefore, findings contribute to curricular and professional development decisions.

Data were collected via electronic survey distributed to all undergraduate early childhood education majors and dual early childhood and special education majors at SRU. Thirty-eight students completed the full survey. The survey contained six classroom scenarios and asked students to indicate how they would respond to the child in the scenario. Responses were analyzed using qualitative analysis software and a codebook based on previous research.

Preliminary findings indicate that while the majority of preservice teachers' responses can be filed under the same code (e.g.: effort: specific evaluative), the wording that makes up that response is extremely varied. Also, less experienced preservice teachers are more likely to give generic praise, as opposed to praise on a task followed by specific tailored feedback as seen in teachers closer to attaining a state certified teaching certificate. In addition to experience level, the responses vary depending on the candidates' stage in the program. For example: a student who has not yet taken a literacy methods course may not be as likely to support invented spelling or nonsense rhyming words in their response to a scenario featuring a child in the phonetic spelling stage.

Understanding candidates' natural inclinations as well as the effects of progression through a teacher education program can help teacher educators to prepare candidates more explicitly and effectively for this area of practice.

## **I See You: Stories of Black Faculty and Student Interactions in Teacher Education Programs**

Danaye Morris, Carly Rhome, Rachel Broskey

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### **Oral Presentation**

#### **ABSTRACT:**

Initiatives in higher education have called for colleges and universities to prioritize diversifying both student and faculty populations (Darden, Kamel, Jacobs, 1998). Many of these initiatives involve the use of discretionary funding and scholarships to attract black faculty and students to primarily white institutions. While institutions benefit from the presence of black faculty and students through meeting diversity goals, black faculty and students find that they struggle to thrive at PWIs most often due to racial battle fatigue, or the constant need to defend or qualify your presence or being asked endure the cumulative effects of racism (Smith, Allen, & Danley 2007; Feagin, Vera, & Imani 2014).

Unfortunately, these issues are not excluded from students in Pre-Service Teacher programs. Due to the current demographics of preservice teachers entering the profession and faculty in teaching positions at most PWIs, students of color stand out dramatically in these spaces. As our college of education seeks to recruit and retain black students and faculty to attend to the diversity goals of the institution, it is important to note the current state of affairs that exist in teacher preparation programs for these individuals (Bennett, Cole, and Thompson, 2000). Few studies explore the perceptions of pre-service candidates of color regarding the practices and support systems in university-based educator preparation programs (Szecsi and Spillman , 2012; Burrnett, 2016).

This study seeks to understand the experiences of black faculty and students at PWIs within teacher education programs across the state of Pennsylvania. The researchers go beyond the ideas of homophily, defined as a shared racial and cultural backgrounds between black faculty and students, to attempting to understand the mutually beneficial system of interactions at the college and university level that are used for support and spaces of refuge. In this sense, we are investigating retention strategies that will support both black faculty and students of color on campus.

In addition to understanding the lived experiences of black faculty and students at our colleges and universities, we also seek to compare and contrast programs and initiatives that seek to support retention efforts with the reality of these reported experiences. The findings will reveal faculty and students' major concerns as well as strategies colleges and universities can implement to address these major concerns.

## **Through the Eyes of Early Childhood Teachers: Global Citizenship in the Classroom**

Jacqueline Routhier

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### **Poster Presentation**

#### **ABSTRACT:**

For several decades, global education has been a focal point in the education discipline (Rapoport, 2010). Yet, very little research has been conducted on global education within preschools in the United States (Hancock, 2017; Twigg, Pendergast, & Twigg, 2015). Global education encompasses concepts, practices and beliefs about the world and community that are making the planet more equitable, fair and sustainable (Gallavan, 2008; Rapoport, 2010; Twigg, Pendergast, & Twigg, 2015). Currently, there is a need for global citizenship to help teach respect, equity and sustainability in addition to valuing diversity (Twigg, Pendergast, & Twigg, 2015). Therefore, there is a need to understand how global citizenship is taught in preschool through the voices of preschool teachers. The aim of this study was threefold: 1) To become informed of how preschool teachers, define global citizenship and if they feel they are teaching global citizenship to their students. 2) To explore how preschool teachers are teaching global citizenship. 3) To find ways to support teacher education programs to be more equipped to prepare future teachers to teach global citizenship. The purpose of this study was to understand the different views of teaching preschool students how to be global citizens. The study provides suggestions of ways schools can prepare and support teachers in fostering global citizenship. The study used a non-experimental survey research method (Johnson & Christensen, 2008). The study was considered a basic qualitative study and was interpretive in nature (Merriam, 2009). The data was collected through the survey in yes or no questions and an open-ended question section. The analysis of the raw data was conducted by identifying recurring themes and patterns using the NVivo software. The findings of the research are used to share the commonalities between teachers and how this can further teacher preparation programs.

# ENGLISH

## **Black Students' Oral History and Art at The Rock**

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### **Oral Presentation**

#### **ABSTRACT:**

In the fall of 2019, we received a grant from Slippery Rock University to record and publish Black students' oral stories and art about attending SRU in order to highlight minority students' particular experiences at a majority white institution. Oral storytelling in Black communities has a particular legacy because law forbade enslaved people literacy until only a few generations ago. Entire family and community histories existed only through oral performance and memory, producing not only factual accounts but also robust creative works in the form of folklore and songs that are as much about experiences of Black Americans as they are about the act of storytelling itself. Transcribing such stories into written documents challenges the recorders to navigate theoretical debates about representation of language in the AAVE dialect, so the research involved in our project is twofold: we are collecting narratives as university artifacts and weighing choices in the representation of those stories for the future SRU community. The stories will appear in transcription in SLAB, the English department's award-winning literary magazine, and New Student Orientation will incorporate the recorded videos with print materials to improve race education and our campus climate. I will present the challenges and rewards during the Spring 2020 semester in collecting and representing narratives of the current Black community at Slippery Rock.

EXERCISE AND  
REHABILITATIVE SCIENCES

## **Your IAD Did What Today? Screening for Consistency in the Resting Inter-Arm Difference in Systolic Blood Pressure**

Chase Dillon, Alyssa M. Hahn, Jon D. Keyser, Kyle M. Edgar

Faculty Sponsors: Dr. Michael Holmstrup, Dr. Benjamin D.H. Gordon, Dr. Brock T. Jensen

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### **Oral Presentation**

#### **ABSTRACT:**

A large inter-arm difference (IAD) in systolic blood pressure (BP) may preclude cardiovascular disease risk and early mortality. The consistency of single-incidence BP (i.e., a measure performed on one occasion) is equivocal. To date, there have been no investigations into the reproducibility of single-incidence measures of resting IAD.

**METHODOLOGY:** Young, healthy participants completed informed consent. Prior to all sessions, participants followed strict pre-test instructions (e.g., 4-hour fast, no caffeine). **SCREEN-** On three occasions, participants reported to the Exercise Science Research Laboratory for a baseline bilateral BP screening. At **SCREEN**, two bilateral BP measurements were conducted at five-minute intervals following a 15-minute rest. If more than 4mmHg apart, a third BP was taken. **TOTAL-** Further, an additional twelve resting bilateral BP measures were completed on six separate days. Each participant, therefore, was subject to 18-21 total bilateral BP measures over nine sessions. All bilateral BP measures were simultaneous (gold standard). Participants were classified as either **IAD+** (>10mmHg difference between arms) or **IAD-** (<10mmHg between arms) based on **SCREEN** and **TOTAL** systolic IAD averages. Additionally, correlation coefficients were generated between **SCREEN** and **TOTAL**.

**RESULTS:** Seventeen individuals completed all of the requirements of the study. When traditional IAD classification was used, **SCREEN** correctly identified 17/17 (100%) of participants as either **IAD+** or **IAD-** compared to **TOTAL**. A significant correlation ( $r=0.736$ ;  $P>0.01$ ) was identified between **SCREEN** and **TOTAL**, wherein 54% of the variance in **TOTAL** was explained by **SCREEN** ( $r^2=0.54$ ).

**CONCLUSIONS:** A three-session bilateral BP screening protocol may be an effective means of classifying the resting IAD status of participants. Future studies assessing acute responses or chronic adaptations of IAD to various stimuli (i.e., exercise, pharmaceuticals) may consider using this simple screening protocol.

## **The Effect of Aerobic Exercise to Alter the Inter-Arm Difference in Blood Pressure**

Kyle Edgar, Jonathan D. Keyser, Chase M. Dillon, Alyssa M. Hahn, Devin N. Meyerriecks,  
Michael E. Holmstrup, Benjamin D.H. Gordon, Brock T. Jensen

Faculty Sponsors: Dr. Brock Jensen, Dr. Michael Holmstrup, Dr. Benjamin Gordon

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### **Oral Presentation**

#### **ABSTRACT:**

Blood pressure (BP) responses to aerobic exercise (e.g., walking, cycling) conditions are well documented in the literature when measured in one arm. However, bilateral BP measurement and specifically the inter-arm difference in BP (IAD+;  $\geq 8$ mmHg) could add additional information regarding underlying heart disease. Previous data from our lab suggests aerobic exercise increases the IAD response in a single instance when a large IAD is not present at rest.

**PURPOSE:** To assess the reproducibility of the effect of aerobic exercise on IAD.

**METHODOLOGY:** Seventeen male participants (18-35y) completed all requirements of the study. Following a strict 15-minute rest, two bilateral BP measures were collected with 5-min between on three separate days (i.e., BASE). BASE were averaged and used to determine the presence of IAD+ or IAD- ( $< 8$ mmHg) at rest. Subsequently, participants engaged in three exercise sessions of equal duration (8-min) and relative intensity (6 METS, 60rpm), each separated by  $> 24$ h. Bilateral BP was measured at every two minutes during exercise (i.e., EX-2, EX-4, etc.) and every five minutes for 30 minutes (i.e., REC-5, REC-10, etc.) into recovery.

**RESULTS:** Seventeen participants completed the three required aerobic sessions for inclusion in the study. A total of 51 aerobic sessions were performed with an overall average exercising IAD of 12.9mmHg, elevated from the average resting IAD of 5.0mmHg. IAD responses within the same exercise bout were consistent across all three days (Day 1: 0.656, 0.735, 0.732; Day 2: 0.264, 0.619, 0.670; Day 3: 0.715, 0.652, 0.833). Alternatively, the interclass correlation between exercise days was weak.

**CONCLUSIONS:** IAD measurements within the same exercise bout appear to be consistent and reproducible. Despite this relationship, more research may be needed to determine day to day variability.

## **Attitudes, Perceptions, and Barriers of Occupational Therapy Practitioners in Transition Planning**

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### **Poster Presentation**

#### **ABSTRACT:**

**Objective:** The purpose of our study was to investigate the perceived attitudes, perceptions, current knowledge and barriers of occupational therapy practitioners working on a transition team with other professionals.

**Method:** A questionnaire was distributed to registered occupational therapists and certified occupational therapy assistants identified as working on a transition team. Twelve participants met inclusion criteria of working as an occupational therapy practitioner in transition services and completed the survey. Sample consisted of 100% of responses from registered occupational therapists, eight females and four males, with the majority reporting a master's degree and one to 21 years of experience, with the majority having minimum of six years or more.

**Results:** The occupational therapy practitioner's knowledge associated with specific topics was not statistically significant related to their level of experience or level of education. However, individual topics related to practice, interventions, best practice, evidence-base practice, post-school support systems, and involving individuals indicated a level of significance related to years of experience. Calculated total perceived knowledge scores were found to be significant when linked to years of experience, but statistical significance was not found when linked to education level. Results also indicated the majority of participants rated their role on the transition team as one of high importance. Perception of barriers were not statistically significant, however several topics that did show significance included lack of assessment tools, awareness, and transition planning education as barriers to involvement in interprofessional practice.

**Conclusion:** Occupational therapists in this study provided insight to the attitudes, perceptions, current knowledge and barriers of the occupational therapy's role on transition teams. A small sample size in this study precludes generalization, but provides important information to guide further studies and practice, as well as increase efforts for the understanding of occupational therapy's role and participation on transition service teams.

## **The Effect of Isometric Handgrip Exercise to Alter the Inter-Arm Difference in Blood Pressure**

Jonathan Keyser, Kyle M. Edgar, Chase M. Dillon, Alyssa M. Hahn, Devin N. Meyerriecks

Faculty Sponsors: Dr. Benjamin Gordon, Dr. Brock T. Jensen, Dr. Michael E. Holmstrup

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### **Oral Presentation**

#### **ABSTRACT:**

Blood pressure (BP) responses during resting and exercise conditions are measured in a variety of settings to evaluate heart health. Traditionally, clinical BP is measured in a single arm. More recently, measuring BP in both arms during rest and assessing the inter-arm difference (IAD+;  $\geq 8$ mmHg) has been shown to address underlying cardiovascular disease more comprehensively. IHE training has been shown to lower BP chronically. Our lab has shown that a single bout of isometric handgrip exercise (IHE) increases acute IAD by 4mmHg, which may indicate a potential to reduce resting IAD.

**PURPOSE:** To examine the consistency of the IAD response to IHE.

**METHODOLOGY:** Seventeen male participants (18-35y) completed all requirements of the study. Following a strict 15-minute rest, two bilateral BP measures were collected with 5-min between on three separate days (i.e., BASE). BASE were averaged and used to determine the presence of IAD+ or IAD- ( $< 8$ mmHg) at rest. Following a series of maximal handgrip measures (MVIC), all participants completed three IHE sessions separated by  $> 24$ h. IHE sessions consisted of four 2-min continual handgrip contractions (alternating hands; 30% MVIC; 1m rest between contractions). Bilateral BP was measured at minutes 1 and 2 (i.e., EX-1, EX-2, etc.) of each contraction. Following the fourth set, bilateral BP was measured every five minutes for thirty minutes (i.e., REC-5, REC-10, etc.) into recovery. Interclass correlation coefficients were calculated within testing sessions and intraclass correlations were performed between testing sessions.

**RESULTS:** Correlation coefficients for within testing sessions: 0.207, 0.037, 0.191, 0.333, 0.124, 0.559, 0.147, 0.079, 0.240. Correlation coefficients between testing sessions: 0.044, 0.257, 0.595.

**CONCLUSIONS:** IAD reliability when measured during isometric handgrip exercise appears low when considering both within testing session and day to day testing session measures.

## **The Effect of an Acute Exercise Bout on Juul Cravings in College-Aged Students**

Megan Pesci, Julia Tremel, Joy Urda, Beth Larouere, Steven Verba

Faculty Sponsor: Dr. Steven Verba

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### **Poster Presentation**

#### **ABSTRACT:**

Juul, a brand of e-cigarettes, are popular for their discreet size, high nicotine content, and flavoring, although negative health effects like respiratory disease exist. Previous research has demonstrated that exercise can mitigate traditional cigarette cravings, and it is possible that this model may be applied to Juul use as well. **PURPOSE:** To examine the effect of an acute bout of exercise on Juul cravings in sedentary, Juul using college students and observe whether there is a delayed onset of the first craving the morning after a bout of exercise.

**METHODS:** Participants came in for three visits in which they were not permitted to Juul. During Visit 1, a questionnaire was completed at baseline and after 10 and 25 minutes of sitting quietly. During Visit 2, participants walked on a treadmill at 40-50% Heart Rate Reserve for 15 minutes, followed by 10 minutes of sitting quietly. The questionnaire was administered at the beginning of the session, immediately after the walking session, and after 10 minutes of sitting quietly. During Visit 3, participants performed 5 different resistance machine exercises for two sets of 12-15 repetitions, lasting approximately 15 minutes. The questionnaire was then administered in the same manner as Visit 2. The morning after each visit, an e-mail was sent to the participants with follow up questions.

**RESULTS:** Six participants (age  $20.8 \pm 1.3$  yrs, Juul use  $15.7 \pm 6.5$  months) completed this study. There was no Treatment x Time effect ( $p > 0.05$ ). There was no delay in urge or usage the following day ( $p > 0.05$ ), with a range of 0-60mins across participants.

**CONCLUSION:** An acute bout of exercise does not appear to affect college-aged students' Juul urge. Strategies to better recruit students who engage in this negatively-perceived health behavior need to be explored.

# GEOGRAPHY, GEOLOGY, AND THE ENVIRONMENT

## **Sand Provenance Across the White River Badlands Toward the Nebraska Sand Hills**

Colton Byers, Cody Brown, Patrick Burkhart, Paul Baldauf, Jack Livingston, Brett McClinton,  
Ellis Peet, Greg Baker

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### **Oral Presentation**

#### **ABSTRACT:**

This study was conducted to test whether White River Badlands sediment is a significant component of the sand in the Nebraska Sand Hills (NSH). This investigation advances our previous work with a new statistical approach while also improving the accuracy of our data. It is predicted that dunes located in the White River Badlands (WRB) downwind of the White River Group (WRG) source rock contain sediment with a maturation signal intermediate between the source rocks and the NSH sand. Previous investigators found systematic changes in mineralogical and textural maturity in the NSH, suggesting dominant continuous downwind transport from NW to SE. In addition, these investigators suggested that Eocene and Oligocene age strata of the WRG in the WRB are a possible source of sand in the NSH. Because the WRG outcrops and WRB dune fields are to the NW of the western section of the NSH, it is possible that sand from this area may have reached the NSH. To test this hypothesis, we collected samples from terraces and floodplains of the Cheyenne and White Rivers, and their tributaries, together with sand samples from NSH and WRB dunes. We analyzed these samples using laser-induced breakdown spectroscopy (LIBS) to identify major element compositions. Our newest interpretation aims to spatially compare the NSH geochemical composition to the suspected WRG source by distance using trends along vectors in component element abundances. The hypothesis to be tested is that if White River Group sediment a source for the western NSH, then major element composition should reflect sand maturation with distance from the proposed source.

## **A Glimpse into a Middle Devonian Ecosystem: Penn Dixie Fossil Beds, Erie County, New York**

Carly Leventhal

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### **Poster Presentation**

#### **ABSTRACT:**

Penn Dixie Fossil Quarry and Nature Reserve is an educational center located in Erie County, New York. It provides an opportunity for individuals to explore the geology and paleontology of Western New York. The Reserve allows visitors to collect fossils to study and to dig for simple fascination. The diverse fossil assemblage preserved in the rocks provide researchers with a unique opportunity to learn about life in the past. The fossil faunas collected at this location were used to reconstruct the Middle Devonian (393-382 million years ago) paleoenvironment. The Devonian was a pivotal period in the history of life on Earth as plants were beginning to populate land and early tetrapods were experimenting with life out of the water. Marine invertebrates were also thriving in newly formed tropical marine environments. Intense tectonism was occurring as island arcs began to accrete to the eastern margin of North America. This resulted in a mountain range along the east coast with extensive, deltaic river systems draining toward the west into an interior marine basin. Life thrived along the edge of the delta, and diverse organisms interacted forming unique ecosystems. The rocks deposited at this location belong to the Middle Devonian Hamilton Group, specifically the Windom Shale of the Moscow Formation. This soft, fissile, medium-grey shale contains abundant fossil brachiopods, corals, trilobites, echinoderms, and bryozoans. The bryozoan and solitary rugose corals formed thickets that provided habitats for the trilobites, echinoderms, and brachiopods to flourish. The faunal assemblage collected from Penn Dixie Fossil Quarry represents this unique ecosystem thriving along the edge of a well oxygenated marine basin during the Middle Devonian.

## **The Relationship Between Cooling History and Grain Size in Igneous Intrusions**

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### **Poster Presentation**

#### **ABSTRACT:**

Despite the well-known connection between the grain size of an igneous intrusion and the cooling rate of its magma, quantitative relationships between crystal characteristics and magma cooling history have remained elusive. This research project seeks to address this problem through scanning electron microscope (SEM) analysis of crystal size, shape, composition, and variation at different depths within two 1.1-billion-year-old sills from Kama, Ontario. Crystal size distributions were collected via automated image analysis for magnetite/ilmenite and via manual tracing for pyroxene. Mean crystal sizes for both minerals were greatest at the middle depths and smallest at the upper and lower margins, where the magma was rapidly cooled in contact with the surrounding country rock. It is hoped that the correlations between grain size (observed) and cooling history (calculated using numerical modeling and thermodynamic simulations) can ultimately be used to derive empirical relationships that hold for other similar systems.

# HISTORY

## **A “New Philosophy of Slum Rehabilitation”: Environment and the Law in the Pittsburgh Renaissance**

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### **Poster Presentation**

#### **ABSTRACT:**

In the 1940s and 1950s, state and federal legislators passed laws concerning urban redevelopment and environmental reform. This introduced environmental rhetoric of blight, slums, urban renewal, and public health and welfare into the law. This study argues administrators in Pittsburgh, Pennsylvania used the legal rhetoric of the environment, public welfare, blight, and slums established in state and federal laws to publicly associate community immorality with black neighborhoods, justifying a controversial “Renaissance” project that removed 8,000 black residents from the city’s Lower Hill District. It examines the concept of “blight” as an environmental term used purposefully and strategically in both legislation and administration of urban redevelopment projects in Pittsburgh. It specifically analyzes how administrators applied environmental legal rhetoric of blight to implement urban renewal projects at the municipal level. Primary source material includes legislation and case law to examine environmental rhetoric, newspapers to analyze public opinion, and local administrative reports and publications to identify how administrators used environmental rhetoric in official documents.

In 1945, Pennsylvania legislators began passing legislation to eradicate blight from urban communities, justifying their legislation as an extension of the state’s historic prerogative to uphold the public health and welfare. State laws addressing urban redevelopment and the environment introduced rhetoric associating blight with traditional environmental concepts like land use and air quality. By the mid-twentieth century, an enlarged federal bureaucracy passed laws to codify its financial support for local redevelopment, capitalizing upon environmental rhetoric established in state laws while also introducing new language of slums and urban renewal. This environmental legal language provided rhetorical tools for Pittsburgh administrators to influence public opinion in favor of controversial renewal projects in black neighborhoods by emphasizing a connection between morality, race, and residential redevelopment of slums.

# INTERDISCIPLINARY PROGRAMS

## **Descartes is Problematic, Love Feminism**

Margaret Calvert

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### **Oral Presentation**

#### **ABSTRACT:**

The mind-body problem plagues many philosophers. Rene Descartes attempts to explain this problem through the theory of dualism in his work *Meditations on First Philosophy* in 1641. The implications of dualism have been problematic for marginalized groups including women and disabled people. In my presentation, I will discuss these implications and critiques of Descartes's work from a feminist perspective using the works of Foucault, Nye, McHugh, de Beauvoir, MacKinnon, Gertler, and Code. I will argue that an embodiment approach to the mind body problem is a better way to approach the issue than the disembodiment approach that Descartes chooses.

## **Meet the Neandertals**

Nicholas Grimm, Zachary Rogers, Kendal Keech, Megan McCarthy

Faculty Sponsor: Dr. Aksel Casson

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### **Poster Presentation**

#### **ABSTRACT:**

The use of role-playing games (RPGs) in university courses is increasingly common in the humanities and social sciences, most notably within the discipline of history. Here we describe our efforts to construct a multi-week unit of instruction for an introductory anthropology course designed around issues of culture contact, archaic hominins, and the ethics of anthropological fieldwork. The game aims to give students the opportunity to think critically, work together, and negotiate complex hypothetical situations.

## **Preliminary Excavations at Wolf Creek, A Prehistoric Site in Western Pennsylvania**

Nathan Kilmas, James Jablonski, Alyssa Smith, Megan McCarthy

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### **Poster Presentation**

#### **ABSTRACT:**

We present here a report of initial archaeological excavations of the Wolf Creek Site (College II, 36 BT 0507), a hypothesized Late Archaic site in Butler County, PA during the Summer/Fall of 2019. Survey and excavation along portions of Wolf Creek in Slippery Rock, PA, suggest a series of short-term occupations extending from the Late Archaic to historic periods. This preliminary interpretation is based on the identification of multiple hearth features and moderate quantities of flakes and debitage of local chert, including concentrations of tertiary flakes that we believe to be consistent with Late Archaic patterns. This project is a collaboration between Slippery Rock University student volunteers, retired professional archaeologists, and amateur local archaeologists as part of a larger effort by the university's Anthropology program to develop Service Learning and Community Engagement opportunities in Butler County.

# MATHEMATICS AND STATISTICS

## **Visualizing Future Yield of Stock Portfolios by Simulation**

Mark Downey

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### **Oral Presentation**

#### **ABSTRACT:**

This project uses statistical and analytic software to create an interface that will allow a user to select one or more portfolios of stocks. A Brownian motion model is used to predict future portfolio value. This model was formulated by using historical monthly stock price data. For each potential portfolio, prices are simulated based on this model in order to predict yield and return on investment at some future date. This interface will enable investors to optimize their portfolio by comparing future yield and return on investment for several potential mixes of stocks.

# MUSIC

## **Unconventional Ways of Playing Percussion Instruments in Music Therapy**

Abigail Metcalf, Julia Miller

Faculty Sponsors: Vern Miller, Dr. David Glover

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### **Performance**

#### **ABSTRACT:**

Although the correct way to play percussion instruments is used in a professional performance setting, some of the techniques and physical requirements may not be practical for all clients in a music therapy setting due to a client's physical or cognitive abilities. The American Music Therapy Association defines music therapy as "the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program". Within a music therapy session, it is not uncommon to use a percussion instrument, however, it may be uncommon to see the instruments being played as demonstrated in a percussion textbook. Just like most things in life, there is never only one way of doing something. In my presentation, I will demonstrate six alternative ways of using percussion instruments in a music therapy setting with a focus on specific domains. These domains include gross motor, fine motor, sensory, social, and musicality. Each technique is presented in the form of a music therapy intervention.

# OFFICE FOR COMMUNITY- ENGAGED LEARNING

## **From Doing Reflection to Being Reflective: Activating Student Leadership, Ethical Engagement, and Civic Imagination**

Nikol Damato, Sam Hauser, Jeffrey Rathlef, Bibi Al-Ebrahim

Staff Sponsor: Jeffrey Rathlef

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### **Oral Presentation**

#### **ABSTRACT:**

This session will showcase an evolving model from Slippery Rock University's Global Service-Learning programs that have leveraged the utilization of critical reflection in innovative and non-traditional ways. From re-framing the roles and functions of student leaders as peer educators, the examination of Fair Trade Learning as a basis for ethical community engagement and critical consciousness, to the application of resources through a civic imagination project, SRU's GS-L programs have leveraged the roles and functions of critical reflection in ways that have assisted the programs in reaching new heights in high impact practice and transformational experiences for students and communities. By re-conceptualizing reflection from program activity to reflection as program strategy, SRU's Global Service-Learning programs have integrated what otherwise would be disparate program components into a more integrated and cohesive whole that enhances each and reinforces all.

## **Shelter Sidekicks: Community-Engaged Theory in Practice**

Sam Hauser, Olivia Black, Sarah Malogrino

Staff Sponsor: Laura Villers

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### **Poster Presentation**

#### **ABSTRACT:**

This project examines community-engaged theory, specifically the expression of reciprocity, and its impact on campus and community constituents. To explore community-engaged theory in practice, research is drawn from Shelter Sidekicks, a service-learning program under the Office for Community-Engaged Learning in partnership with Butler County Humane Society. Evidence is collected from self-assessments taken by program participants throughout the program, group reflections, and interview feedback from our community partner and student participants.

Community-engaged theory investigates the relationship dynamic between service, engaged learning, and the growth of community connections, in pursuit of civic identity development. Reciprocity, as a component of this theory, reframes the exchange of those providing and those receiving service. The idea of reciprocity posits that in a service relationship, both parties should dually give and receive within the relationship, in a way that is power-conscious and mutually-beneficial to the knowledge, skills, and needs of both parties.

Shelter Sidekicks is a program that unites student volunteers from the university and two local animal shelters, the Butler County Humane Society and Lawrence County Humane Society. Throughout the semester, students volunteer a minimum of 12 service hours in either shelter and participate in four reflections focusing on animal rights and advocacy topics. Volunteers assist staff in routine shelter activities and have the opportunity to socialize animals in preparation for adoption. While volunteering provides students the service experience and community connection, reflections present an intentional space to connect their experience to larger social issues, the impact of service, and the development of civic identity.

Shelter Sidekicks is currently on its fourth year running as a co-curricular service-learning program at Slippery Rock University. The goal of this project is to share collected data to reveal community-engaged theory in practice and the impact of reciprocity between the students and community partners, and to examine potential opportunities for program and partnership improvement.

## **Habitat for Humanity: Two Strategies Towards Developing Civic Identity in College Students**

Sam Hauser, Jenell Gerow, Destiny Yount, Shannon Rose, Dean Chasser

Staff Sponsor: Laura Villers

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### **Poster Presentation**

#### **ABSTRACT:**

The overarching goal of this project is to quantitatively and qualitatively evaluate two strategies for engaging civic identity development through the Habitat for Humanity Collegiate Challenge program occurring during spring break 2020. Programs are evaluated based on predetermined civic learning and engagement outcomes. Evidence will be gathered from pre- and post- program assessment, testimonials, and reflections.

The Collegiate Challenge is a national program designed for students to participate in immersive service-learning towards civic identity development. Student leaders will plan the programs and engage students in reflections before, during, and after the program regarding civic identity and the affordable housing crisis.

During the Michigan program, leaders will facilitate the exploration of civic identity through national issues surrounding housing affordability and homelessness. This will be achieved through discourse-based reflections aimed at recognizing housing instability and insecurity and discovering possible actions that students can take to combat these social problems. Student learning outcomes will be selected and assessed on gained understanding in regard to awareness of disparities and impacts of power and privilege, students' abilities to reflect on experiences to gain insight and encourage action, and the integration of knowledge, skills, and examined values to challenge injustice at its root causes.

Student leaders on the Virginia program will be engaging participants through their understanding of the public purpose of one's academic discipline and/or chosen profession, the ability to reflect on experience to gain insight and guide action, and the capacity for empathy, open-mindedness, and commitment to inclusive diversity. This learning will be supported by introducing participants to issues surrounding affordable housing and poverty locally and globally, introducing participants to civic identity and leadership, and helping participants recognize their civic identities by connecting them to social issues they can act on during the experience and beyond.

# PARKS, CONSERVATION, AND RECREATIONAL THERAPY

## **Aquaponics May Yield Plant Productivity Two-Times Faster Than Traditional Agriculture**

Paul Hedzik, Joshua Magyar, Dr. Shawn K. Davis, Joshua Magyar

Faculty Sponsor: Dr. Shawn Davis

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### **Poster Presentation**

#### **ABSTRACT:**

Aquaponics is a way to grow food that combines aquaculture: the raising of aquatic species such as fish, and hydroponics: growing plants without soil. Aquaponics is the integration of recirculating aquaculture and hydroponics in one production system. The main goal in conducting this research project was to test the hypothesis that aquaponics can yield ready-to-harvest food twice as fast as traditional, soil agriculture (Somerville et al., 2014). This project compared the growth rates of organic lettuce grown with traditional agriculture methods against the same variety of lettuce grown in a large-scale aquaponics system. Along with the growth rates, inputs of water and nutrients were also recorded to further test differences in requirements for both methods. This also served to test the secondary hypothesis; that aquaponics uses 90% less water than traditional agriculture (Somerville et al., 2014). The results were expected to indicate the production benefits of aquaponics when compared with traditional agricultural methods, however, the results show that this was not the case in this particular study environment. All research was conducted at the Robert A. Macoskey Center for Sustainability Education and Research at Slippery Rock University.

# PHILOSOPHY

## **A Phenomenological Account of Stand-Up Comedy**

Aleksander White

Faculty Sponsor: Dr. Thomas Sparrow

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### **Oral Presentation**

#### **ABSTRACT:**

In my paper, I utilize Martin Heidegger's phenomenological conception of Dasein from his book, *Being and Time*, to assume the perspective of an audience member in a stand-up comedy club. This conception provides a foundation for exploring why a person wants amusement and how that person is able to seek it out. Next, I use Gernot Böhme's book, *Atmospheric Architectures*, to show how communication between people generates an atmosphere through their choice of language. I include additional excerpts where Böhme discusses the atmosphere of spaces to further ground the atmosphere of a comedy club as a unique space, specifically for comedy. I then briefly discuss a popular theory of comedy called the Benign Violation Theory (BVT) to show how established theories of comedy can deepen this burgeoning philosophical discussion of stand-up comedy. Lastly, after discussing BVT, I show how other audience members can enhance or diminish the experience of seeing a comedian in a comedy club.

# PHYSICAL AND HEALTH EDUCATION

## **Cardiorespiratory Benefits of Table Tennis Games and Footwork Drills for Older Players**

Kylie Fenstermacher, Emily Shultz

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### **Poster Presentation**

#### **ABSTRACT:**

**PURPOSE:** The purpose of this study was to determine older recreational table tennis players' cardiorespiratory training intensities while playing table tennis matches and performing two commonly used footwork drills.

**METHODS:** Thirteen healthy recreational table tennis players (Age:  $61.9 \pm 4.8$ , 8 males) completed the study. On day 1, participants played five table tennis matches against different opponents (best 3 out of 5 games). On day 2, participants performed the "two-position" footwork drill at gradually increasing intensities until they reached vigorous exercise intensity based on ACSM's heart rate recommendations for their age. Exercise intensity was controlled by a table tennis robot (ball feeding machine) that increased the ball feeding rate every three minutes. On day 3, participants performed the Falkenberg (three-position) footwork drill following protocols similar to day 2. During all testing, Sigma PC26.14 heart rate monitors were used to collect heart rate data on each match played, and on each 3-minute footwork intervals.

**RESULTS:** During table tennis games, participants spent 23.4% of the time in light exercise intensity zone, 40.5% of the time in moderate intensity, 32.0% in vigorous intensity, and 4.2% in maximum intensity zones. During the two-position footwork drills, on average,  $33.0 \pm 7.1$  ball/min feeding rate provided the participants with moderate intensity exercising, while  $44.5 \pm 3.6$  balls/min rate corresponded with vigorous exercising. During the Falkenberg drill, higher feeding rates were needed for corresponding intensities:  $38.9 \pm 10.5$  balls/min for moderate intensity, and  $48.4 \pm 7.2$  balls/min for vigorous intensity exercising.

**CONCLUSION:** Aging recreational players spend significant amount of time in the moderate to vigorous cardiorespiratory intensity zones while playing games. Footwork drills can provide additional training benefits, even at a much lower ball feeding rate than what young adult table tennis players use.

# PHYSICAL THERAPY

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## Physical Therapy Service-Learning in Arequipa, Peru

Jared Todorowski, Justin Eby, Michael Fabrick

Faculty Sponsor: Dr. Mary Ann Holbein-Jenny

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### Oral Presentation

#### ABSTRACT:

On July 21st to August 3<sup>rd</sup>, 2019, four Slippery Rock University DPT students embarked on a service learning opportunity in Arequipa, Peru. In order for this project to happen, several months were dedicated to raising funds, gathering medical equipment, and working through all the logistics to make the trip happen. The group of students volunteered through Medical Ministry International (MMI), an organization dedicated to “establishing and supporting health care centers in developing countries with the goal of increasing access of affordable, quality health care.” Our physical therapy team consisted of nine members: four students from Slippery Rock University, three Peruvian physical therapists, and two translators. While in Peru the team visited three different clinics and treated around 300 patients. The first week was spent at a local clinic in Arequipa, where the patients varied in age, economic status, and diagnosis. The second week was spent in Juliaca and Puno. In Juliaca, they worked out of a local church and the team spent most of the day working with pediatric patients, as well as fitting wheelchairs for those who needed them. In Puno, they were placed at a local school and treated primarily pediatric patients. During this trip students were able to help underprivileged Peruvians receive much needed physical therapy services. They were able to learn about medical procedures in a developing country and the different approaches to rehabilitation that were practiced by the Peruvian therapists. Each member of the team focused on becoming a better practitioner while learning to be charitable with their skills.

# PHYSICS AND ENGINEERING

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## Predicting the Thermodynamic Properties of Fluids Using Neural Networks

Zane Bayer

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### Oral Presentation

#### ABSTRACT:

Machine learning techniques have proved useful in various fields including business, medicine, transportation and fields in the physical sciences such as particle physics. This research aims to gauge the effectiveness of deep learning techniques in modeling thermodynamic systems. Specifically, the work optimizes a multi-layer neural network to quantitatively fit the van der Waals equation of state for single component system and mixtures. Multi-layer neural network connections each have weights and biases which represent their importance within the network. These weights and biases are adjusted with the backpropagation algorithm to create accurate predictions. The research applies these principles to predict the pressure given by the van der Waals equation given volume, temperature, and number of molecules as inputs. The van der Waals model is a modification of the Ideal Gas law. The model was conceived in 1873 by Johannes van der Waals to describe more accurately the qualitative behavior of fluids within a mathematical model. The model is described by van der Waals equations and it can be extended to mixtures. By training a neural network to fit to van der Waals model, we plan to understand how the choice of hyperparameters (number of layers, number of neurons etc.) affects the accuracy of the predictions. Future work aims to apply similar techniques to predict the equations of state for various fluids whose thermodynamic properties have no accurate mathematical description.

## **Study of Optical Properties of Composite Layers of MEH-PPV Nanopillars and PEDOT:PSS Films**

Evangeline Beeching, Archana Kumari

Faculty Sponsor: Dr. Archana Kumari

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### **Poster Presentation**

#### **ABSTRACT:**

Fabrication of MEH-PPV nanopillars was completed using porous Anodic Aluminium Oxide (AAO) templates. The diameter and height of the nanopillars was controlled by adjusting the dimensions of the template. The morphology of the nanopillars was studied using scanning electron microscopy. The absorption of light of MEH-PPV nanopillars plus thin film was greater than that of the thin film only, both being the same thickness. The dimensions of nanopillars are essential for carrier processes such as exciton generation, exciton diffusion and carrier dissociation and transport. As PEDOT:PSS can enhance hole collection and exciton diffusion, addition of PEDOT:PSS improves the performance of solar cells. The variation in optical properties of composite material consisting of MEH-PPV nanopillars and PEDOT:PSS films will be investigated using UV-Vis spectroscopy and fluorescence spectroscopy with change in height and diameters of the MEH-PPV nanopillars.

## **Investigating Electron Transport using Kinetic Theory**

Ashton Bloom

Faculty Sponsor: Dr. Dustin Hemphill

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### **Poster Presentation**

#### **ABSTRACT:**

Progress toward the study of electron transport properties in exotic materials, such as graphene, is discussed. Kinetic theory provides a theoretical framework in which to study non-equilibrium dynamics. Numerical solutions to the relativistic Boltzmann equation are found by stochastically estimating collisions rates within spatially discretized cells. As a first step, the case of a massless gas in a static box is considered. Both the development and testing of the algorithm will be discussed.

## **A Machine Learning Approach Related to Well-Log Correlation**

Travis Braund

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### **Oral Presentation**

#### **ABSTRACT:**

Machine learning has high potential and can be applied to predict and optimize various processes. It has many applications for complex tasks and those that people do every day. Machine learning is a subfield of artificial intelligence. Machine learning can be used to find and analyze data, recognize patterns, and extract materials from internet. There are many forms of Machine learning; supervised, unsupervised, semi-supervised, and reinforcement. The model is composed of a dataset and a model is set up to train the known data. Then the model trains and learns more in order to predict unknown outcomes. It is consistently tuned to reevaluate known outcomes to make predictions as accurate as possible.

In the petroleum industry it can be applied in many forms such as geological studies, maintenance of petroleum equipment, and production engineering. This research is developed around modeling well-log data to optimize and make predictions for the future using stratigraphic correlation techniques. Common type of well-log data is resistivity versus depth. Normally, the higher the resistivity the less water saturation. Water at deeper depths contains a lot of salt so it is highly conductive, which means less hydrocarbons are present. However, higher resistivity generally correlates to more hydrocarbons being present. We are currently working on the model that should recognize the well-log patterns. It is intended to (1) be used to interpret well data, (2) being trained on added datasets, (3) make predictions for oil and gas production optimization from new or existing wells.

## Molecular Simulation of Enhanced Oil Recovery in Shale

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Faculty Sponsor: Dr. Mohammad Kazemi

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### Oral Presentation

#### ABSTRACT:

The physics behind N<sub>2</sub> and CO<sub>2</sub> injection into organic nanopores of shale is investigated using molecular dynamics simulations. Two 3D kerogen nanochannels with 2 and 5 nm diameters, based on the kerogen unit molecules prepared by Ungerer et al. 2014, are created along with synthetic oil mixture created based on the experimental study of phase behavior of petroleum mixtures performed by Turek et al. (1984). Nitrogen and supercritical CO<sub>2</sub> (sCO<sub>2</sub>) are then injected into the channel at different pressures and oil recovery factors are computed. The density profiles of injected gases and synthetic oil is also investigated at various injection pressures.

The simulations demonstrated that the injection pressure plays an important role in the required soaking time. Higher sCO<sub>2</sub> injection pressure requires more soaking time for the gas to be mixed with synthetic oil completely. Furthermore, there is an optimal soaking time after which no more improvements could be achieved in recovery factor. Better production recovery factors were achieved at higher sCO<sub>2</sub> injection pressures. However, the rate of recovery factor improvements dropped as injection pressure increases. Therefore, there is an optimal value of injection pressure. The sCO<sub>2</sub> have a tendency to be adsorbed to the surface of kerogen and desorb synthetic oil molecules. However, the lighter components desorb faster than the heavy (C<sub>7</sub>+) components. The recovery factors of synthetic oil ranges from 24.4 to 49% which is consistent with experimental measurements. The heavier components recovery is much smaller than the lighter components as they have more adsorption capability. The sCO<sub>2</sub> were found to have a higher recovery factor compared to those of N<sub>2</sub>. This is due to the fact that sCO<sub>2</sub> has higher adsorption capabilities to kerogen surface. It is shown that sCO<sub>2</sub> have a better capability in EOR applications compared to N<sub>2</sub>.

## **Interfacial Tension Measurement of Petroleum Mixtures Using Both Experimental Measurements and Molecular Simulations**

Quintin Held, Justin Svetz

Faculty Sponsors: Dr. Mohammad Kazemi, Dr. Athula Herat

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### **Oral Presentation**

#### **ABSTRACT:**

#### **Objectives/Scope:**

The objective of this work is to study the interfacial tension of CO<sub>2</sub>/oil mixture, both experimentally and using molecular simulations. We aim to confirm the validity of molecular simulation and to prove it as a reliable method to calculate interfacial tension.

#### **Methods/Procedures/Process:**

The experimental measurements were calculated using the Core Lab Pendant Drop Interfacial Tension System. The pendant method calculates the curvature of the synthetic oil drop, surrounded by CO<sub>2</sub>, to determine the interfacial tension between the mediums. Using this method, we validated our experimental measurements with Robinson et al. (1986) by comparing the results of CO<sub>2</sub> and n-Decane system. Once the experimental method was validated, experimental measurements of a mixture of CO<sub>2</sub>/synthetic oil was performed. Molecular simulations of interfacial measurement calculations for the same system was performed using LAMMPS software using a coarse-grained forcefield. Simulations were performed at constant pressure-temperature (NPT) ensemble and the results were compared with experimental measurements.

#### **Results/Observations/Conclusions:**

Our IFT experimental measurements of CO<sub>2</sub>/C<sub>10</sub> mixture were matched very well to those of Robinson et al. (1986). This validated our IFT measurements method. The synthetic oil/CO<sub>2</sub> IFT measurements were performed for temperatures ranging from 100-150 degrees Fahrenheit and pressures from 4-14 Mpa. The experimental measurements and molecular simulations calculations matched very well for the synthetic oil/CO<sub>2</sub> mixture. The results proved the proficiency of molecular simulations to accurately determine interfacial tension at various reservoir conditions. Therefore, it provides a powerful tool to save time and cost of experimental measurements and can be used to complement these measurements.

#### **Explanation of how this can benefit a practicing engineer:**

The findings reduce the industry's reliance on costly experimental research to determine interfacial tension at reservoir temperatures and pressures. With the validation of molecular simulation as a method of calculating interfacial tension, the reliance on experimental measurements is mitigated.

## **Study of Friction Reducers Performance Applied to the Marcellus Shale Region**

Morgan McIntyre, Viacheslau Kudrashou, Mohammad Kazemi

Faculty Sponsor: Dr. Viacheslau Kudrashou

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### **Poster Presentation**

#### **ABSTRACT:**

Polyacrylamide-based friction reducers (FRs) are widely used in hydraulic fracturing to reduce friction created within fluid as it flows through small-diameter tubulars or other restrictions. These polymers generally add viscosity to the fluid to reduce turbulence as fluid flows. The type and amount of total dissolved solids (TDS) in source water have a significant impact on the performance of FRs. This study investigates these effects and evaluates various types of FRs applied to the Marcellus Shale region.

Various FR types were evaluated in this work – freshwater FRs; cationic FRs for mid-salinity brine; anionic high TDS FRs, and viscosity-building FRs (VFR). Both powder and emulsion form of samples were tested. Analysis of the friction-reducing performance, optimal dosage, and critical TDS was conducted using a computer-controlled friction flow loop and rheometer. Both synthetic and field source water were used.

It was found that an increase in salinity often causes significant performance degradation. This is critical for application of FRs in Marcellus shale that is known for challenging brine contents. Addition of surfactant systems can improve FR performance by extending the salt tolerance. Overall it can be concluded that FR optimization for given water content and proppant can be done by adjusting FR type and/or concentration.

This work explores the application of various types of FRs for the Marcellus Shale region. It defines the critical TDS levels, and types of cations that require changes in FR type or dosage. This data can benefit operators in (1) optimizing performance of the FR-based completion fluid; (2) avoiding formation damage associated with usage of unjustified additives; and (3) comparing/qualifying FRs based on their optimal range of application and economical dosage.

## **Design and Implementation of Cooled Scanning Probe Microscope**

Andrew Smeltzer, Robert Taylor, Andrew Merritt, Sagar Bhandari

Faculty Sponsor: Dr. Sagar Bhandari

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### **Oral Presentation**

#### **ABSTRACT:**

The ability to measure and manipulate properties of nanoscale structures gives insight into the physics of these structures and their possible applications in today's technologies. The scanning probe microscope we designed is cooled to liquid nitrogen temperature by being placed in a Teach Spin cryostat. The imaging technique relies on a conductive scanning tip that acts as a local, movable electrostatic gate. The tip is moved within a micron of the sample by the coarse positioning system which was made using CNC milling techniques. Then, by applying high voltages to a piezo tube, the tip is moved over the sample following a raster scanning pattern. The conductance is measured as a function of tip position while the tip moves across the material. With this method, we plan to image the viscous flow of electrons in graphene at liquid nitrogen temperature. Our design allows us to image electron flow in other nanoscale materials.

## **Design and Construction of Scanning Probe Microscope Retrofitted to Tabletop Cryostat**

Robert Taylor, Andrew Smeltzer, Andrew Merritt

Faculty Sponsor: Dr. Sagar Bhandari

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### **Oral Presentation**

#### **ABSTRACT:**

The ability to examine the quantum properties of various materials contributes to understanding the underlying physics of such materials for better applications in new technologies. The construction of a scanning probe microscope allows the study of quantum properties by first cooling the sample to near liquid nitrogen temperatures in a cryostat to be able to view quantum effects. Then the sample is found using a motor-driven coarse positioning system which is mounted as a vacuum-tight appendage to the cryostat. Finally, a conductive scanning tip, that acts as a local, movable electrostatic gate, is moved over sample following a raster scanning pattern to map the material and its quantum properties. Included in the design of the microscope is the coarse positioning system for the sample, the vacuum vessel attached to the cryostat, and the electronics to run the experiments. The construction of the microscope involves a variety of different techniques including 3D printing and CNC milling of parts. Once constructed, the scanning probe microscope will be used to image the viscous flow of electrons in graphene and other materials.

## **Signature of Viscous Electron Flow in Graphene Using a Scanning Probe Microscope**

Michael Zirpoli

Faculty Sponsor: Dr. Sagar Bhandari

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### **Oral Presentation**

#### **ABSTRACT:**

Graphene is a single layer of carbon atoms held together in a hexagonal crystalline structure. Graphene has shown great promise in electronics and photonics because of its two-dimensional properties. These properties reduce the scattering of electrons that are seen in metals, and thus graphene has the ability to be much more conductive than commonly used conductors such as copper. In graphene, at certain range of temperature and electron density, electrons begin interacting with each other in such a way that they start acting together as a viscous fluid. The purpose of this paper is to model the viscous flow of electrons in graphene and analyze the fluid behavior. The model of an incompressible fluid using the Navier-Stokes equations will be created to examine this behavior. The goal is to construct the best geometry and determine suitable boundary conditions for the walls and circular object. The walls act as the edge of the graphene strip, and the circular obstacle acts as the tip perturbation of a scanning probe microscope. The objective is to obtain a suitable geometry showing signature of viscous electron flow.

# PSYCHOLOGY

## **Moral Reasoning, Religious Engagement and Perceived Stress in Higher Education**

Riley Keffer, BayLee Lehr, Meaghan Hazelett, Julia Milo

Faculty Sponsor: Dr. Elizabeth Boerger

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### **Poster Presentation**

#### **ABSTRACT:**

As the number of students experiencing high levels of stress has increased, there is an increasing responsibility on institutions to increase students' ability to manage stress. This requires identifying factors associated with higher levels of stress, as well as protective factors. Paradoxically, advances in moral reasoning may increase stress because students who are reasoning at a higher level may be more aware of differences between peers' expectations for deviant behavior and their own desire to avoid deviant behavior; second, these students may be more aware of the harm caused to persons affected by social issues (e.g., discrimination). Thus, the primary research question addressed by this project is: Do college students with higher levels of moral reasoning report higher levels of perceived stress? If so, is stress related to students' awareness of peer pressure to engage in deviant behavior and/or awareness of social injustice? One possible protective factor is religious engagement. Thus, a second research question is: Is religious engagement a protective factor in the relationship between moral reasoning level and perceived stress?

Data collection is underway for this study. The proposed sample includes 120 SRU undergraduate students. Students will complete an online survey including the DIT-2, a commonly used measure of moral reasoning; the Social Empathy Index (SEI) and Resistance to Peer Influence (RPI) scales, the Perceived Stress Scale, and the Santa Clara Strength of Religious Faith Questionnaire (SCSORF). Data will be analyzed using linear regression and mediation analysis to explore relations between each of the independent variables, and interactions among independent variables, and level of perceived stress.

Results are expected to provide insight on sources and protective factors in students' experiences of stress, which will facilitate efforts to support students in higher education.

## **Feelings of Belongingness: Inclusive vs. Exclusive Pronoun Usage**

Kourtney Kotvas, Amanda Reichert, Sydney Kresconko, Emily Keener, Ph.D., Catherine Massey, Ph.D.

Faculty Sponsor: Dr. Emily Keener

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### **Oral Presentation**

#### **ABSTRACT:**

To determine whether the singular use of “they/them” functions as a gender-inclusive pronoun, we compared perceptions of a job advertisement using either inclusive (s/he or they) vs. exclusive (he) gender pronouns. Our central hypothesis was that pronoun type would influence whether participants’ belongingness or whether they identified with the job and were motivated to pursue vs. a job where they would feel sexism and ostracized. According to Stout and Dasgupta (2011), when the gender-exclusive (he) pronouns were used to refer to both men and women, both men and women perceived the job description to be more sexist than participants in the conditions using inclusive gender pronouns (s/he). However, women reported less belongingness (greater ostracism, less motivation, and less identification) than men. We extend this research by testing the singular use of “they/them.” We predicted that women’s perceptions of belongingness would be isolated to the exclusive condition and would not vary according to which of the two inclusive pronouns were used. Additionally, we predicted that “they/them” pronouns would function as gender-inclusive pronouns. To test this hypothesis, 381 participants ages 18-24 were randomly assigned to read a job advertisement using one of three pronoun types (He, S/he, They). Next, participants’ belongingness (sexism, ostracism, motivation, identification) was assessed. As predicted, the main effect of type of pronoun type on sexism indicated that both men and women were more likely to perceive the job advertisement as sexist when gender-exclusive pronouns were used. Additionally, compared to men, women reported less belongingness (i.e., greater ostracism, less motivation, and less identification) when the gender-exclusive (v. inclusive) pronoun was used. As predicted, men and women’s perceptions of the job described did not vary depending on which gender-inclusive pronoun was used (s/he vs. they). As such, the singular use of they/them functioned as a gender-inclusive pronoun.

PUBLIC HEALTH AND  
SOCIAL WORK

## **The 12-Step Program and Medication-Assisted Treatment Approaches**

Angela Kenbok

Faculty Sponsor: Dr. Christophas Walker

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### **Oral Presentation**

#### **ABSTRACT:**

This paper describes the differences and similarities between a 12-step program (TSP) such as Alcoholics Anonymous (AA) and/or Narcotics Anonymous (NA) compared to medication-assisted treatment (MAT), which uses FDA-approved medications, in a recovering addict's sobriety. It is argued that those who choose to use medication-assisted treatments are simply replacing one substance with another and are not strong enough to live a lifestyle of abstinence. MAT has three different types of stigma attached to it, which include; public, interpersonal, and self-stigma. Although TSP has been one of the most effective substance abuse treatments since 1935 and is used all over the world, it also has a stigma attached; to always practice complete abstinence from all substances. This hard-nosed outlook can be discouraging of those individuals who may choose to recover with MAT and those who may or may not want to also participate in a TSP or support system in addition to their MAT. The study provided in this paper will prove that both forms of treatment are equally effective, while also stating how there could be more education and support systems in place when it comes to MAT, including self-help groups similar to TSP. This would make medication-assisted treatment more easily accessible to those in need of it and place it on a level with the more well-known 12-step programs, as well as lessening the stigma attached to it. The study presented within this paper will include a sample of adult males and females within a drug and alcohol treatment facility that will be interviewed and surveyed over a period of two, four-week cycles in order to properly measure the re-occurrence of those clients who are or were on maintenance medications versus those who are or were practicing an abstinence-based approach.

## **Bereavement Behind Bars**

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### **Oral Presentation**

#### **ABSTRACT:**

This research intervention was a grief and loss support group in a women's state prison (SCI Cambridge Springs). The purpose of the study was to see if the use of animal-assisted (AA) therapy is more effective than non-AA therapy when aiding incarcerated women in dealing with grief and loss, in addition to decreasing the amount of distress from the loss. 32 incarcerated women who were coping with a recent or unresolved loss were participants for this study. A total of four (six-week) groups were provided, two with therapy dogs and two without. In AA groups, two therapy dogs were available for comfort and support while participants discussed their loss. During sessions one and six, two assessment measures, the Core Bereavement Items (Burnett, 1997) and Prolonged Grief Disorder (Prigerson & Maciejewski, n.d.), were obtained. Sessions two through five included discussion and sharing based on Worden's tasks of grief; worksheets were provided to help women better express themselves. Based on the Core Bereavement measure, both groups experienced a reduction in total symptoms of bereavement, experiencing images and thoughts of a lost loved one, and experiencing feelings of sadness or loneliness; however, only the AA group had a significant decrease of separation. For the Prolonged Grief measure, both groups experienced a significant decrease in separation distress and cognitive/emotional/behavioral symptoms; however, only the AA group had a significant decrease in the duration of symptoms and functional impairment. In the AA group, four women met the diagnostic criteria for prolonged grief disorder (PGD) at pre-test, but none met the criteria at post-test. In the non-AA groups, five women met the criteria at pre-test, and 2 at post-test. In the AA group, 71% of the women found sessions "extremely supportive", but for the non-AA group only 40% rated sessions to be "extremely supportive".

## The Role of Integrin Alpha 7 in Beta-Catenin-Induced Liver Regeneration After Partial Hepatectomy in Mice

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### Poster Presentation

#### ABSTRACT:

**Background:** The liver has an intrinsic regenerative capacity and this unique characteristic is the science behind living donor liver transplantations. Partial hepatectomy (PH) has been widely used to study liver regeneration. Both Wnt/ $\beta$ -catenin pathway and osteopontin, which is also a Wnt-target gene, play a role in liver regeneration following partial hepatectomy. Furthermore, interaction with integrins such as integrin alpha 7 (ITGA7) is one of the mechanisms through which osteopontin mediates its biological functions which includes proliferation and regeneration. Results from our laboratory suggested that osteopontin plays a role in  $\beta$ -catenin induced liver regeneration at 40 hours after PH.

**Objective:** To determine whether ITGA7 plays a role in  $\beta$ -catenin-induced liver regeneration after PH. **Method:** Liver samples from transgenic mice overexpressing  $\beta$ -catenin (TG mice), wild type (WT) control mice, and  $\beta$ -catenin knock out (KO) mice were used in this study at various time intervals at 6 hours (on day 0) and 40 hours after PH. Tissue samples were graciously provided by Dr. Monga of University of Pittsburgh. ITGA7 protein expression was assessed on these slides by immunohistochemistry techniques. Stained slides were imaged using brightfield microscopy to demonstrate the expression of ITGA7. Images were analyzed using Nikon Element Analysis software.

**Results:** Liver ITGA7 protein increased more in TG mice at both 6 hours and 40 hours after PH than WT control mice but not significantly so. On the contrary, ITGA7 protein increased more in the WT control mice at 40 hours than the  $\beta$ -catenin KO mice after PH but not significantly so.

**Conclusion:** These findings suggest that ITGA7 may not be important in  $\beta$ -catenin-induced liver regeneration after PH in mice. Finally, exploring the  $\beta$ -catenin-induced expression of other integrins will contribute to filling the knowledge gap in the field of liver transplantation and regenerative medicine.

**Key words:** Partial hepatectomy,  $\beta$ -catenin, ITGA7, Regeneration

## **Prevalence and Perceived Risk of E-Cigarette Use Among College Students**

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### **Poster Presentation**

#### **ABSTRACT:**

E-cigarettes, also commonly known as e-cigs, e-hookahs, mods, vape pens, vapes or electronic nicotine delivery systems (ENDS) contain a highly addictive chemical that is found in tobacco plants known as nicotine. According to the World Health Organization, more than 8 million people have died from tobacco use. Nicotine cannot only lead to addiction but has also been proven to harm adolescent brain development that continues into the early to mid-20s. The National College Health Assessment done by the American College Health Association found that in 2018, 9% of college students nationwide said that they had used an e-cigarette within the last 30 days.

Here at SRU, officials have taken note of the increase in the use of e-cigarettes on campus and have updated the campus-wide smoking policy to include e-cigarettes and vaping. While there have been recent studies done at SRU, our study differs by aiming to research the student's perceived risks of e-cigarettes. To conduct our research on college student's knowledge of the effects of e-cigarettes, surveys will be sent out to all current Slippery Rock University students. These surveys will primarily ask individuals questions relating to the general information and risks of e-cigarettes and demographic questions to better understand the diversity amongst the participants. After students complete the initial survey, an informational packet regarding the health effects of e-cigarette use will be sent out and participants will be asked to complete a follow-up survey to examine any possible change in the number of individuals who smoke e-cigarettes and if the informational handout has influenced them in any way.

# RECREATIONAL THERAPY

## **Comparative Effectiveness of Canine or Equine-Assisted Therapy for Residents with Dementia**

Megan Hutchman, Elizabeth Kemeny, Ph.D., CTRS, Deborah Hutchins, Ed.D., CTRS, Courtney Gramlich, CTRS, Riley Carsey, Emily Jones, Hope Gettemy, Deborah Walton

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### **Poster Presentation**

#### **ABSTRACT:**

Considered a pandemic impacting 3.65 million people, 14.7% of individuals over 70 have dementia in the United States (Hurd, Martarell, Delavande, Mullen & Langa, 2013). Older adults with dementia may manifest symptoms such as apathy, withdrawal, and aggressive actions (NIA, 2019). Even surrounded by people in LTC, residents with dementia may lack social engagement. Non-pharmacologic approaches are promising (Brodaty & Arasaratnam, 2012) and are reflected in the newer CMS F-tag guidelines (CMS, 2017), but there remains a gap in research about the most effective approaches for LTC residents. Limited research exists on animal-assisted interventions (AAI) as a non-pharmacological approach to increase engagement in people with dementia (Friedman, Thomas & Chung, 2015; Huff-Mercer, 2015) and no known research compares equine- and canine-assisted therapy protocols. This study employed a within-subject alternating-treatments design for three single subjects. Completing the similar tasks of grooming, walking, and interaction, the independent variables are two conditions: 1) Condition A: Equine-assisted activity 2) Condition B: Canine-assisted activity. Using the Dementia Interview Rating (Strauss & Sperry, 2002), apathy was measured before and after each phase. During each session, three outcomes were measured: 1) Engagement in Preferred Activities Scale (Nelson et al., 2014) was used to measure the level of engagement in the interaction; 2) Heart rate variability, a measure of coherence, was measured using the Emwave pro (Heart Math Institute, 2018), and 3) targeted observed social responsiveness (initiation, verbal response, non-verbal response, motor response to one-step instructions) using a smart tablet application. Preliminary results suggest past experience/preference impact the individual client's response to differing protocols. Effective non-pharmacological interventions for older adults with dementia are an essential alternative to current practice.

# SAFETY MANAGEMENT

## **Safety in the Steel Industry**

Nicholas Ravotti, Derek Szymkowski, Damon Morris, Jake Jordan, Alina Schlichtkrull, Amber Wharrey, Cassidy Thornton, Devin Sims, Elliot Peterman, Jake Baker, Jason Chioda, Jordan Higgs, Nick Hurley

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### **Oral Presentation**

#### **ABSTRACT:**

The steel industry is one of America's largest and oldest industries, and according to a study from the American Iron and Steel Institute, has accounted for over \$520 billion in economic output in 2017. However, steel manufacturing is an incredibly dangerous job that exposes workers to a number of potential hazards. The risks of steel manufacturing depend on the specific work that a steel worker carries out, but common examples of risks that workers may face are burns, struck-by hazards, crushing hazards, heat stress, chemical exposures, hearing loss, musculoskeletal disorders, and more. These risks have resulted in 18 fatalities and 4.6 recordable injuries and illness cases per 100 full-time workers in 2018 (Bureau of Labor Statistics, 2018.). The purpose of this research project was to identify hazards that could harm the workers at a local steel manufacturing plant and to provide recommendations to improve the safety of the workers. The research team visited the plant three separate times in order to identify potential hazards. The identified hazards were analyzed by the research team, and they were then compared to the hazards that appear on OSHA's annual "Top 10 Most Frequently Cited Standards" list. After analyzing the hazards, the research team developed and helped the facility's management implement viable solutions that will help protect the workers of the steel manufacturer from the identified hazards. These solutions begin at the top of hierarchy of controls with the elimination of hazards, followed by engineering controls, then administrative controls, and finally personal protective equipment recommendations. One of the tools that the research team used to analyze the hazards of the facility was OSHA's Voluntary Protection Program (VPP) Site-Based Participation Evaluation Report.

SECONDARY EDUCATION /  
FOUNDATIONS OF  
EDUCATION

## **Mathematical Mindsets of Prospective Middle School Teachers**

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### **Poster Presentation**

#### **ABSTRACT:**

It is widely accepted that beliefs play an important role in teaching and learning (e.g. Ambrose, 2004; Pajares, 1992). In recent years, learners' beliefs regarding personal attributes have surfaced as influential – and sometimes detrimental – pieces of the learning process. These beliefs about personal attributes are generally known as mindset. In particular to these beliefs, the idea that one is either born a 'math person' or not forms the notion of a fixed mathematical mindset. On the other hand, the notion that an individual's mathematical ability is something that can be developed through perseverance and hard work forms the notion of a growth mindset. Although mathematical mindsets are fairly well-defined in the research base (Boaler, 2016), measuring those mindsets has been more problematic. A prevailing issue rests in the fact that the bulk of data collected on mindset identification has come from self-reporting surveys (e.g. Blackwell, Trzesniewski, & Dweck, 2007; Dweck, 2006; Dweck, 2012).

This project will report research data in an attempt to provide preliminary insights related to the relationship between espoused and enacted mathematical mindsets of prospective middle school teachers. Previous data collected by the faculty sponsors hold that prospective teachers tend to self-identify as having a growth mindset even when their actions may suggest otherwise. In response to these findings, this project utilizes a self-reporting protocol and observation protocol that have been created to distinguish fixed and growth mindsets in an effort to provide further insights related to the relationship of the espoused and enacted mindsets of future middle school teachers.

# SPECIAL EDUCATION

## The Needs of the Dominican Republic: From Water to Education

Katlyn Allison, Nicole Auen

Faculty Sponsor: Dr. Jeremy Lynch

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### Oral Presentation

#### ABSTRACT:

Roughly 1,565,000 citizens of the Dominican Republic do not have access to clean water (WHO/UNICEF, 2015). Water can be infected with microbes and bacteria in numerous ways, from improper methods of disposing human waste to natural disasters, which can make humans ill when consumed. In fact, 80% of illnesses in developing countries are due to the lack of water purification (UN, 2003). There have been 21,432 reported cases of Cholera in the Dominican Republic since 2010. The solution to this problem is education—how to clean and purify the water (Kramer, 2012). One of the cheapest and most effective methods of purifying water is with ceramic water filters. Each filter costs \$50 and lasts 6-10 years for a family of 5.

The first week of travel, Ms. Auen will be visiting schools and communities to teach how to purify water with ceramic water filters. She will be conducting science lessons with microscopes to examine the bacterium that is in the water and explain how it is making them ill. She will also participate with the construction team laying concrete floors.

The second week of travel, Ms. Allison will be entering schools to teach children math games, take part in cultural exchanges of photographs and letters, as well as further educate and distribute water filters for classrooms to use when necessary. In addition, she will be donating collected schools supplies for the children's everyday use of learning.

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## **How SAT Scores Can Predict Performance on COE Basic Skills Testing**

Emily Luther, Jenna Simpson

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### **Oral Presentation**

#### **ABSTRACT:**

This research project was conducted to inform education majors on the relationship between SAT scores and Basic Skills Testing, specifically the Core Academic Skills for Educators test (CORE), with the aim to work towards solutions that allow teacher candidates to be prepared to meet the fundamental requirements for PA State Teacher Certification. In order to be exempt from taking the math CORE test, students must have earned an SAT score of 500 in math. For those who are not exempt from the CORE, our data show that students who scored 490 or lower on the math SAT are statistically significantly at-risk for failing the math portion of the CORE test. A linear regression test was used to calculate the relationship between SAT math performance and CORE math performance. For this test, SAT math performance was the independent variable and CORE math performance was the dependent variable. Therefore, there is significant evidence of a need for teacher candidates to be informed of these requirements early on, along with providing them academic resources to help them succeed. Action can be taken by initiating peer mentorship in FYRST Seminars. Leading upperclassmen who are familiar with basic skill requirements can give focused presentations and comprehensive information while offering support for students who demonstrate non-proficiency in testing.

## **Educators' Perceptions of the Roles and Responsibilities of Instructional Coaches: A Qualitative Study**

Michele Mrozek

Faculty Sponsors: Dr. Richael Barger-Anderson, Dr. Toni Mild

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### **Oral Presentation**

#### **ABSTRACT:**

Instructional coaching has been in existence in schools since the early 1980s and focused on reading skills (Joyce & Showers, 1981). Over time, the focus expanded to include other disciplines, but there is limited information regarding the roles and responsibilities of instructional coaching in the field of special education. The purpose of this qualitative case study is to examine the educators' perceptions of the roles and responsibilities of instructional coaches (Yin, 2014). Additionally, the study explores the challenges encountered by administrators and educators as they implement the roles and responsibilities of instructional coaches. Participants are two instructional coaches, two school-based administrators, and two general educators from an urban and a suburban high school. The data collection tool is an interview protocol. The protocol includes questions about the roles and responsibilities of instructional coaches and the challenges surrounding the implementation of the roles and responsibilities of instructional coaching. The researcher collected the data from one-on-one interviews with each of the participants and transcribed the interviews verbatim. Data were coded and analyzed using a constant comparison method (Corbin & Strauss, 2015). Findings and conclusions are pending until data analysis is complete. Currently, the findings seem consistent with the literature that school-based administrators, general educators, and special educators have different perceptions of an instructional coach's roles and responsibilities. However, administrators and educators benefit from the support provided by instructional coaches.

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## **Understanding the Impact of International Travel on Pre-Service Teachers**

Colleen Sodano

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### **Oral Presentation**

#### **ABSTRACT:**

Research supports the idea that travel, especially abroad, can be influential in the broadening of an individual's personal and professional perspectives. The shift and change in perspectives have shown to be especially important for pre-service teachers in their ability to address diversity in the classroom (Asteskan, 2016; Constantiou, 2015; Egeland, 2016; Francis, 2015; Marcus & Moss, 2015; Salmona, Partlo, Kacynski, & Leonard, 2015). Our goal is to understand how international travel and education experiences can change pre-service teachers personal and professional identity and cultural understanding. We modeled the current study based on the theoretical framework developed by Constantiou (2015), which encompasses four themes: (1) teacher identity, (2) cultural competencies, (3) attitudes and behaviors, and (4) empowerment and confidence boosting. To execute this study, we adopted the City as Text © model developed by Braid and Long (2000). City as Text © is a program where students immerse themselves in communities exploring the culture and geography of immediate neighborhoods. Students are challenged to be sensitive and reflect about the human experience in the local environment. Students explore the local communities observing the architecture, the people, and daily life activity by interacting with local peoples. For this study, we are expanding this framework to include teaching experiences within local school systems. Data analysis will be conducted using procedures for qualitative content analysis described by Schrier (2012) to apply the theoretical framework developed by Constantiou (2015) and the City as Text © model (Braid & Long, 2000) to the data. We will use the NVivo 12 data analysis software to analyze the data in the following order: (1) decontextualize, (2) recontextualize, (3) categorize, and (4) compile. Data collection will begin during the March 2020 Spring Break Programs; IRB approval is pending for this study.

# THEATRE

## **Brookens-Bates Summer Theatre Program Research Project**

Naomi Bates

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### **Oral Presentation**

#### **ABSTRACT:**

Throughout the course of our project, we researched the process, possibilities and best practices related to the creation of a potential, annual summer theatre academy held on the SRU campus. Our primary areas of research included regional and national program comparison; programmatic mission/vision/values/goals; programmatic format & planning; budgeting; strategic planning & program evaluation; marketing; personnel training & management. Our research activities included creation, administration & analysis of survey targeted to regional parents/guardians and high school students; discussions with multiple SRU offices in order to determine process for program implementation; discussion with Forge Summer Dance Intensive Director, Lindsay Viatori, to discuss process/feedback related to this program as well as potential collaborative opportunities; research related to topics outlined above, utilizing the Americans for the Arts "National Arts Administration and Policy Publications Database" and "National Arts Marketing Project" resource library, as well as additional sources. We met regularly throughout the summer to discuss our process, outline tasks and timelines, analyze findings, attend meetings with SRU faculty and staff, and craft specific recommendations. We compiled our research findings and recommendations into a formal program proposal for the implementation of a potential summer theatre program titled Rock Summer Theatre Academy. Our proposal also includes recommendations regarding potential future program expansion in the form of a summer theatrical production. Our program proposal includes both a narrative outline of recommendations by topic, as well as a comprehensive resource library. Additionally, Miss Bates created a detailed Power Point presentation of findings and recommendations to use in our presentation to the SRU Theatre Department faculty.

CLASSROOM-BASED  
RESEARCH, SCHOLARSHIP,  
AND CREATIVE ACTIVITY

# ART

## **Kandinsky Master Copy by Basic Painting HIP-C**

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### **Poster Presentation**

#### **ABSTRACT:**

Artist, Wassily Kandinsky, was born on December 16th in 1866, in Moscow, Russia. He graduated from the Grekov Odessa School of Art and went on to enroll at the University of Moscow to study law and economics. Kandinsky began painting his now famous artworks around the age of thirty, exploring the connection between music and art through the use of colors. Assigning a color to a specific instrument, he would paint while listening to music, creating works that directly expressed the music he was hearing and the emotions that the sounds evoked. Because of this, there was an energy to most of Kandinsky's works that was born from this direct connection between art and music.

To capture the energy, Basic Painting ART 106 students recreated his expressive brushstrokes and lines that traveled throughout his Composition IIV, 1913. This was a challenge. Each student was assigned a part of the painting to complete and then the canvas papers were adhered onto a large stretch of canvas. The students communicated throughout the creation of their individual works with their 'neighbors' to assure all the brushstrokes and lines matched up. This communication was essential to the finished work which was gifted to Swope Music Hall, where it will be permanently displayed.

It is our vision, to invite a select number of music students to improvise, live, to the painting while it is on display. This way, the artists, musicians and audience alike, may experience the movement and sound perceived in Kandinsky's work with this visual and auditory collaborative connection.

## **The Art of Personality**

Julianne Meskanick, Daniel Clowes, Michelle Concannon, Jeffery Gun, Eden McAdoo, Jordan McAdoo, Avery Oates, Destiny Blackwell, Samuel Firkaly, Sadie McNulty, Gregory Jones

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### **Exhibit**

#### **ABSTRACT:**

Art and psychology students from Slippery Rock University came together for a successful collaboration and learning exchange. This interdisciplinary project focused on the creation of diverse representations of the Big-Five Personality Traits: agreeableness, conscientiousness, extroversion, neuroticism, and openness to experience. The Slippery Rock Printmaking and Psychology Project challenged students to bring two diverse subjects together. To start the project, psychology students shared their research on personality. Their research served as an inspiration for the art students. As art students, we created a visual interpretation of the research. Then, we shared the ideas and process with the psychology students. We received feedback and bounced our ideas off each-other. In order for both groups of students to establish a common understanding of respective disciplines, we exchanged insight and shared jargon. During the process, the psychology students had a chance to learn and experiment with printmaking techniques. The result of this collaborative effort was a series of five prints created by each student representing the Big-Five Personality Traits. When students are brought together in interdisciplinary projects, everyone involved gains new experience and growth. By infusing art and science, this collaboration allowed students from two colleges to connect, share and learn about new subject matter, outside of their studies. Reciprocal learning encourages participants to appreciate new perspectives contribute their own expertise to create a rich experience for everyone. This collaborative project provided an opportunity to expand the students' awareness, grow communication skills, and find inspiration in art and science topics. The end result was a series of intentional and vibrant prints, inspired by this immersive collaboration.

## **Natural Dyes in My Kitchen and Backyard**

Alexis Walker

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### **Exhibit**

#### **ABSTRACT:**

From the skins of an avocado, the root of a madder plant or anything in between, a shade of color can be produced. Natural dyes are pigments that are obtained from plants, roots, fruits and more. This technique of using natural dyes has been used since ancient times and is still available to us today but not everybody is aware of it. My research of the natural dyes made it very apparent to me that I can make dyes with many plants available to me in my backyard or kitchen. My experimentation conducted in the Fiber Art Studio resulted in a broad range of colors created.

# COMMUNICATION

## **Public Relations Case Study: Community Relations Throughout the #AerieREAL Campaign**

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### **Oral Presentation**

#### **ABSTRACT:**

This project explores the bold undertakings of Aerie, a subsidiary brand of American Eagle, through its #AerieREAL campaign. The project explores why and how well Aerie focused on body positivity from a marketing and public relations standpoint. Using public relations research methods and terminology, this project assesses the effectiveness of Aerie's campaign within an immediate and long-term time frame.

Research was conducted to understand the underlying campaign messages and motives. News articles; company materials; including ads, press releases and social media content; and outside commentary on well-known, reputable blogs were heavily relied on to fully explore this campaign. These sources provide a well-rounded view of Aerie's campaign at all stages of its progress. This allowed for a complete review of the campaign by itself and in comparison to a similar brand, Victoria's Secret.

The ethics of Aerie were assessed using the Public Relations Society of America Code of Ethics. This project pinpoints Aerie's corresponding viewpoints in terms of advocacy, honesty, expertise, independence, loyalty and fairness.

The research compiled in this project proves that Aerie's #AerieREAL campaign uses a variety of tactics centered around the well-being of its stakeholders. All in all, Aerie brought a sensitive topic to light among the company's known following and became a standard bearer in the intimate apparel sector. Aerie did an excellent job maintaining an ethical and authentic image throughout this on-going campaign.

## **Public Relations Case Study: Consumer PR and Integrated Marketing Communication within the American Greetings Corporation**

Alisen Hazeltine, Bailey White, Beatrice Egyed

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### **Poster Presentation**

#### **ABSTRACT:**

This project analyzes the consumer public relations and integrated marketing communication aspects of American Greetings' "World's Toughest Job" campaign. This paper uses communication theories and practices to evaluate the effectiveness of this campaign with suggestions as to how other companies can learn from its success. In addition, included is a comparison between the Mother's Day campaigns of American Greetings and Teleflora.

This case analysis research was conducted using sources from American Greetings' and Teleflora's websites, as well as press materials covering the logistics of each campaign and publications describing best practices within the field of PR. This paper focuses on the different communication tactics and strategies that both companies used and how they affected the success of each campaign.

This study argues that American Greetings executed its campaign more effectively than Teleflora through the use of timely, authentic and shareable tactics. Whereas, Teleflora was more dependent upon paid tactics with a humorous approach which did not gain nearly as much consumer engagement.

The ethics of American Greetings were assessed based on its inclusion of the values of advocacy, honesty, expertise, independence, loyalty and fairness in its campaign. These six core values are credited to the Public Relations Society of America Code of Ethics.

This campaign was one that followed best practices and should be referenced by other companies as best practices. The success of the campaign can be credited to its utilization of shared media tactics which consequently led to positive earned media coverage.

## **Public Relations Case Study: United Airlines' Passenger Removal: What Not to Do in a Crisis Situation**

Gabrielle Hodes, Nicole Brungard, Jenée Ewing

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### **Oral Presentation**

#### **ABSTRACT:**

This paper examines the United Airlines' Flight 3411 crisis response and the strategies implemented following the event. This paper used public relations practices to examine the strengths and weaknesses of United Airlines' crisis response strategy. This paper will provide an analysis of the strategies and if they were appropriate for the situation. There will also be a comparison of United's crisis response and American Airlines' crisis response to a similar situation.

This research was conducted using United Airlines' and American airlines company documents from 2017. Some responses are no longer on United's Newsroom; therefore news articles were used to provide insight into the crisis and for an established timeline of events. These resources provided this paper with materials to determine public relations practices and public responses. The Public Relations Society of America's Code of Ethics was also used to assess how ethical United's responses were.

This research shows that even though United Airlines ultimately responded appropriately, the initial responses were too damaging to overcome. The responses left a mark on United Airlines' reputation, even after rectifying the situation. This research proves that in order to resolve a crisis situation, the proper public relations practices need to be implemented immediately.

## **Public Relations Case Study: Corporate Social Responsibility of the Aerie Real Campaign**

Alexis Miller, Heidi Blatz

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### **Poster Presentation**

#### **ABSTRACT:**

#AerieReal is a corporate social responsibility campaign targeted toward women of all backgrounds to change the perception of how the female population is portrayed in the media. Aerie used the empowering strategy of corporate social responsibility to show its commitment to the community and the well-being of women. Aerie pinpointed a major issue woman face and by doing so, the company initiated the goal of ensuring that all women feel welcomed and included in the Aerie brand. Aerie took a risk in 2014 by stepping out of social norms to make a statement that all women should feel beautiful no matter the race, size, illness, or disability. The ongoing and always evolving campaign pushed others to aide in the female empowerment movement. Research proved that the campaign was incredibly successful in promoting brand awareness, maintaining corporate values and creating a future of female body positivity. The following will further analyze the success and effectiveness of the corporate social responsibility campaign by understanding the background of the organization, the strategic approach of the campaign, an assessment of the results, and an evaluation of the company's ethical position after the campaign.

# CRIMINOLOGY AND

# CRIMINAL JUSTICE

## **The Application of Deontological and Utilitarian Ethics to the Release of Elderly Inmates**

Alicia Gonzales

Faculty Sponsor: Dr. David Champion

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**Oral Presentation**

### ABSTRACT:

This project explores the application of ethical schools of thought to a proposed issue in the criminal justice system, the early release of older inmates from being incarcerated. The traditional approach to justice approaches this topic with a deontological and punitive viewpoint. The deontological approach emphasizes retribution and deterrence and is firmly rooted in criminal law. Offenders should serve a sentence that is appropriate and fitting to their crime in order to maintain social harmony and to be held accountable. This school of thought has been conventionally applied to all subtypes of offenders, but many scholars are now stressing the differences between demographics. The elderly population is more vulnerable to victimization in prison and has a low recidivism and low-risk rate. There is also a cost factor in continuing their incarceration due to physical and mental ailments not experienced by younger offenders. An opposing utilitarian view to early release has begun to examine this issue based on the consequences that would maximize happiness for everyone.

## **The Disagreement Between Police Misconduct Accountability and Peacemaking Theory**

Malachiah Koehler

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### **Oral Presentation**

#### **ABSTRACT:**

Social justice movements focusing on police conduct have increased in the United States over the past decades. Trust between law enforcement and communities continuously dwindles, decreasing the legitimacy of the institution. Ensuring police are appropriately held accountable for their actions will assist in restoring damaged community relations and set precedents of unacceptable behaviors. This paper investigates the disconnect between current police misconduct accountability practices and peacemaking theory. The definition, themes, and archetypes of peacemaking theory are given in addition to a history of its application in policing. Civilian review boards (CRBs), disciplinary actions, and police protections are described and further discussed as to how they disagree with peacemaking by promoting further harm to society. Lastly, restorative practices, rooted in peacemaking are defined and evaluated as additions and potential alternatives to accountability measures.

# DANCE

## **Moving Towards Positive Mental Health with Dance**

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### **Oral Presentation**

#### **ABSTRACT:**

Dance and public health are two terms not often thought of as having something in common with each other. However, when it comes to the concern for mental health disorders, such as depression, both fields have something beneficial to offer. Both areas, dance and public health, work together to serve the connections between the mind, body, and community. Declining mental health has become a growing public health concern in the recent years, and many fields are looking for ways to remedy this increasing issue. A field that offers new and alternative methods to treating mental illness is Dance Movement Therapy (DMT). DMT is defined as “the psychotherapeutic use of movement as a process which furthers the emotional, cognitive, social, and physical integration of the individual” (Goodill 16). I argue that Dance Movement Therapy is a treatment strategy that can positively influence the connection between mind and body, serve as an aid or alternative to medications, and assist in the rehabilitation process of those with a mental disorder, such as depression. The research method used for this project included a literary analysis of works from authors in both public health and DMT fields such as Bonnie Meekums and Bruce Levin.

## **The Multiple Benefits of Dance Movement Therapy in Children with Down Syndrome**

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### **Oral Presentation**

#### **ABSTRACT:**

Dance Movement Therapy (DMT) uses movement and dance in a psychotherapeutic way to support and increase emotional, motor, and intellectual functioning of the human body (Kourkouta 230). By participating in DMT, children will gain a deeper understanding of self-awareness through a meditative process that involves motion. Additionally, Dance Movement Therapy will provide an increase in the quality of life for children with Down syndrome by increasing their physical, cognitive, and social skills; thus, generating more inclusivity and acceptance for the child's future. Studies suggest that DMT can improve a child's functional levels as well as self-esteem, which will then help reduce their stress levels and create more independence. Dance is a form of physical activity that is used to increase both the emotional, social, cognitive, and physical well-being and quality of life for a child with Down syndrome. Chemically produced medical drugs are being prescribed before other non-medicated treatments are even tried. DMT is a holistic treatment and allows children to creatively express themselves. As a holistic treatment, DMT should be used as a treatment option for children along with or instead of all the prescriptions that are being used. DMT can be used as a therapeutic tool to increase the quality of life in children and adolescents with Down syndrome (Nelson 77). This research was conducted using scholarly and peer reviewed journals, and government websites.

## **Making Martha Graham Human: Exploring Martha Graham's Aesthetic Shift Influenced by Erick Hawkins**

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### **Oral Presentation**

#### **ABSTRACT:**

Martha Graham, one of the most influential choreographers of the 20th century, significantly revolutionized the genre of American modern dance. She developed her technique, which emphasized the use of contraction and release, shift of weight, and spiral around the body's axis, as she built her substantial body of repertory consisting of 181 dances. Interestingly, Graham's repertory underwent a radical aesthetic shift between the 1920s and the 1940s. During this time, her choreography became less stark, less abstract, and less minimalistic, and more theatrical and narrative-driven with extensive movement vocabularies. Based on my research of dance critiques, scholarly articles, and biographies, I consider the inclusion of male dancers in her company the cause of Graham's aesthetic shift. Specifically, when Erick Hawkins became the first male dancer in Graham's company in 1938, his masculinity influenced her aesthetic as she choreographed dances featuring him in leading roles. Considering that Graham and Hawkins had a romantic relationship for several years, she choreographed dances which dealt with love, sex, and the human psyche during this time in her life. Hence, the presence of male dancers in her repertory allowed her to portray characters and depict stories involving these themes. I argue that Martha Graham's inclusion of men in her company, most notably Erick Hawkins, influenced the shift in her choreographic aesthetic from stark and minimalistic to narrative-driven and theatrical. I utilize works by authors like Mark Franko, Agnes de Mille, Anna Kisselgoff, and Marcia B. Siegel to supplement my research, and I will present this research via audio-visual materials.

## **The Difficult Art of Fusion in Dance: An Examination of Wang-Ramirez's Works and Creative Processes**

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### **Oral Presentation**

#### **ABSTRACT:**

If you closely examine hip hop and contemporary dance, it is clear that they are two very different movement genres. Hip hop was discovered in the streets of New York in the 1970's, while contemporary dance is seen as a higher art form developed when Isadora Duncan broke away from classical ballet in the late 1800's. Despite their different historical backgrounds, many dance artists have been intrigued by bringing these two genres together. It is interesting to see how they create a space that allows for these two idioms to converse. In this current research, I will specifically and closely examine the works of Wang-Ramirez. Their choreographic works are unique due to each of their professional and personal backgrounds. While Wang is of German and Korean cultural background, Ramirez is of French and Spanish cultural background. Wang is versed in hip hop, ballet, contemporary, and martial arts techniques while Ramirez is versed in aerial work and hip hop. After an initial analysis of their works, I argue that Ramirez and Wang create a third language that consolidates hip hop and contemporary forms of dance. This new language acknowledges their two distinct vocabularies, creative processes, cultures, and aesthetics.

## **Dancing Your Way into A Foreign Culture: An Effective Method to Overcome Xenophobia**

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### **Oral Presentation**

#### **ABSTRACT:**

Around the world, cultures and societies practice dances that relate directly to their history and socio-political trajectory. When learning a foreign dance specific to a culture, people are immersed in that culture's customs and traditions through visual, auditory, kinesthetic, and tactile stimulation. Dance is a means of expression of a culture and reflects its values, aesthetics and beliefs. Some examples would include: capoeira from Brazil, tango from Argentina, and hula from Hawaii. Dance has been used as an effective means of educating individuals about the history and customs of an unfamiliar culture. However, some individuals have an intense fear of people from cultures different from their own; these individuals suffer from a mental health illness known as xenophobia. Although investigation of the topic is minimal, I argue that learning dances from an unfamiliar culture would serve as a treatment option for people who suffer from xenophobia. I will present and elaborate on theories that will help identify and understand xenophobia treatment such as multidisciplinary exposure, dance therapy, and kinesthetic empathy.

Keywords: Xenophobia, dance, treatment, kinesthetic empathy, therapy

## **Dancing Through Tree Trunks, Sand Dunes and Ponds: An Examination of Nature Portrayed in Dance**

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### **Oral Presentation**

#### **ABSTRACT:**

Throughout the history of dance, choreographers have used different methods and creative processes to express their perception of nature, and each of these methods create a different response in their audiences. In my research paper, I examine the works of various choreographers and their different approaches to nature. I examine Stephan Koplowitz “Liquid Landscapes” which takes place in the outdoors rather than on a stage. Additionally, I study Sankai Juku’s inclusion of water and sand elements in their piece “Unetsu” choreographed by 天児牛大 Amagatsu Ushio. After observing and analyzing these pieces, I argue that these choreographers’ final choreographic display are substantially different and provide such contrasting effects even though they all make direct references to nature.

## Objectification of the Female Body in Jazz Dance

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### Oral Presentation

#### ABSTRACT:

Jazz dance artists in the 20th century who dominated the jazz dance community were prominently male. A bias towards men was created within this historical time period and is examined in books such as *Jazz Dance: A History of Roots and Branches* by Wendy Oliver and Lindsay Guarino. This bias led to frequent objectification of women in jazz dance. Famous choreographer and director, Bob Fosse, often instructed his female dancers to be seductive and sexually inviting. Although there were many male choreographers, such as Fosse, the movement vocabulary created was often feminine. While there were many strong female dancers, there was still an unsaid pattern of females yielding to their male partners. I further explore this idea through the relationship between Fosse and Gwen Verdon. Josephine Baker, who rooted her practice in jazz and African aesthetics, is another female jazz dancer that was ridiculed for objectifying her own body. I question if it is socially accepted for a woman to objectify her own body through choreography but not applauded for a man to do the same. Jazz dance is not alone in the objectification theory. George Balanchine was heavily influenced by jazz aesthetics which translated into many of his balletic works. Elements in his works are found in the displacement of the hips, flexed wrists, and attacking the beat. Other styles, such as modern dance and contact improvisation, challenge the concept of objectification of women by creating an environment based on equality. Although female objectification and male dominance is clearly present in jazz dance, it may also be practiced in other disciplines of dance.

## **Abstract Versus Literal, Motion Versus Emotion: An Examination of Movement Invention and Creativity in the Choreographic Process**

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### **Oral Presentation**

#### **ABSTRACT:**

Dance, as many other art forms, draws from many creative methodologies. There are infinite strategies to develop movement vocabulary and assemble choreographic works. Different styles and aesthetics in dance are preferred by different audiences and practiced by different artists. Through my research, I have examined two different methodologies behind movement invention. I argue that dance as an art form may be shaped by the intention behind the movement. A dance can be emotionally, or movement driven. Though the choreographic process of these different creative approaches can be vastly different, they will each hold great value and appreciation by the audience. A resulting choreographic product may be successful and aesthetically pleasing to audiences due to the intent behind the creative process.

# ENGLISH

## **Autonomous Trucks and Job Loss**

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### **Oral Presentation**

#### **ABSTRACT:**

The autonomous vehicle industry is on the verge of introducing safer, less wreck-prone vehicles to the marketplace. However, autonomous cars will displace more than just manual vehicles. There's considerable debate about to what extent autonomous trucking, specifically, would be more efficient than human drivers, and also to what extent it would lead to mass unemployment. In this presentation, I will summarize the difficulties autonomous vehicles face when tackling the 'last-mile problem,' leaning heavily on my experience as a 'parts runner.' I will also present and interrogate the research of Steve Viscelli, a sociologist at the University of Pennsylvania whose work on autonomy-driven job loss in the trucking sector was the focus of my final research project in my "University Seminar: Driverless Cars" course. In sum, the potential impacts of autonomous trucks on the human labor market needs to be reevaluated and prioritized when discussing any potential benefits that autonomy may have for the trucking sector.

## **Adjusting Focus: Why Secondary Teachers Should Embrace Video Production within English and Journalism Education**

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### **Oral Presentation**

#### **ABSTRACT:**

As today's media-driven culture continues to impact today's high school classrooms, teachers are increasingly incorporating digital-based assessments into classroom curriculum. In high school English, journalism, and media arts classes, video production is often one of these incorporated modes. When incorporated effectively, video production proves to reinforce writing instruction or, in some cases, serve as a replacement to traditional writing assignments, such as the five-paragraph essay or the research paper. The presence of video production in today's high school classrooms varies depending on content and subject. This research includes interviews with four different teachers from western Pennsylvania, examples of the presence of video production within writing instruction are revealed within three different curricular environments: literature, journalism (both print and broadcast), and media arts/digital media. While the amount of writing-based and video-based assessments varies in each environment, each interviewed teacher requires students to incorporate pre-planning, script writing, storyboarding, and/or interviewing into any video production assignment, which largely resembles the planning stages students must take for a successful written assessment. Per the teachers' first-hand accounts, video production serves as a form of assessment that utilizes the research, planning, composition, and revision stages of writing while introducing multimodal into the secondary classroom.

# EXERCISE AND REHABILITATIVE SCIENCES

## **A Mixed Methods Approach to Understanding the Meaningfulness of Occupations and Their Impact on Opioid Addiction**

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### **Poster Presentation**

#### **ABSTRACT:**

**Objective:** The purpose of this study was to investigate and report the role of occupations and their meaningfulness in the recovery of individuals who are currently in recovery from opioid recovery.

**Methods:** Through a mixed-methods approach, participants (n=54) completed a questionnaire and participated in a focus group interview (n=8). The questionnaire consisted of 6 sections; demographics, substance use/recovery, personal dynamics, activities chart, attributes, and agreeable statements. The interviews utilized a semi-structured interview guide to explore aspects related to each participant's recovery. Descriptive statistics were used to analyze questionnaire results. Qualitative data were analyzed for themes.

**Results:** Three qualitative themes emerged (1) influences leading to recovery, (2) barriers to successful recovery, and (3) behaviors associated with recovery. The survey indicated the three most common positive attributes to recovery were family, medication, and counseling while friends, finances, and stress were the most common negative attributes related to their recovery. The majority of participants indicated that they were positive and satisfied about their recovery process. Descriptive statistics were calculated for level of frequency and meaningfulness related to activities of daily living.

**Conclusion:** Overall, participants described their recovery as multidimensional in that each had various influences and factors leading to the success and satisfaction that they indicated. The study identifies the need for schedule and routine as well as meaningful occupation to one's life upon recovery. The findings of this study can help to guide programming for Occupational Therapist's implement with individuals in recovery from opioid addiction.

## **Actual and Predicted VO<sub>2</sub> Max With and Without the Consumption of Caffeine**

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### **Oral Presentation**

#### **ABSTRACT:**

One of the most common strategies athletes use to improve performance is the consumption of caffeine. Several studies have researched the effects of caffeine on predicted VO<sub>2</sub> max of a cycle ergometer, but little research has evaluated the effects of caffeine using treadmill aerobic fitness tests. The aim of this study was to determine if the consumption of caffeine one-hour prior to exercise would increase the actual and predicted VO<sub>2</sub> max when compared to the actual and predicted VO<sub>2</sub> max without caffeine consumption. In a single-blind, randomized study design, two females and two males completed two Bruce maximal treadmill tests and two Ebbeling Single-Stage submaximal treadmill tests. One hour prior to exercise, participants consumed drinks of 200mg of caffeine or a placebo. No significant difference was found between the actual VO<sub>2</sub> max with caffeine consumption and with placebo consumption when performing the Bruce maximal treadmill protocol ( $p>0.05$ ). No significant difference was found between the predicted VO<sub>2</sub> max with caffeine consumption and with placebo consumption when performing the Ebbeling submaximal treadmill protocol ( $p>0.05$ ). A significant difference was found between the VO<sub>2</sub> max when comparing the Bruce Maximal treadmill test and the Ebbeling submaximal treadmill ( $p<0.05$ ). The present study shows that caffeine consumption one hour prior to exercise will not result in a significant increase in aerobic performance.

# GEOGRAPHY, GEOLOGY, AND THE ENVIRONMENT

## **Observational Analysis of Alterations in “Wiggleness” of Jet Stream Flow Over the Past 50 Years**

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### **Poster Presentation**

#### **ABSTRACT:**

Global temperature increases began in the mid-1970s and have steadily increased over time; however, the Arctic region has been warming at a faster rate, due to multiple factors including melting snow and decreasing ice surface albedo. This differential warming has potential implications on the strength and direction of the Northern Hemisphere polar jet stream, because the jet stream responds to the strong temperature gradient occurring between equatorial and polar regions. Increased warming of the Arctic causes this temperature gradient to weaken, which causes the jet stream to respond by becoming weaker and having higher amplitude waves. Evidence of this increased warming altering the jet stream has been linked to an increase in extreme weather events in the mid-latitudes. The GGE HYSPLIT HELPER was used in this study to investigate the strength and variability of the jet stream over North America during the last 50 years in an attempt to observe the possible changes in jet stream behavior. Seven different sites were analyzed along the 45.000° latitude line. This study uses the GGE HYSPLIT HELPER, NOAA Reanalysis Data and a GIS spatial statistics analysis program to determine if the jet stream has 1) slowed down, 2) widened, and 3) increased in its north/south transport.

# HISTORY

## **Special Field Order Number 15: An Analysis of the Order and its Effect on the Freed and Abandoned People of the South**

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### **Poster Presentation**

#### **ABSTRACT:**

Enslaved Africans have a history in the Americas going back to 1619 when the first group of enslaved people arrived in the colonies. Unfortunately, they were not considered people or given right for another 246 years. This meant that racial discrimination became so engrained in society, that many economies developed a dependency on the “peculiar institution”. When the south believed that their livelihood was being threatened, they would rather secede then give up slavery. Even after southern secession, there were arguments about the importance of Abolition and if war was worth it. Politicians questioned what would happen to the millions of newly freed people after emancipation and if they would be able to care for themselves. One of the earliest examples of former enslaved people self-governing on a large scale took place in January of 1865, when General Sherman issued Special Field Order No.15 after much pressure from Congress. This was one of the first attempts at establishing a system of order for the abandoned slaves in the islands of Charleston, South Carolina and along the coast towards Florida. By taking abandoned land in the area and allowing the freed people to establish communities to self-govern, they were able to prove that they were able to function outside of slavery. The order did not last long, but it did leave proof that enslaved people could survive outside of slavery and established the belief in land reparations for former enslaved people and the rumor of “forty acres and a mule”.

## **Pennsylvania During World War II: How Two Cities Helped Achieved Victory**

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### **Poster Presentation**

#### **ABSTRACT:**

Many states added to the success of World War II, but Pennsylvania and two of its greatest cities added contributions unlike any other. Pittsburgh and Philadelphia were once separate cities on different sides of the state, but World War II brought them together in individual ways. Pittsburgh produced steel and Philadelphia added naval production. Each city offered different industrial productions, but World War II brought them together to result in an allied power victory, and some Pennsylvanians reaching the spotlight on the battlefield. Throughout the historical analysis of primary and secondary sources, the success of Pennsylvania is proven from photographs, military archives, and interviews. In conclusion, Philadelphia and Pittsburgh played a significant role in the success of World War II through the support of its citizens, skilled military leaders, and industrial goods.

# HOMELAND AND CORPORATE SECURITY STUDIES

## **Defeating State Supported Terror Organizations**

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### **Poster Presentation**

#### **ABSTRACT:**

For my international poster project I would like to research how state supported terror organizations and their respective countries prepare for large scale attacks and invasions. This research could be beneficial in many ways. One of the ways this could be beneficial is because having a better understanding of how these countries protect the terror organizations that operate within their border could better help government officials and agencies on how to infiltrate these countries. This might give the United States and their allies a better chance to be able to take down the terror organization working from inside the country. This would also give me a better understanding of how these countries are overtaken by the terror organizations. Finally, I would like to take a closer look at how we can go about taking the government back into control, instead of being led by terror organizations so we can try to lessen if not end the global terror crisis.

## 2011 Tōhoku Earthquake and Tsunami

James Galvin

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### Poster Presentation

#### ABSTRACT:

This project seeks to analyze the 2011 Tōhoku earthquake and tsunami and provide a synopsis of the catastrophe. Contemporary emergency management methods will be contrasted with those of Japanese authorities in order to better construct our procedures. Perspective adjustments to existing emergency management frameworks with considerations to this particular event will be offered in order to bolster our disaster remediation capabilities.

Background: At 14:46 Japan Standard Time (JST) on Friday 11 March 2011, an earthquake of 9.1 magnitude took place off the East coast of Japan. After the initial strike, a tsunami harboring waves up to 135 ft. tall traveling at nearly 500 miles per hour (mph) swept over Sendai, Japan. The Japanese Police Agency has reported 15,899 deaths in addition to 6,157 injuries and 2,529 missing persons as result of the natural disaster. As the initial waves had made landfall, the Fukushima Daiichi Nuclear Power Plant was taken offline and left without power. As a result, the plant suffered three level 7 meltdowns according to the International Nuclear Event Scale. The 2011 Tōhoku earthquake was the largest ever recorded in Japan and the fourth largest in recorded history. This disaster is regarded as the costliest in history, resulting in an estimated US\$235 Billion worth of economic losses according to the Bank of Japan.

Methods: Research is to be compiled through web searches of scholarly articles, peer reviewed journals, primary source accounts, and field research reports. Citations will be attributed to the authors of reference texts.

Keywords: Tōhoku, earthquake, tsunami, disaster, catastrophe, recovery, damages, casualties, humanitarian aid, Fukushima, nuclear

## **Emergency Preparedness for Infants and Young Children in Australia**

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### **Poster Presentation**

#### **ABSTRACT:**

Research has been conducted on the impact of emergencies and natural disasters that directly and indirectly impact infants and young children. Infants and young children need specific food and fluids in order to safeguard their weak immune systems that are highly susceptible to many health hazards and concerns. One of the most critical things that make this group so vulnerable is any emergency that results in a lack of clean water is potentially dangerous and even fatal in certain circumstances. For example, infants who are breastfed have a better chance in the event of a disaster compared to those that are given formula. Clean water, electricity, and gas are needed in heating water, being hygienic with food, and having a healthy wash environment. Those are all important factors when it comes to protecting infants and young children. Australian Emergency Preparedness has plans in place for animals in a time of crisis, but they are continually working with Operational Guidance on Infant and Young Child Feeding in Emergencies (OG-IFE) and Infant and Young Child Feeding in Emergency (IYCF-E) to better coordinate a plan to address these specific needs and stipulations for this specific group. Therefore, a fully assessed and planned out guide is being processed and formulated due to numerous requests from organizations that want to keep the youth safe and the lack of attention from Emergency planners in Australia.

## **Emergency Preparedness and Response in Africa**

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### **Poster Presentation**

#### **ABSTRACT:**

Africa is continually faced with challenges including natural and man-made critical events that endanger the surrounding communities, environment, and infrastructure. A majority of consequences, such as death, injury, affected population, and economic loss are caused due to natural disasters. Other events consist of epidemics, flooding, and droughts. Emergency operations have emerged themselves into the oversight of disasters in Africa and how they affect the already fragile economy, poor infrastructure, and poverty. These teams incorporate planning, training, and old tactics into their response to overcome obstacles and learn more about the disasters that occur in Africa. Included in their selection of response to incidents are humanitarian factors. While emergency operations main goal is to focus their effort and support to all parts of the world, Africa's consequences give insight toward to horrible destruction that simply humanitarian aspects and natural disasters can have. Public health is highly involved with the works of emergency response teams because of the starvation, water deprivation, poverty, and food scarcity. Emergency operations are finding the means to reduce risks by creating plans, strengthening warnings, building strengths between health units, and more. Resource allocation is another important factor to bring up due to the fact of continually migrating refugees escaping conflict. There are multiple significant public, private, and non-profit organizations included in the mitigation of Africa's worst disaster areas. Although little is talked about Africa's adversities, it is important to acknowledge the hard work of these emergency services.

## Wuhan Coronavirus Cases

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### Poster Presentation

#### ABSTRACT:

As of January 30, 2020, the first case of person to person transmission of the Wuhan Coronavirus occurred in the United States. This is just one of the thousands of coronavirus case infections since November of 2019. Person to person transmission of the virus remains a substantially low risk according to the CDC, however it is important to understand the reactive nature if the virus becomes a larger priority. The coronavirus is very similar to how the common cold virus interacts with humans, therefore rising much concern for reactive preparations in western civilization. The increasing global spread of the virus has initiated a global health emergency by the World Health Organization (WHO). Spreading is a major concern because of the transmission capabilities of the virus from pets, to people and sustainable environments. Furthermore, the effects of the coronavirus in its host location, Wuhan, China, have proven to be lethal, raising concern for travel to China worldwide and a global prioritization for research on the virus.

Hein, A. (2020, January 30). Person-to-person transmission of coronavirus reported in US, CDC says. Retrieved from <https://www.foxnews.com/health/person-to-person-transmission-coronavirus-reported-in-us-cdc>

2019 Novel Coronavirus (2019-nCoV) in the U.S.

## **Indonesia: Earthquake Ground Zero**

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### **Poster Presentation**

#### **ABSTRACT:**

Indonesia is famous for having terrible earthquakes come through and wreck havoc on their people. Much of the same continued in 2018 with the 7.5 magnitude earthquake and tsunami that ravaged through the central province of Sulawesi. This particular earthquake is just one of several to hit in 2018, occurring on September 28. The focus of the following project is going to be all the people affected, the relief efforts, and why Indonesia is a hot spot for these disasters. The specific focus will be on the Indonesia Disaster Management Agency and how they go about helping these events and the help they receive from other agencies. It is easy to spot Indonesia is in need of assistance, the September 28 earthquake and tsunami killed over 2000 people alone and affected around 1.5 million people. This country is on the edge and its people are displaced, some with no real hope. Around 68,000 houses have been destroyed which is a problem that needs to be resolved. For this project, there will be a study regarding the relief efforts of Indonesia and the timetable of help arriving. It is important for all countries especially one with as many horrific events as Indonesia to have an effective disaster management team and plan. It is vital to have these agencies set up with a plan to know the first step when something bad happens, because a lot of the time starting is the hardest part. Disaster recovery is an important asset for countries to have at their disposal, so this project will look more into it.

## **Disaster Recovery in The Philippines**

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### **Poster Presentation**

#### **ABSTRACT:**

Living on this planet may be a wonderful experience, but it comes with a price. Around the globe, every living being is faced with the wrath of an inevitable occurrence: natural disasters. As humans, we know that stopping a natural disaster is impossible, so we create ways to make the disaster less devastating. This idea is an international one and is used for every natural disaster including the volcanic eruption that happened in the Philippines on January 12th of this year. The volcano has caused problems for many individuals by burying homes in ash and causing nearby residents to be displaced. Since the eruption, the ash has spread at least 44 miles affecting more and more individuals. Volcanoes cannot be stopped after an eruption has started, so the idea of making the disaster less devastating begins to take action. Immediately after the eruption, non-profit organizations began to help lessen the impact in any way they could; they began helping residents evacuate unsafe areas while others started funds to help raise money for the recovery process. The recovery process of a disaster is a crucial component to the saving of lives or infrastructure and can make any disaster have less casualties or damage.

## **The EU's Emergency Response**

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### **Poster Presentation**

#### **ABSTRACT:**

The European Union is an organization made up of 28 different countries, all residing in or near Europe. It is known for its numerous times of ensuring that the citizens' rights are not violated, maintaining of common policies, and aid in times of need to name a few. In specific, this project will focus of it's emergency response efforts and supply aid across the globe. They have developed pre-packaged disaster kits and their models were used worldwide because of their accuracy. In addition, the project will highlight their testing and shipping of equipment as well as their their cost-reducing policies.

## **Norway's Evolving Emergency Management**

Caleb Woyt

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### **Poster Presentation**

#### **ABSTRACT:**

Norway was criticized for many years for having a lacking and inadequate emergency management program that led citizens to lose trust in their country's emergency programs. But when Norway was faced with a tragic terrorist attack in 2011 that left 77 people dead, it made officials take a look at their emergency planning and response capabilities. Since then, the Norwegian government has taken steps to improve their emergency management agencies and policies by introducing improved measures as well as increase funding for necessary resources. By including new technology and changing their emergency management model, the country has seen a huge improvement in emergency response capabilities. Now, Norway's emergency management officials spearhead joint emergency programs that include over ten countries and aim to assist one another in emergency planning/ response capabilities as well as establish an information sharing networks.

## **The Wave that Affected Millions**

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### **Poster Presentation**

#### **ABSTRACT:**

The 2004 Indian Ocean 'Boxing Day' Tsunami was the deadliest tsunami ever to be recorded to this day. The disaster cost a total of \$15 billion to fix and over 230,000 people lost their lives in fourteen different countries (Roos, 2018). With this project, I plan to research and analyze a few different aspects of this disaster. I plan to research what caused the tsunami, and how fast it affected the victims on the shore. I would also like to analyze the communication aspect, and how it may have failed to alert other countries that were affected after the first wave hit. I plan to report the dimensions of the waves and why it is the deadliest tsunami to date. The last thing I will analyze is the relief that was given to the victims. Was it fast or slow? How helpful was the system? Did it relieve victims or make their frustrations worse? Have the countries fully recovered from this tsunami sixteen years after it happened? All of these questions will be answered through this research project. All of my findings will aid me in analyzing how disaster relief and the emergency management system have been upgraded and changed to help victims of similar disasters today.

# MANAGEMENT AND MARKETING

## **eSports on Campus**

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### **Poster Presentation**

#### **ABSTRACT:**

When looking at the trend in society it becomes clear that without technology a lot of things would not function. ESports is part of the 21st century development of technology and popularity of eSport games.

In order to be able to analyze the impact of eSports on campus, a survey was given out to a total of 1104 students of the Slippery Rock University from different field of studies and the SRU eSports club. The goal was to find out if there is a connection between students' GPA and the average amount of eSports they play weekly. Furthermore, the study and research focusses on the possibilities that eSport could bring to the development and improvement of SRU students by seeking a better understanding of their attitudes, norms and behavioral intentions. Out of the 1104 survey receivers, 158 were started and 141 responses were collected. Of the 141 collected responses, 139 came directly from the email invitation and 2 via a shared link as the respondents had the chance to share the survey via the snowball method with other students and friends.

The first descriptive analysis shows that 76% of respondents are male, 21.5% are female and 2.5% prefer not to identify with a gender. Responses were collected from various field of studies such as Sport Management, Information Systems or Accounting. Furthermore, it was not restricted to only undergraduate students as also further education levels were included in the options.

The results of the research list the GPA of the respondents. Therefore, over 46% indicated that their GPA lies between 3.5-4.0. Only 6 respondents said that they currently have a GPA of 2.49 or lower. How are the habits, attitudes, and behavioral intentions connected to the GPA and the level of eSport involvement?

# MATHEMATICS AND STATISTICS

## **Mobile Website for Student Evaluations**

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### **Poster Presentation**

#### **ABSTRACT:**

SRU currently uses paper student evaluation forms which require many person-hours to scan, process, and distribute to faculty. In this project, we propose a more efficient and environmentally friendly alternative by developing an online service through which students can submit their professor evaluations by smartphone, computer, or another electronic device. Our mobile website uses server-side and client-side scripting to collect the same information as the currently used paper forms, and automatically aggregates, processes, and visualizes the responses. We compare our software to existing evaluation systems (including paper evaluations) based on accessibility, usability, anonymity, and security. We hope to establish an algorithm and website similar to that which Rate My Professor uses. The purpose of this project is to create a more efficient method of evaluating professors here at Slippery Rock University, based on their teaching effectiveness and student opinions. This will always allow professors to have access to this information and feedback, rather than having to process each evaluation individually in order to better themselves and the courses that they teach. This project will provide an interactive webpage designed to be user-friendly in the sense that it would be easy to operate and that the user would have full access to the evaluations and fellow students' opinions all in one location. It will allow for students to input the information about the course they are enrolled in and the professor teaching it, complete the evaluation form, and then the program will perform calculations based on the form and find a percentage rating that shows the effectiveness of each professor's teaching styles, based on the courses that they teach.

# OCCUPATIONAL THERAPY

## **Teachers' Perceptions of Student Readiness for Kindergarten Handwriting**

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### **Poster Presentation**

#### **ABSTRACT:**

This study investigates local kindergarten teacher's perceptions of their student's readiness for handwriting. The core curriculum for First Grade includes standards for writing that are heavily focused on the organizational patterns of sentences, language, and literacy techniques (Pennsylvania Department of Education, 2016a). Likewise, kindergarten teachers are expected to teach letter formation and development for children to be prepared for First Grade even though these standards are not included within the kindergarten core curriculum (Pennsylvania Department of Education, 2016b). The aims of this study are to understand the most prevalent difficulties related to handwriting in kindergarten, identify areas of occupational therapy that may facilitate the development of a child's handwriting abilities and understand kindergarten classroom dynamics that may have impact on student's development of handwriting skills. A 45-question survey was distributed to 10 kindergarten teachers from various Western Pennsylvania school districts to identify their perceptions of kindergarten readiness in handwriting and understand common difficulties observed in the classroom. Survey data was analyzed utilizing SPSS software. Descriptive statistics were utilized to determine teacher's perceptions of student readiness for kindergarten handwriting. The data analyzed the most common areas of difficulties among kindergarten students including fine motor skills, visual motor integration skills, and visual perception skills. More than half of the teachers recognize less than 50% of their students could form letters with appropriate sizing and four teachers recognize less than 50% of their students would write their name prior to starting kindergarten. A community-based occupational therapy intervention program targeting different areas of handwriting including fine motor skills, visual motor integration skills, and visual perception skills will benefit children prior to entering kindergarten and aid handwriting development.

## **Gauging Perceptions and Knowledge of Healthcare Professionals Regarding the Role of Occupational Therapy Intervention in Concussion Management**

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### **Poster Presentation**

#### **ABSTRACT:**

The purpose of the study was to gain information regarding healthcare professionals' thoughts and understanding of occupational therapy in concussion management, since occupational therapy treatment and intervention in this domain is scarce. Researchers hypothesized that healthcare providers' experience in treating concussions increases their level of comfort in working with clients who have sustained concussions. Additionally, they believed there would be a significant difference between years of experience and importance of interprofessional collaboration. An online survey was developed, using Qualtrics Insight platform, consisting of fifteen quantitative questions and two qualitative questions. Participants were a purposeful sample of certified healthcare professionals: occupational therapists (OT), occupational therapist assistants (COTA), physical therapists (PT), physical therapist assistants (PTA), and athletic trainers (AT), who currently practiced within their U.S. state of licensure. Participants were at least 18 years old and participated on a voluntary basis. A survey link was emailed to two healthcare professionals from Slippery Rock University's Doctor of Occupational Therapy program, and through snowball sampling, they supplied referrals to other healthcare professionals across the United States. Participants were allotted four weeks to complete the survey. Following the four weeks, researchers received a total of 40 completed surveys. A total of 19 responses were received from PT, 14 from OT, and seven from AT. Statistically significant results were found supporting healthcare providers' years of experience and comfortability in treating individuals who sustained concussions. The relationship between healthcare professionals' years of experience and importance of interprofessional collaboration did not yield statistically significant results. Targeting patients' "cognition, memory, and balance" was the most common intervention strategy for treatment of concussions through an interdisciplinary approach. Results from the study yield new educational and advocacy opportunities for future implications. Additionally, results can enhance both effectiveness and validity of interdisciplinary practices.

## **Teachers' Perceptions on Scheduled Breaks and Students Behavior**

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### **Poster Presentation**

#### **ABSTRACT:**

The purpose of this research study was to examine what types of scheduled breaks are provided to students and the impact of classroom breaks on students' behavior. A 34-question survey instrument was produced by researchers to examine what types of breaks are provided throughout the school day, how scheduled breaks affect students' behavior, and occupational therapists' role in structuring classroom breaks. Permission for participant recruitment was received by five elementary school principals in Western Pennsylvania. Purposeful sampling was then used to contact 140 elementary school teachers at participating schools. Participants' informed consent was required in order to access the electronic survey link. Inclusion criteria consisted of teachers who taught at least one general education class in a grade second through fifth, with at least one year of prior teaching experience. A total of 17 surveys were returned, however, only eight met criteria to be included in the study. Utilizing Statistical Package for the Social Sciences Version 25 (SPSS-25) and Microsoft Excel, data was analyzed using descriptive statistics, consisting of frequencies and percentages. Study results indicated that eight teachers reported providing scheduled breaks throughout the school day. The most frequently reported scheduled breaks were recess (88%), guided stretching (75%), and listening to calm music (63%). Additionally, the most frequently reported student behavioral outcomes were enhanced mood and increased time-on-task. The results from this study demonstrate a clinically significant correlation between scheduled classroom breaks and student behavioral outcomes. Further research is needed to understand if teachers are intentionally designing scheduled breaks to include sensory components. Therefore, it is important to consider the value of occupational therapists collaborating with teachers on designing and implemented scheduled activity breaks.

## **The Role of Occupational Therapy Treatment for Infants Born with Neonatal Abstinence Syndrome**

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### **Poster Presentation**

#### **ABSTRACT:**

This study aimed to investigate if occupational therapy was routinely providing a nonpharmacological intervention options for infants born with neonatal abstinence syndrome (NAS) in the Neonatal Intensive Care Unit (NICU), as there are limited findings to support their direct role with sensory integration interventions for this population. The role of an occupational therapist introducing infants with NAS to environmental stimuli and providing therapeutic interventions can be extremely beneficial in decreasing significant effects of the syndrome (Schaaf, Dumont, Arbesman, & May-Benson, 2017). A qualitative study was designed to survey NICU nurses from two hospitals, University Hospitals Rainbow Babies and UPMC Magee Women's Hospital, in the Pennsylvania and Ohio areas. Full-time nurses who had at least one year of experience working in the NICU were eligible to participate in the study. The participants were chosen based on convenience sampling. The survey consisted of 28 questions using a variety of styles such as a five-point likert scale and open-ended response questions. The questions highlighted the NICU environment, treatment of infants born with NAS, and sensory input. Data was collected through Qualtrics and exported to Statistical Package for Social Sciences- Version 25 (SPSS). Descriptive statistics was used to interpret the quantitative data and the qualitative data was analyzed by extracting themes. There were 28 total responses, however 16 surveys met the qualifying criteria to be analyzed. Overall, the findings supported the research that infants born with NAS in the NICU are overstimulated and occupational therapists are not routinely ordered in their care. Despite these results, more information from a larger sample size and population needs to be gathered to fully support this study.

## **Occupational Therapy Interventions with Clients Who Acquire an Amputation**

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### **Poster Presentation**

#### **ABSTRACT:**

Currently, there is a limited number of occupational therapists who actively practice and specialize in prosthetic training and amputation management. There is a gap in clinical practice and research regarding occupational therapy services, amputations, and prosthetic training. A mixed study was utilized to focus on the role of occupational therapy (OT) in upper and lower extremity limb amputation management, as well as prosthetic training. The main purpose of this study was to determine why there is such a lack of research in this area of practice and to highlight the importance and need for occupational therapy services in prosthetic training and amputation management. A brief survey utilizing both qualitative and quantitative questions was distributed to occupational therapists and occupational therapy assistants. Researchers received a total of 30 completed surveys. Outcomes from the survey revealed that participants treated more clients who acquired a lower extremity amputation, compared to an upper extremity amputation. The lack of experience in prosthetic training and amputation management was yielded as the largest barrier when working with this specialized population. The research study is significant to the field of occupational therapy, advocating for occupational therapy to have a specific and focused role when working with amputees. Continued education, advocacy, and experience will help to improve the role of OT in prosthetic training and amputation management.

## **The Impact of Stress on Individuals with Autism Spectrum Disorder Who are Seeking Employment**

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### **Poster Presentation**

#### **ABSTRACT:**

The purpose of this study is to discover the perceptions of individuals with mild or moderate diagnosis of Autism Spectrum Disorder regarding the impact stress creates on their confidence in gaining employment. Current research highlights a relationship between stress and decreased job procurement for individuals with Autism Spectrum Disorder (Wehman et al., 2014). Walsh, Holloway, and Lydon (2018) revealed stress as a leading inhibitor of inadequate job acquirement abilities for adults with Autism Spectrum Disorder. Only four to 12 percent of adults with mild to severe Autism Spectrum Disorder have a job (Wehman et al., 2014). Many of these individuals have received sufficient job-related training from vocational programs to prepare for future careers (Hendricks, 2010). However, vocation programs currently do not incorporate stress management education into their curriculum (Wehmen et al., 2014). An electronic survey developed for data collection was created based on evidence from the literature review to address the gaps in research. Participants were gathered through a convenience sampling. Seven participants from Glade Run Lutheran Transition Services completed surveys. Survey outcomes were measured using yes/no, 5-point Likert scale, open-ended, and select all that apply questions. Data was analyzed using Statistical Package for the Social Sciences (SPSS) software, version 25. Pearson's chi-square test was utilized to support hypotheses one, two, and three to determine the relationship between categorical variables. Codes and themes were developed by the co-investigators to analyze the qualitative data obtained. Results showed there was not a statistical significance between individuals with mild to moderate Autism Spectrum Disorder and stress and employment. Codes and themes from qualitative data were determined to be clinically significant. Additional qualitative research is needed to discover the linkage between stress and employment for individuals with Autism Spectrum Disorder.

# PHYSICAL AND HEALTH

# EDUCATION

## **Overcoming the Fear of the Deep End: Swimming Lessons for an Individual with Epilepsy**

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### **Poster Presentation**

#### **ABSTRACT:**

Individuals with epilepsy have a tendency to fear participating in an activity because they could have a seizure (Arida et al., 2010). When an individual with epilepsy enjoys the activity they are participating in, the fear will melt away and give them the confidence to continue pursuing that activity. This study was done to teach two swimming skills to a participant with epilepsy so he will have the confidence to swim in the deep end with no assistance. The method of the study was a single subject design with one male participant. The participant was taught how to breathe while swimming and treading water to build confidence in his swimming ability. The results were that he was nervous at the beginning of the intervention but once he was taught the skills and he built up the confidence he was able to swim a longer distance in the pool. Once the intervention was over the participant still had the ability to swim in the deep end by himself. When an individual builds up the confidence to participate in a physical activity that originally scared them, they have the potential to crush their fear.

**Keywords:** Epilepsy, Adaptive Aquatics, Single Subject Design, Confidence, Swimming Skills

# PHYSICS AND ENGINEERING

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## Photovoltaic Glass

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### Poster Presentation

#### ABSTRACT:

For generations we as a community have struggled to find a sustainable solution to the energy crisis. Oil prices are rising, wars are raging, and resources are running out. The global community has placed great emphasis on renewable energy. However, many forms of energy production have shown to be inefficient or difficult in managing cost. Up to this point solar energy has proved to be the most successful and widely known form of renewable energy, with a primary downside of taking too much space to be profitable. Solar photovoltaic (PV) glass generates electricity, and negates this major issue. This product is applicable in the use of glass windows available to the public. For example, the auto manufacturer Audi has made investments to incorporate this product into their vehicles in an attempt to be self sufficient. Photovoltaic glass is an important stepping stone towards a society no longer dependent on crude fossil fuels, and allows everyone access to clean renewable energy without the worry of another energy crisis.

# POLITICAL SCIENCE

## **Racial Disparities in Women's Health in the United States**

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### **Poster Presentation**

#### **ABSTRACT:**

In the United States, the quality of healthcare that women receive varies depending upon race, socioeconomic status, and location. Black women face more complications related to pregnancy than White women on average. We have a long history in the U.S. of neglecting women that are most at risk for a pregnancy complication. To solve this disparity among women, future policy makers and doctors alike will have to take a hard look at what is happening to these women. Our poster will outline the disparities within women's health including maternal mortality, infant mortality, prenatal care, and life expectancy. It will describe the pathways that lead to racial disparities in women's health and then provide policy alternatives that address those causes. Our strongest recommendation and conclusion is racial disparities cannot and will not be diminished without reformation of the United States healthcare system.

## **The Impact of Incarcerated Parents on the Black Family**

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### **Poster Presentation**

#### **ABSTRACT:**

The war on drugs has been a failure that has ruined lives, led to mass incarceration, and cost over a trillion dollars. People of color, especially Black Americans, have been disproportionately stopped by police, cited, arrested, and convicted during this period and are now six times as likely to be incarcerated as whites. Mass incarceration has inflicted severe harms on the Black family and especially Black children with incarcerated parents. Statistics show that over half of incarcerated people are parents. Having an incarcerated parent is shown to have adverse effects on the well-being of the child in the areas of school behavior and performance, future criminal involvement, physical and mental health, social support, and family relationships. The impacts of having an incarcerated parent are varied and specific to each family. However, when comparing by race, Black families and children are more often and more harshly affected than their white counterparts. After addressing the scope and severity of the impacts on Black children, we have come up with six policy recommendations to mitigate the effects of parental incarceration. We further used analogous reasoning (drawing on creative policy responses to the opioid crisis) to develop an innovative model of policy coordination among service providers involved in the lives of families with an incarcerated individual. Our approach calls for an early warning system model for children of incarcerated parents that requires coordination among multiple government entities including jails and prisons, courts, schools, and children and youth services. These institutions can serve as intervention points to mobilize services for children of incarcerated parents who show signs of distress.

# PSYCHOLOGY

## **The Relationship Between Peer Influence and Delinquent Behavior**

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### **Poster Presentation**

#### **ABSTRACT:**

The purpose of this study was to examine the relationship between peer influence and delinquency in adolescence. Data from the public use dataset from Wave 1 of the National Longitudinal Study of Adolescent to Adult Health (Add Health) were analyzed. The public use dataset included 6,504 participants (51.6% female; 48.4% male) all in grades 7-12. Peer influence was measured with two variables: a question about whether participants felt peers would respect them more if they had sex, and a question about how frequently they had been involved in group fights. Delinquency was measured with 15 items asking how frequently participants had been involved in delinquent acts ranging from “being rowdy in public” to more serious crimes such as burglary, threatening others with a weapon, or selling drugs. The average response to these 15 items was the dependent variable in two analyses; in the third analysis, responses to the item about selling drugs were the dependent variable. A One-Way ANOVA, Chi-square, and a Pearson correlation analysis were conducted to examine the relationship between peer pressure and delinquent behavior in adolescents. The results revealed a significant relationship between peer influence and delinquency generally (as measured by the average of all 15 items) and a significant relationship between peer influence and a specific form of delinquency, selling drugs. These results are consistent with findings of prior studies, which showed that adolescents are more likely to engage in delinquent behavior if they feel the need to conform or gain respect from their peers.

## **The Association Between Parent-Child Closeness and Fighting with Use of Weapons**

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### **Poster Presentation**

#### **ABSTRACT:**

Existing research shows that several aspects of parent-child relationships predict the amount of delinquency in adolescence (Muftic & Updegrave 2018; Simmons et al. 2018). Several types of delinquent behavior have been studied, including substance use/abuse, property offenses, and aggression, but few studies have examined fighting and use of weapons. Specifically, fighting and weapon use have not been examined with respect to feelings of closeness to parents. This study examined links between parent-child closeness and fighting. The hypothesis was that adolescents who felt less close to their parents would report more physical fights and fights involving weapons, such as guns and knives. The sample used was the public use dataset from Wave I of the National Longitudinal Study of Adolescent and Adult Health (Harris et al. 2009), which includes 6,504 participants (51.6% female) in 7th–12th grade. Parent-child closeness was measured with four questions about adolescents' closeness to, and caring from, their mother and father. Fighting was measured by three questions about the adolescents' involvement in fights. Three statistical analyses, an ANOVA, a chi-square test, and a Pearson correlation, were conducted. All analyses revealed a significant association between parent-child closeness and involvement in fighting and use of weapons. For example, the chi-square test indicated that participants who reported low closeness to parents were more likely to be involved in fighting (34.8%) than participants who reported high closeness to parents (26.6%). The results of the inferential tests support the hypothesis that there is a relationship between low parent-child closeness and more involvement in physical violence. These results add to the existing literature, by showing that parent-child closeness, as well as parent-child communication and parenting styles, can affect a child's behavior and delinquency.

## **Assessing Thinness Orientation**

Destiny King, Emily Keener, Mikaila Leonard, Amanda Reichert

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### **Poster Presentation**

#### **ABSTRACT:**

The goal of this pilot project is to test the validity and reliability of new items designed to assess thinness orientation, which we hypothesize is one of many dimensions of body image. Existing scales are inadequate and there is a need for a new measure. By testing our new items against existing assessments, we will be determining whether our items can be used in future research as a valid and reliable instrument. To do so, participants (n= 351) were recruited from psychology classes and completed the following scales: 1) Eating Disorder Inventory-3 (Garner, 2004), 2) Eating Disorder Examination Questionnaire (EDE-Q) Fairburn & Beglin (2008), 3) Thinness Orientation Scale (Developed for the present study), Drive for Leanness Scale (Smolak & Murnen, 2008), 4) Drive for Muscularity Scale (McCreary, Sasse, Saucier, & Dorsch, 2004), 5) Body Shape Questionnaire (Evans & Dolan, 1993), 6) Conformity to Masculine Norms Inventory (Parent & Moradi, 2009), as well as 7) a short demographic survey. To test the hypothesis that thinness orientation is unique of body image, we will conduct correlation analyses. Doing so will determine whether our new scale has convergent and divergent validity. More specifically, for convergent validity, we will test whether there is a moderate to strong positive correlation with the other scales assessing body image. For divergent validity, we will test whether the variable is unrelated (or weak correlation) to variables that it should not be related to, such as age and conformity to masculine norms. Results will be discussed in terms of whether the hypothesized measure has the psychometric properties needed to be used in future research.

## **Observations of Educational and Non-Educational Interactions in a Museum Setting**

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### **Poster Presentation**

#### **ABSTRACT:**

Developmental psychologists are increasingly interested in examining how children learn in a variety of social contexts. Museum exhibits are often designed to promote interaction with materials and prompt conversations to support learning. Such exhibits support a variety of informal interactions between parents and children (or even between children) that may affect what children learn from the exhibit. In order to gain scientific observational skills, students observed such interactions at the Carnegie Science Center in Pittsburgh and coded aspects (e.g., frequencies) of these interactions.

This poster describes a project conducted as part of a non-credit seminar (DeVenture – Developmental Enrichment Venture) for students in the Psychology Developmental Concentration. Students are learning naturalistic observation skills through the process of operationalizing variables and developing a coding scheme and instrument related to parent-child interactions at the Museum.

Students conducted two 3-hour observation periods at the Carnegie Science Center in November 2019. Every student observed the Sun, Earth, Universe exhibit and used the standard coding sheet we created to record several aspects of interactions: the apparent gender and estimated age of the child and the adult, whether an adult views or interacts with the station together with the child or child interacts alone, whether an adult is present with multiple children, and the extent to which engagement with the station involves non-educational (e.g., running, rapidly switching between stations, and playing with others with no interest in station) or educational interaction (e.g., focused interaction with the station, sustained interest in the station, and appropriate physical interaction with station). No observations involved direct interaction with adults or children and no identifying information about observed individuals were recorded. The observations from both visits to the museum will be analyzed to provide a description of common interaction patterns.

# PUBLIC HEALTH AND

# SOCIAL WORK

## **Analyzing the Mental Health of Caretakers**

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### **Oral Presentation**

#### **ABSTRACT:**

The purpose of this paper is to look into how dealing with individuals with a mental illness may have an effect on the mental health of those that are responsible for looking after those individuals. Taking a moment to acknowledge all that caretakers do, there has to be a point of realization to observe the toll that it may take on those individuals with having so much to do. The daily routines, the schedule adjustments, the sacrifices, the difficulty, the stress, the expenses, the judgement, and the misunderstanding of being in this situation can truly be strenuous on caretakers that isn't really being discussed. Understanding that the focus should be on those affected by the mental diagnoses, there should also be a focus on the individuals that take on that responsibility on a daily basis. The goal of this paper is to not only find support that acknowledges this topic but to find ways of addressing this issue and reducing this problem for caretakers.

To get a better understanding of this question, there will be a survey administered to willing participants to get an idea of how they are affected by being in this situation. The survey will be used to determine how caretakers personally feel about the topic, and what ways they have seen the topic addressed or not addressed. Along with that point, ideas of implementation that can potentially improve these conditions will also be determined by the survey. Once the information from the surveys is collected, one could expect the results to show that although the caretakers believe that their mental health being affected is a thing, it is seldom acknowledged, and that it is something that they wished was more widely addressed.

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